JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

OFFICE OF INDUSTRIAL ECONOMICS,
MINISTRY OF INDUSTRY
THE KINGDOM OF THAILAND

THE STUDY
ON
THE MASTER PLAN FOR THE INDUSTRIAL DEVELOPMENT
IN THE PROVINCIAL CLUSTER OF
NAKHON RATCHASIMA, BURI RAM, SURIN AND CHAIYAPHUM
IN
THE KINGDOM OF THAILAND

(SUMMARY)

JUNE 2000

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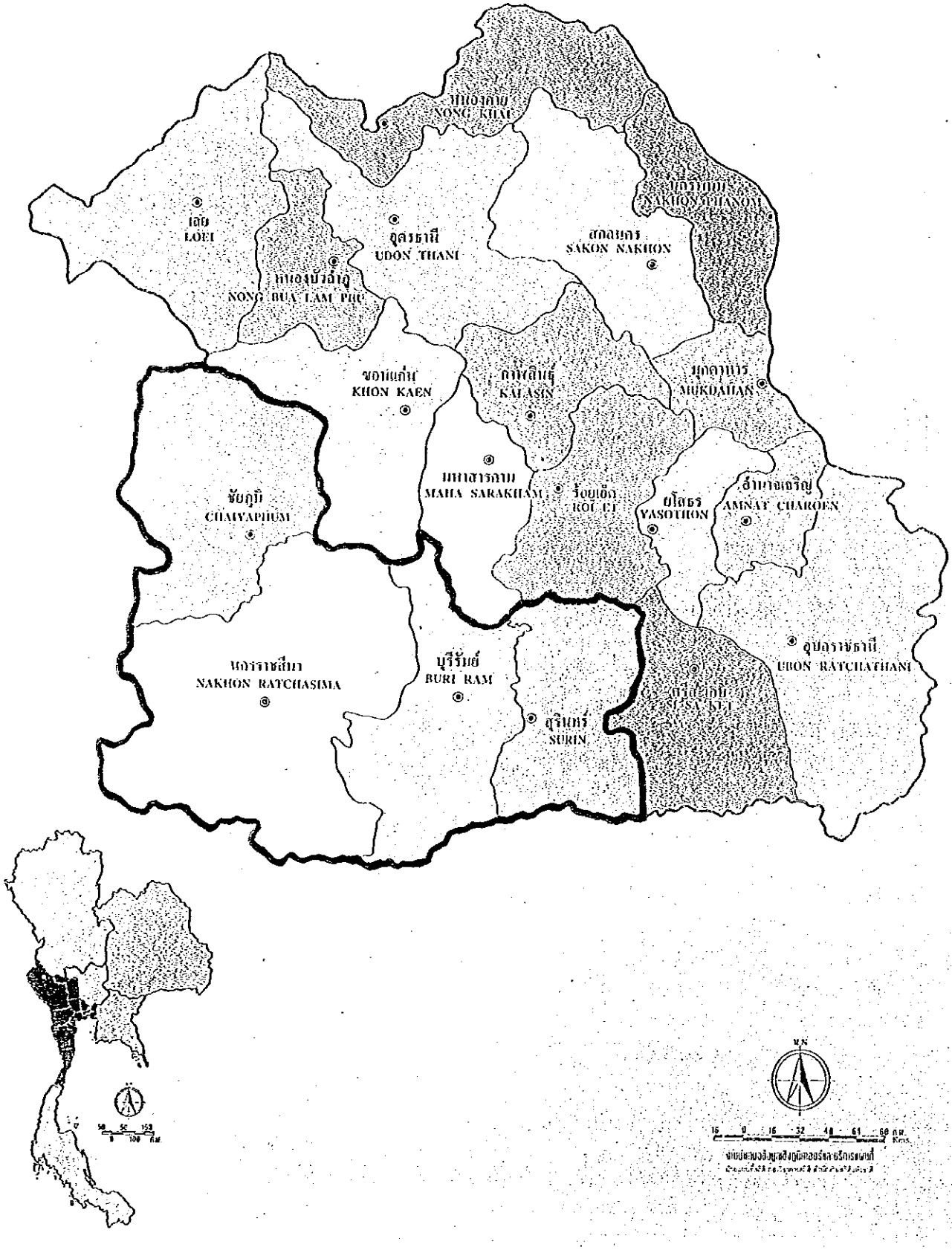
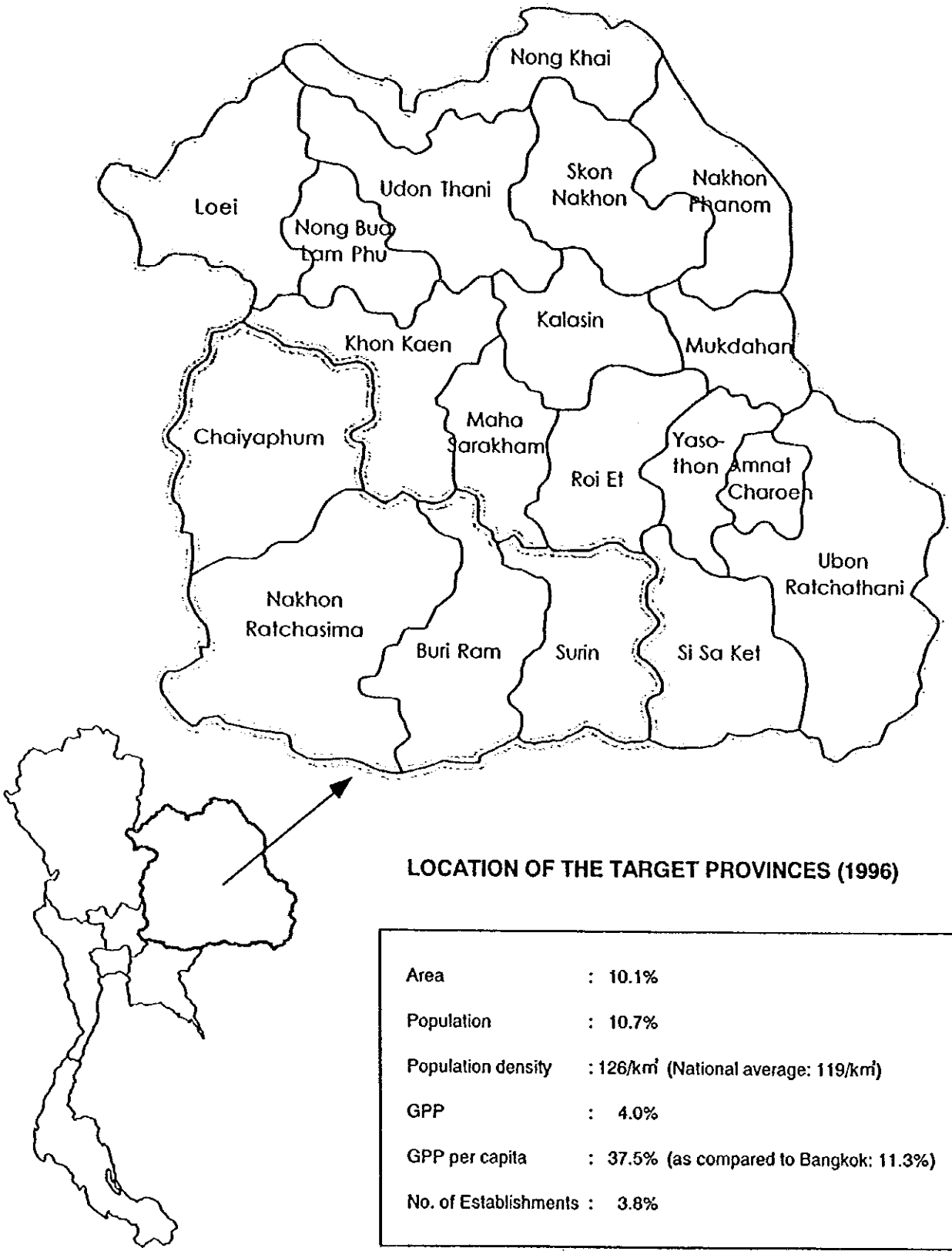
แผนที่ภาคตะวันออกเฉียงเหนือแสดงขอบเขตจังหวัด

MAP OF NORTHEASTERN REGION SHOWING CHANGWAT BOUNDARIES





LOCATION OF THE TARGET PROVINCES (1996)

Area	:	10.1%
Population	:	10.7%
Population density	:	126/km² (National average: 119/km²)
GPP	:	4.0%
GPP per capita	:	37.5% (as compared to Bangkok: 11.3%)
No. of Establishments	:	3.8%

CONTENTS

EXECUTIVE SUMMARY

1. Core Problems Confronting Industrial Development

The selected core problems and specifying direct causes at workshop in each province are as follows;

Key issues and direct causes	
Key issue for Nakhon Ratchasima: **"Local products are not competitive"**	
Direct causes:	a) Poor marketing capability
	b) High production cost
	c) Insufficient production skills
	d) Non-compliance of product quality with international standards
	e) Insufficient government support for R&D activities
	f) Failure to use appropriate technology
Key issue for Buri Ram: **"Entrepreneurs lack knowledge to develop existing or new business"**	
Direct causes:	a) Entrepreneurs cling to traditional business style.
	b) Lack of opportunity to learn new knowledge
	c) Lack of effective government support
	a) Entrepreneurs are unable to find industrial information.
	c) Entrepreneurs are not interested in learning management know-how with their own efforts.
Key issue for Surin: **"Entrepreneurs lack sufficient knowledge and understanding of industries they are operating"**	
Direct causes:	a) Entrepreneurs are unable to find industrial information.
	b) Lack of experts on specific subsectors
	c) Local people do not know the way to learn management know-how.
	d) Local people are not willing to learn new knowledge.
	e) Entrepreneurs do not want to cooperate with each other.
Key issue for Chaiyaphum: **"Lack of coordination between the public and private sectors"**	
Direct causes:	a) Chaiyaphum's industrial development plan does not show a clear direction.
	b) The government does not motivate investors.
	c) There is no one-stop source of obtaining information on local conditions and investment procedures.
	d) Entrepreneurs are reluctant to cooperate with each other.

Among the direct causes identified above, largest in number are classified to the field of human resource development, followed by four items each related to production/process technology and investment promotion. In contrast, there is no item related to finance and infrastructure. This is because these factors are indirectly related to the industrial development process. It should be noted that four items (direct causes) related to production/process technology were all identified at the Nakhon Ratchasima workshop, reflecting the fact that the province is most advanced in industrial development among other provinces. This means, these items are not considered as direct causes commonly seen in the four provinces.

Next, under the present study, the study team has identified major issues in the study area (provincial cluster), which can be summarized according to the major study item as follows.

(1) Machinery and electric/electronics industries

Productivity improvement for the machinery industry and the fostering of the supplier base for the electric/electronics industry; and the strengthening of marketing capabilities and the raising of awareness of management and work force for industrial modernization.

(2) Farm product processing

Modernization of processing techniques for value added products and the strengthening of marketing capabilities

(3) Work force and human resource development

Most owners and managers of local enterprises do not have sufficient knowledge to analyze the problems they are facing. They also lack clear visions for future management. The major issue here is the lack of entrepreneurship in rural areas.

(4) Local/traditional industries

Improvement of quality and design; the strengthening of the ability to develop new markets; and innovative organizational efforts to reinforce the industry base.

(5) Industrial infrastructure

Construction of high-grade road networks and the upgrading of industrial water supply systems

(6) Financial service for SMEs

Modernization of management practice; preparation of financial statements; and the enhancement of a micro-finance system for microenterprises and family industries.

(7) Investment promotion and industrial estate

The lack of information required for investment decisions; and the shortage of budget and manpower for investment promotion activities.

Furthermore, there are several higher-ordered issues, as pointed out during the workshops, which are considered to govern the presence and magnitude of the above issues. They include the absence of strong leadership capable of taking initiative in the regional industrial development process, and the immature and inadequate development organization and resources. Thus, **the development of human resources responsible for the regional development and the mobilization of resources including the organizational setup should be given of the highest priority.**

2. Development Direction and Priority Industries

In devising a fundamental strategy for promotion of industrial development in rural areas of Thailand, it was assumed that the promotion process can be implemented most effectively by combining two approaches: (1) "extraneous regional industrial development" based on attraction of industries and technology transfer from the outside; and (2) "spontaneous regional industrial development" driven by local resources, people and their initiatives and innovative efforts. The field survey and analysis revealed that this two-pronged strategy would be applicable and feasible in each of the target provinces.

In fact, the strategy serves as a common element of development planning for the target provinces. Take Nakhon Ratchasima and Surin, for instance. At a first glance, different approaches should be adopted for the two provinces which differ significantly in industrial structure, characteristics of people, and the needs and requirements for effective promotion of industrial development. However, it soon becomes apparent in the planning process that both extrinsic and intrinsic approaches are essential in implementing the industrial development process with sufficient breadth and depth to benefit the entire province. Within this framework, each province should be able to design the composition of two approaches, i.e., which approach should be emphasized over the other.

(1) Strategic Direction of Provincial Development

1) Strategic Direction and basis of proposal for Nakhon Ratchasima

Strategic direction of development: **To upgrade and reinforce the local industrial base.**

Basis of proposal: In Nakhon Ratchasima, a variety of industries have been growing steadily and form industrial centers, consisting of traditional silk and ceramics industries, and more recently, machinery, metalworking and the agro-processing. Then in the 1990s, new industries have emerged, including electric and electronics and automotive parts. Nevertheless, its industrial base, seemingly broad-based, has a major weakness in the apparent lack of depth, i.e., no industry contains the complete process within the province, from downstream to upstream. Furthermore, most manufacturing enterprises, except for some joint ventures having foreign partners, exhibit weakness in market development and production management capabilities (including human resources). The industrial vulnerability is substantiated by the central issue agreed at the workshop, i.e., "lack of competitiveness of local industrial products." Yet, the province is a highly attractive place for various industries, with abundant resources including farm products, mineral resources, and human resources, together with availability of low land, labor and other costs. Also, its strategic location as a regional hub will help develop the province to a major industrial centers in the future industrial development process. In consideration of the above strengths and weaknesses, the strategic direction of the province's industrial development

should focus on further upgrading and strengthening of the existing industrial base with a final goal to become a regional industrial center.

2) Priority industries for accelerated promotion

a) **Electric and electronics industry**: Fostering of supporting industries including suppliers and machining shops
b) **Food processing industry**: Evolution from agro-processing to food processing
c) **Machinery and metalworking industries**: Integration to the parts supply industry
d) **Local resource-based industries**: Revitalization of traditional industries such as silk and ceramics

3) Strategic direction and basis of proposal for Buri Ram

Strategic direction of development: **Development of an international fashion brand center**

Basis of proposal: Buri Ram is similar to its neighboring province, Surin, in terms of industrial structure and characteristics of people. For this reason, JICA's report in 1993, entitled "Comprehensive Development Planning Study of Southern Part of Northeast Region and Northern Part of the Eastern Region of Thailand," proposed the twin city (Buri Ram/Surin) scheme which extended over the two provinces. Nevertheless, as widely recognized at the workshop, particularly the central issue for industrial development, the major obstacle is considered to be the lack of relevant knowledge and willingness among local people.

Despite the disadvantage, Buri Ram has higher potential for industrial development than Surin does, as measured by a set of preconditions to attract industries. In particular, the fact that international companies having renowned brands (e.g., Nike, Pierre Cardin, Timberland and Bata) produce their products in the province suggests one direction of future development, although they are "footloose type industries" attracted by low production costs. While the strategy to diversify industrial production using local resources (e.g., rubber and eucalyptus) seems to be a viable option, the

province does not have much human resources familiar with production technology and business management. To promote industrialization under these circumstances, attraction of outside investment is considered to be an effective measure in the short- and medium-term. Extrinsic force will not only help expand the size of industrial activity in the province but will promote the change in the mindset of local people, thereby leading to the next stage of industrial development. In conclusion, the strategic direction of development is to attract more international brand companies so as to form a cluster which can be used as a show window to promote industrial presence in and outside the province, albeit they may not operate on a permanent basis.

4) Priority industries for accelerated promotion

a) **Apparel industry:** Attraction of apparel manufacturers, particularly those of brand products
b) **Light industries:** Modernization of leather and woodwork manufacturers
c) **Local resource-based industries:** Business diversification

5) Strategic direction and basis of proposal for Surin

Strategic direction of development: **To establish and promote the industrialization**

Basis of proposal: As seen in Buri Ram, the major problem facing industrial development in the province is related to the mindset and awareness of local people. As 90% of all households are involved in agriculture, they do not understand work ethics and rules related to modern industry operated under a detailed plan and management. In addition, local entrepreneurs do not have knowledge or awareness required to start a business in a particular industrial field. Most people in the province still follow the traditional way of thinking and lifestyle which are closely associated with agriculture and the natural environment. Integrated efforts are therefore called for to turn their attention to industrial operation and understand the way of thinking and lifestyle accompanying the modern industrial society.

Nevertheless, it is the fact that Surin has relatively small comparative advantages that can serve as the starting point for industrial development. Abundantly available resources are limited to jasmine rice, while silk, rattan and wood are not widely distributed. As for infrastructure, the province lags behind Buri Ram. Under these conditions, it is difficult to attract outside investment, including footloose type industries which are looking for low production cost. Thus, the province is handicapped in promoting industrial development by applying the extrinsic approach.

At the same time, however, that the province is expected to face increasing pressure to foster non-agriculture industries. The traditional monoculture economy depending on rice is threatened by cheap rice imported from Vietnam, which starts to undermine the economic base of the province. Despite the limited advantages for industrial development, therefore, the province has no choice but commit itself to promotion of the manufacturing industry in order to control economic downturns and secure future growth. For this reason, the strategic direction of development is described as the starting point to industrialization.

6) Priority industries for accelerated promotion

1) Agro-processing/food processing: Food processing based on rice and tapioca
2) Resource-based industries: Silk, rattan, bamboo and leather products

7) Strategic direction of development and basis of proposal for Chaiyaphum

Strategic direction of development: **Industrialization based on chemistry and agriculture**

Basic of proposal: While the province's economic base is agriculture like Buri Ram and Surin, many people in the province go abroad for work and send money to their homes so that its income level is relatively high. Various industrial development efforts are being made but are not very active. Rather, people in the province are generally reluctant to industrialization. This was supported by discussion at the workshop.

During the issues analysis, many people blamed others for a slow pace of industrialization, indicating their disappointment from previous attempts.

The province is endowed with farm products including rice, cassava and sugarcane. However, the majority of farm products is processed in Nakhon Ratchasima. Also, these farm products have limited applications for industrial purposes, except for tapioca starch. Mango and other fruits are only bottled and no advanced processing is made. As for mineral resources, potash ore is excavated in Bamnet Narong, south of the province and its processing plant will be constructed. Near the potash mine, rock salt deposits are available. Thus, there are various chemical materials including byproducts from the processing of the above minerals. Finally, MOI plans to lay natural gas pipelines from the Eastern Seaboard. Once they are completed, the province is ready to develop the chemical industry. As the government intends to relocate chemical plants in and around Bangkok to rural regions, it is a realistic option to attract them to the southern area of the province.

In promoting the chemical industry, environmental consideration will be required to protect extensive farmlands and forests in the province. Research efforts are required to develop processing technology to use farm products as well as the treatment of waste from the food processing industry. Also, public guidance and technology transfer are important to accomplish the goal of advancing from primary to secondary processing, or from agro-processing to food processing. For instance, the ethanol processing project based on tapioca starch is one of potential projects. These partially involve the chemical process. Thus, the chemical industry contemplated here covers a diverse range of processes and products.

8) Priority industries for accelerated promotion

a) **Chemical industry**: Chemical industry derived from potash
b) **Textile industry**: Diversification of the textile industry using traditional sewing techniques
c) **Food processing industry**: Development of new areas of food processing

(2) Direction of Regional Industrial Development

The strategic direction of the region's industrial development envisaged in this study should embrace the directions of development for the four provinces. More precisely, the strategic direction for the region represents a common goal for all the provinces and should be aligned with development efforts to be made by the individual provinces (see Figure 1). The strategic directions for the Nakhon Ratchasima Provincial Cluster is described below:

Strategic Development Direction for the Provincial Cluster:

"Development and vitalization of industrial strongholds in Northeast"

- Development Concept: **"Creation of Green-Technoland" –**

At present, Nakhon Ratchasima is only one province in the region, which have some industrial bases. They will be used as the core of a future industrial center in the region as well as Northeast. Promotional efforts will include modernization and revitalization of traditional industries, such as agri-processing, textile and ceramics, which are lagged behind and lose competitiveness. As the Thai government sets priority to the correction of regional disparities, the target provinces can capitalize on the opportunity by leveraging their geographical advantage as the hinterland of the major industrial zones in the BMR and the Eastern Seaboard region. Their comparative advantage should be used as a major impetus for promoting new and existing industries.

Industrial development in the provincial cluster will primarily take place along National Highway No. 2 where some industrial concentration is observed, then three highways crossing the region, namely Nos. 226, 24 and 201. In particular, the area along Highway No. 24 has high potential for tourism and industrial development needs to proceed under the principle of harmonizing industry and the environment, thereby to maintain a positive image of the entire region. That is creation of "Green-Technoland" where coexist with Agriculture, Tourism and Industry.

Some of traditional industries that are scattered in the region, mainly farm product/food processing, have local sources of raw materials and markets for their products. As they operate independently in each locality, development efforts to link their operations are not likely to produce tangible benefits. On the other hand, textile and ceramics industries can be fostered by designating the nuclei of development, such as Pak Tong Chai and Dan Kwen, and by concentrating marketing and education/training functions in them to centralize information resources for shared use and establish a local brand for the entire region (provincial cluster).

In addition, efforts to foster the inter-industrial linkage for the electric/electronics, automotive parts and machinery industries should go beyond the provincial cluster to Bangkok, Easter Seaboard, and foreign markets. In other words, these industries should be specialized in particular processes as part of the entire production system that extends throughout the country.

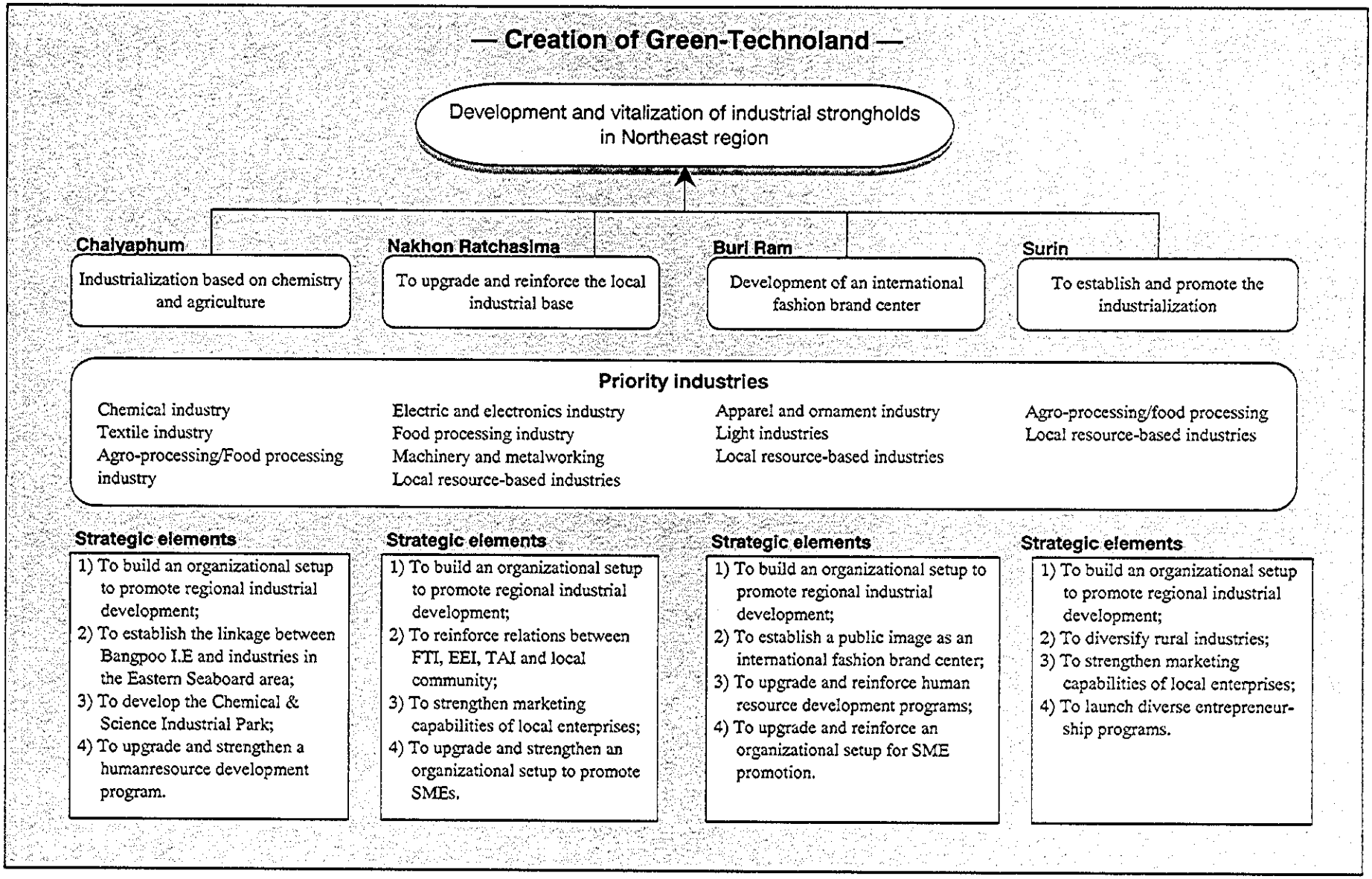


Figure 1. DEVELOPMENT DIRECTION & STRATEGY OF NAKHON RATCHASIMA PROVINCIAL CLUSTER

3 Structure of the Action Plan

As the action plan for promotion of industrial development (particularly SMEs) in the target region, finally, 38 projects/programs were selected (see Table 1) and 10 proposals (Project No. 1 through 10) which received high scores in the evaluation are attached as the Annex to the main report.

While this study deals with industrial promotion of the four provinces including Nakhon Ratchasima, many of the proposed projects/programs are applicable to other regions or areas; they can be customized to a particular region or area by taking into account local conditions peculiar to each area.

The 38 projects/programs are proposed for future implementation or detailed planning/design. They are classified into the following three types according to their relationship with existing projects: (1) those which capitalize on or utilize existing projects; (2) those which are based on projects that have previously been considered; and (3) those which are newly proposed under this study. As shown in Table 2, new projects account for nearly one half. Needless to say, existing projects and those which have been considered have high levels of need and/or viability, and these factors have been taken into consideration in the evaluation process. Importantly, existing projects are proposed with the intent to reinforce them in terms of viability and effectiveness. For instance, the PRID program is budgeted until March 2001 and no plan is specified afterwards. The study proposes the program to extend not only its duration but its geographical coverage.

A leading part in the proposed projects/programs in the institutional build-up and human resource development for regional industrial development. Though all projects/programs take considerable time to start up and require long-term responses, they are requested as a project that should be started as early as possible. In view of operational realities when some of the projects are in the same supporting field or implemented by the same body, they may be started at different times.

Among the proposed projects/programs, the following nine projects can be implemented by the private sector alone or under its leadership. It is

recommended that a local FTI or the chamber of commerce take initiative in cooperation with related organizations.

- Project 5 Introduction of Top Executive Seminar Program
- Project 8 Promotion of Two Step Contract
- Project 12 Establishment of Nakhon Ratchasima international School
- Project 13 Development of Entrepreneur Fostering Programs (EFP)
- Project 20 Establishment of International Flight Company
- Project 23 Establishment of a Brand Fashion Outlet Center in Buri Ram
- Project 32 Establishment of Regional Steel Material Center
- Project 36 Management Transformation Program for Small Scale Company
- Project 38 Tapioca-Ethanol Processing Project

Table 1. PROJECTS/PROGRAMS LIST

Project No.	Project Title	Target Field
1	Establishment of Regional Industrial Development Office	all H
2	Introduction of One Village One Product Movement	6A & B
3	Establishment of Provincial Industrial Development Fund (PIDF)	all C & H
4	Food / Agro-processing Applied Research and Business Development Center Project	1A & D
5	Introduction of Top Executive Seminar Program	all B
6	Diagnostic Scheme for Production Center	6A, B & E
7	Expansion of PRID Programs	5B & F
8	Promotion of Two Step Contract	2A & 3A
9	Establishment of the Marketing and Design Center	2A, D & 6A, D
10	Establishment of Inland Container Depot	all F & G
11	Issuance of the Recommendation Letter by the Provincial Community	all C
12	Establishment of Nakhon Ratchasima International School	all F & H
13	Development of Entrepreneur Fostering Programs (EFP)	all E & F
14	Development of Buri Ram Industrial Estate	all F & G
15	Establishment of Rural Incubation Center	6F
16	Construction of the New Indochina Highway	all G
17	Local Products Quality Warranty System	all H
18	High-tech Human Resource Development Program in Nakhon Ratchasima	all E
19	Establishment an Investment Information System in Each Province	all F
20	Establishment of an International Flight Company	2G
21	E-commerce Development Project in the Provinces	3A & 6A
22	Construction of Natural Gas Pipeline	4G
23	Establishment of a Brand Fashion Outlet Center in Buriram	5A
24	Development of Chemical and Science Industrial Park	4F & G
25	Consulting program for textile and apparel industries	5E
26	Green & Clean Province Campaign	5F
27	Establishment of the Design Department in SUT	6A
28	Strengthening of Micro Scale Finance Schemes	6C
29	Cooperative Development Project for Promoting Indigenous Industries	6H
30	BOI Rural Industries Promotion Project	6F
31	Introduction of Small Scale Cooperate Relief Funds	6C
32	Establishment of Regional Steel Material Center	2D & 3D
33	Sales Channel Match-making Scheme for Indigenous Industries	6A
34	Establishment of a SI Promotion Center Nakhon Ratchasima	3A
35	Establishment of Paktongchai Silk Center	5B & C
36	Management Transformation Program for Small Scale Company	6B & E
37	Worker Education Program	all B
38	Tapioca-Ethanol Processing Project	1D

Table 2. PROJECT/PROGRAM CLASSIFICATION

Projects/Programs which have been already implemented	
No. 2	Introduction of One Village One Product Movement
No. 7	Expansion of PRID Programs
No. 14	Development of Buri Ram Industrial Estate
No. 25	Consulting program for textile and apparel industries
No. 37	Worker Education Program

Projects/Programs which have considered before, but not implemented	
No. 1	Establishment of Regional Industrial Development Office
No. 6	Diagnostic Scheme for Production Center
No. 10	Establishment of Inland Container Depot
No. 13	Development of Entrepreneur Fostering Programs (EFP)
No. 15	Establishment of Rural Incubation Center
No. 16	Construction of the New Indochina Highway
No. 17	Local Products Quality Warranty System
No. 19	Establishment an Investment Information System in Each Province
No. 21	E-commerce Development Project in the Provinces
No. 22	Construction of Natural Gas Pipeline
No. 24	Development of Chemical and Science Industrial Park
No. 29	Cooperative Development Project for Promoting Indigenous Industries
No. 35	Establishment of Paktongchai Silk Center
No. 36	Management Transformation Program for Small Scale Company
No. 38	Tapioca-Ethanol Processing Project

Projects/Programs which are newly proposed	
No. 3	Establishment of Provincial Industrial Development Fund (PIDF)
No. 4	Food / Agro-processing Applied Research and Business Development Center Project
No. 5	Introduction of Top Executive Seminar Program
No. 8	Promotion of Two Step Contract
No. 9	Establishment of the Marketing and Design Center
No. 11	Issuance of the Recommendation Letter by the Provincial Community
No. 12	Establishment of Nakhon Ratchasima International School
No. 18	High-tech Human Resource Development Program in Nakhon Ratchasima
No. 20	Establishment of an International Flight Company
No. 23	Establishment of a Brand Fashion Outlet Center in Buri Ram
No. 26	Green & Clean Province Campaign
No. 27	Establishment of the Design Department in SUT
No. 28	Strengthening of Micro Scale Finance Schemes
No. 30	BOI Rural Industries Promotion Project
No. 31	Introduction of Small Scale Cooperate Relief funds
No. 32	Establishment of Regional Steel Material Center
No. 33	Sales Channel Match-making Scheme for Indigenous Industries
No. 34	Establishment of a SI Promotion Center Nakhon Ratchasima

Chapter 1 Background, Objectives and Scope of the Study

1.1 Background of the Study

The 8th National Economic and Social Development Plan (1997-2001) has set the framework of economic development through dispersal of economic activities to regional area. Within this framework, the 8th Plan calls for the formulation of Strategic Plans for industrial development in Provincial Clusters to ensure the development of such areas accord with their development potential as well as their needs. Such principle is consistent with the development strategy of the Ministry of Industry (MOI). The materialization of such strategy requires the existence of a regional industrial development (or investment) master plan in each provincial cluster.

Within the ideological framework of the National Economic and Social Development Plan, the Office of Industrial Economics of MOI, as directly responsible agency, recognizes the need to initiate activities that would lead to the formulation of the Master Plan for the Industrial Development in the provincial clusters. The objective of this development plan will be to specify the actionable procedures that support the economic activities contributing to the dispersal of the industrial production base and distribution of investment. It is also the expectation that the development plan will define the framework, the need of assistance from the public sector that will provide some guidelines for budget allocation as well as framework and system for improvement of concerned agencies.

The Study was commenced in the end of November 1999 on the basis of the Scope of the Study in the Scope of Work signed between Japan International Cooperation Agency (JICA) and the Office of Industrial Economics (OIE) of the Ministry of Industry of Thailand on August 13, 1999.

1.2 Objectives of the Study

The objective of the Study is to formulate a regional industrial development master plan in the Provincial Cluster of Nakhon Ratchasima, Buri Ram, Surin and Chaiyaphum with the specific development projects which includes action plans

for the promotion of small and medium enterprises in the rural areas. Also, technology transfer in the relevant fields will be made to the Thai counterpart and local consultants throughout the process of the study.

1.3 Scope of the Study

Areas covered:	Provinces of Nakhon Ratchasima, Buri Ram, Surin, Chaiyaphum and Bangkok Metropolitan Region
Industry types covered:	Manufacturing industry excluding rice mill in the study area, especially supporting industries and food processing industry are the priority sub-sectors which will be focused on in the Study.

1.4 Method and Schedule of the Study

Survey Schedule: The schedule for field surveys and the reports made so far are as follows.

Schedule for field surveys

- 1st field survey (explanation and discussion on IC/R) Dec. 1 - 17, 1999
- 2nd field survey (full-scale survey) Jan. 5 - Feb. 24, 2000
- 3rd field survey (explanation and discussion on IT/R and supplementary survey) Mar. 13 - 30, 2000
- 4th field survey (explanation and discussion on DF/R) May 24 - Jun. 6, 2000

Schedule for submission of reports

- Inception Report (IC/R) December 1, 1999
- Interim Report (IT/R) March 15, 2000
- Draft Final Report (DF/R) May 24, 2000

The present conditions of the industries were analyzed mainly through direct hearing from enterprises/factories managers and questionnaire surveys of those enterprises. Concerning policies, systems and financial conditions for regional industrial development and SMEs, the study team visited relevant institutions. As far as direct interviews with enterprises in Surin and Chaiyaphum is concerned, Local consultants have been implemented it under cooperation with Provincial Industrial Offices in two provinces. The numbers of institutions and business

enterprises the survey team has visited during field surveys and the number of enterprises that have responded to the questionnaire survey are as follows.

1)	Visits to government-related agencies (includes educational/training and financial institutions)	32
2)	Visits to business enterprises/factories (by members of the survey team)	121
	Nakhon Ratchasima	39
	Buri Ram	16
	Surin	20
	Chaiyaphum	25
	Bangkok Metropolitan Region	21
3)	Questionnaire survey of business enterprises (by local consultant)	40

In the Study, workshops were held two times in each four provinces. The first workshop aimed at analysis of the present situation of local industries, while the second one was planned as a means of formulation of a strategic plan for provincial industrial development. Number of participants for each workshops are as follows.

	Nakhon Ratchasima	Buri Ram	Surin	Chaiyaphum
the first workshop	37	51	51	51
the second workshop	58	39	30	35

Chapter 2 Current State of the Target Provinces

2.1 Target four provinces

Four provinces selected for this study ("target provinces/provincial cluster") are located in the southwest part of the Northeast Region. Pak Chong, southern part of Nakhon Ratchasima and closest to Bangkok among other regions, is 180km away, and Surin is 500km away at its east end. Buri Ram is bordered on the east by Cambodia. Finally, Chaiyaphum is located inland, north of Nakhon Ratchasima and adjacent to Khon Kaen, administrative center of the region. Basic economic data on the target four regions as compared to the entire country are summarized as follows:

	Country	The Target Provinces	Share of Total
Land area (km^2)	513,114	51,718	10.1%
Population (persons)	60,819,227	6,488,879	10.7%
Population density (per km^2)	119	126	-
GD (regional) P (million baht)	4,598,292	186,376	4%
GPP per capita (baht)	76,634	28,722	37.5%
No. of business establishments	318,660	12,052	3.8%

注)*:Gross provincial product

The target provinces in combined total account for slightly over 10% of the total in land area and population and 3.8% in the number of business establishments. Their average GPP per capita is around one third the national average (one-tenths that of Bangkok). In the ranking based on the overall development index of NESDB, Nakhon Ratchasima ranked 24th, Chaiyaphum 45th, Buri Ram 46th and Surin 53rd.

2.2 Industrial Structure of the Target Provinces

Tables 3 and 4 show industrial and employment structures of the Northeast Region and the target provinces as of 1996. When compared with the industrial structure of the country as a whole (GDP-based) shown in the left side of Table 3, it is obvious that agriculture is a major economic base in all the provinces (or the region as a whole). While the manufacturing sector has a higher share than

agriculture in Nakhon Ratchasima, agriculture shares top position with commerce in other three provinces. The strong position of agriculture is more clearly seen in the employment structure by industry (Table 4). Even Nakhon Ratchasima, where agriculture does not dominate the local economy in terms of GPP, 66% of employees are engaged in agriculture, the lowest percentage among the target provinces. The percentage reaches 85.0% in Buri Ram, 81.6% in Surin and 76.9% in Chaiyaphum, all exceeding the regional average. Thus, the provincial cluster is considered to have the highest concentration of farmers in the country.

Table 3. GPP IN THE TARGET PROVINCES (1996)

	Whole kingdom %	North-eastern %	Chaiyaphum		Nakhon Ratchasima		Buri Ram		Surin	
			million baht	%	million baht	%	million baht	%	million baht	%
Agriculture	11.0	19.9	7,555	26.8	17,226	17.1	7,385	23.2	5,900	23.0
Mining and quarrying	1.4	0.7	0	0.0	1,410	1.4	286	0.9	77	0.3
Manufacturing	28.4	12.2	4,341	15.4	24,579	24.4	3,024	9.5	924	3.6
Construction	7.4	11.1	2,509	8.9	10,980	10.9	3,247	10.2	2,565	10.0
Electricity and water supply	2.3	1.4	395	1.4	1,813	1.8	350	1.1	334	1.3
Transportation and communications	7.3	4.3	1,015	3.6	3,727	3.7	955	3.0	975	3.8
Wholesale and retail trade	15.5	18.9	5,356	19.0	12,592	12.5	7,385	23.2	6,106	23.8
Bank, insurance and real estate	7.6	4.8	987	3.5	4,533	4.5	1,305	4.1	1,180	4.6
Ownership of dwellings	2.4	3.6	1,156	4.1	2,619	2.6	1,305	4.1	1,180	4.6
Public administration and defence	3.7	7.2	1,691	6.0	5,540	5.5	2,260	7.1	2,258	8.8
Service	13.1	15.9	3,186	11.3	15,715	15.6	4,361	13.7	4,156	16.2
Gross provincial product	100.0	100.0	28,191	100	100,734	100	31,863	100	25,654	100

Source: Thailand in Figures 1998-1999, Alpha Research Co., Ltd.

Table 4. EMPLOYED PERSONS AGED 13 YEARS AND OVER BY INDUSTRY (1995)

	Whole kingdom %	North-eastern %	Chaiyaphum		Nakhon Ratchasima		Buri Ram		Surin	
			persons	%	persons	%	persons	%	persons	%
Agriculture forestry, hunting and fishing	46.7	73.1	481,269	76.9	939,700	66.0	661,529	85.0	605,418	81.6
Mining and quarrying	0.2	0.0	-	-	-	-	396	0	803	0
Mnufacturing	14.9	6.2	32,374	5.2	144,299	10.1	17,240	2.2	18,843	2.5
Construction repair and demolition	7.3	3.4	10,276	1.6	68,835	4.8	11,983	1.5	15,356	2.1
Electricity, gas, water and sanitary services	0.6	0.2	1,683	0.3	1,883	0.1	3,913	0.5	408	0.1
Commerce	13.6	7.0	44,059	7.0	126,511	8.9	40,081	5.1	37,720	5.1
Transport, storage and communication	3.3	1.7	6,798	1.1	20,612	1.4	3,967	0.5	10,431	1.4
Services	13.4	8.3	49,769	7.9	121,756	8.6	39,559	5.1	53,318	7.2
Activities not adequately described	0.0	0.0	-	-	-	-	-	-	-	-
Total Employed persons	100.0	100.0	626,228	100	1,423,597	100	778,669	100	742,297	100

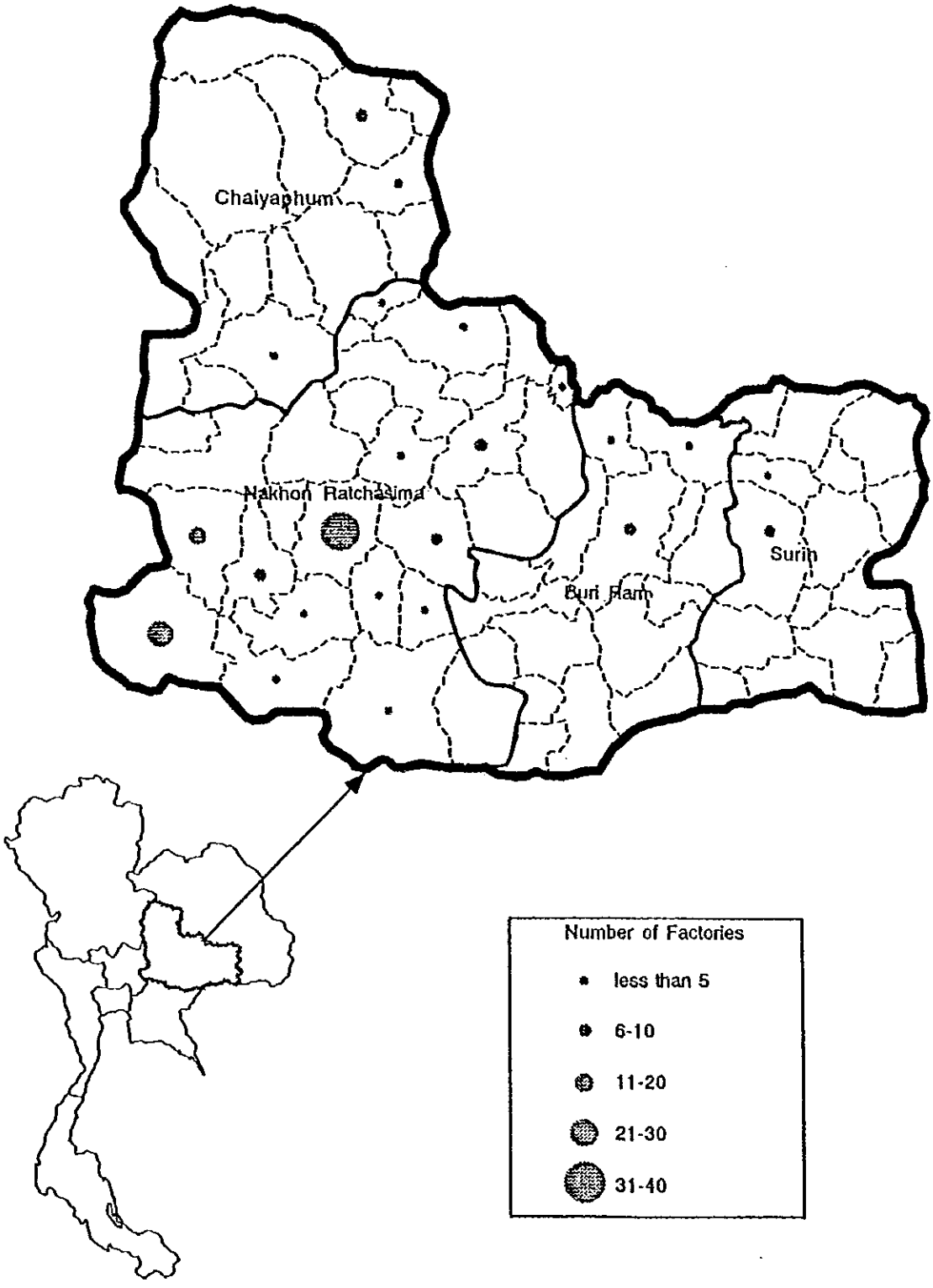
Source: Thailand in Figures 1998-1999, Alpha Research Co., Ltd.

2.3 Geographical Distribution of Factories and Investment in the Target Provinces

Figure 2 shows geographical distribution of factories having 100 or more employees in the provincial cluster as of 1995. Table 5 summarizes the changes in the number of establishments in each province, by size of employment, between 1994 and 1996. As clearly seen, a small number of factories are operated in all the provinces except Nakhon Ratchasima and they are mainly small in size, led by family operations. There are only eleven establishments with more than 300 employees in the three provinces other than Nakhon Ratchasima, as of 1996.

In addition to its high rankings in land area (first place) and population (second), Nakhon Ratchasima is considered to have a strong economic power (sixth in GPP). Naturally, it is expected to play a leading role in economic development efforts for the target provinces. It should be noted, however, that a major thrust is required from the outside to promote economic development, as seen in the case of Rayong. The province is located at the same distance from Bangkok (220 - 255km) as Nakhon Ratchasima, with the same level of population density, and it received large investment (total value of BOI-approved projects) between 1992 and 1995, which is around fourteen times that made in Nakhon Ratchasima. The difference originated in the fact that the central and local governments initiated an economic development program in the province, focusing on capital-intensive, heavy industries. While local conditions are somewhat different, industrial development can be effectively promoted in the provincial cluster, with Nakhon Ratchasima as the center, by planning and implementing a development program based on the region's development potential.

Figure 2. GEOGRAPHICAL DISTRIBUTION OF FACTORIES
(Having 100 or more employees, excepting a rice milling)



Source: "Promotion of Industrial Competitiveness in the Disadvantaged Regions of Thailand" March 1997, UNIDO

Table 5. CHANGES IN THE NUMBER OF ESTABLISHMENTS

No. of Establishments and Size: Nakhon Ratchasima

Size of establishment	No. of establishments			No. of employees		
	1994	1995	1996	1994	1995	1996
1-9 employees	3,483	3,938	4,220	10,515	12,101	13,479
10-19 employees	455	565	701	6,170	7,747	9,644
20-49 employees	327	428	498	9,574	12,697	14,713
50-99 employees	128	179	196	8,744	12,091	13,344
100-229 employees	105	129	141	17,461	21,530	23,367
300-499 employees	22	22	29	8,149	8,163	10,852
500-999 employees	5	6	14	3,216	4,131	9,551
Over, 1000 employees	6	10	13	17,442	23,632	27,936
Total	4,531	5,277	5,812	81,271	102,092	122,886

No. of Establishments and Size: Chaiyaphum

Size of establishment	No. of establishments			No. of employees		
	1994	1995	1996	1994	1995	1996
1-9 employees	1,560	1,614	1,763	4,239	4,468	5,089
10-19 employees	130	161	202	1,721	2,130	2,650
20-49 employees	72	102	123	2,073	2,971	3,602
50-99 employees	33	45	49	2,157	2,984	3,208
100-229 employees	11	16	18	1,483	2,202	2,387
300-499 employees	1	-	-	412	-	-
500-999 employees	1	1	1	805	805	805
Over, 1000 employees	-	-	-	-	-	-
Total	1,808	1,939	2,156	12,890	15,560	17,741

No. of Establishments and Size: Buri Ram

Size of establishment	No. of establishments			No. of employees		
	1994	1995	1996	1994	1995	1996
1-9 employees	1,601	1,654	1,710	4,110	4,377	4,712
10-19 employees	137	145	171	1,809	1,930	2,323
20-49 employees	109	122	137	3,153	3,505	3,983
50-99 employees	27	34	35	1,797	2,271	2,365
100-229 employees	18	18	20	2,711	2,984	3,268
300-499 employees	2	1	2	665	315	785
500-999 employees	2	2	3	1,226	1,188	1,872
Over, 1000 employees	1	1	1	1,435	1,435	1,435
Total	1,897	1,977	2,079	16,906	18,005	20,743

No. of Establishments and Size: Surin

Size of establishment	No. of establishments			No. of employees		
	1994	1995	1996	1994	1995	1996
1-9 employees	1,563	1,575	1,588	5,402	5,503	5,635
10-19 employees	179	189	208	2,415	2,561	2,836
20-49 employees	119	127	152	3,454	3,739	4,327
50-99 employees	29	36	36	1,900	2,696	2,637
100-229 employees	13	13	17	1,882	1,877	2,383
300-499 employees	5	4	4	1,797	1,379	1,264
500-999 employees	-	-	-	-	-	-
Over, 1000 employees	-	-	-	-	-	-
Total	1,908	1,944	2,005	16,850	17,755	19,082

(Source: Year Book of Labor Statistics 1992-1996, Ministry of labor and Social Welfare)

2.4 Policies and Implementation Mechanism for Regional Industries Development

2.4.1 Promotion of SMEs and Regional Industries Development

The Thai government enacted the SMEs Promotion Act in February 2000, which sets forth a basic guideline for policymaking, budgeting and programming related to the fostering of SMEs throughout the country. The act mandates the establishment of the SMEs Promotion Office that is currently underway. The SMEs Development Master Plan has been drafted and will be reviewed at the cabinet meeting. Functionally, the SMEs Promotion Act forms a general framework for SMEs promotion policies and programs, while the SMEs Development Master Plan prescribes strategies, goals and actions at operationalized levels. For instance, Section 4 of the act designates development of regional, rural and community-based SMEs as the scope of coverage, but it does not shows a specific direction of actual promotion, which is instead established in the master plan, as follows:

Promotion of Regional SMEs

Direction I: Fostering of microenterprises and rural industries, and support for startup

(1) Fostering of microenterprises in rural areas by using management resources of large enterprises;
(2) Establishment of incubation centers in rural regions;
(3) Financial support for startup companies using the SMEs Promotion Fund and other ad-hoc lending facilities;
(4) Use of venture capitals to meet the financial needs of small businesses in rural regions; and
(5) Development of information resources related to investment opportunities in rural regions.

Direction II: Promotion of productive use of traditional expertise and resources owned by microenterprises and rural industries

(1) Upgrading of product design and packaging technologies; and
(2) Dissemination of knowledge on the above and the sponsoring of seminars and workshops.

Direction III: Improvement of management capabilities and support for participation in public program

(1) Enhancement of advisory service;
(2) Sponsoring of seminars and workshops designed for local entrepreneurs and community-based enterprises;
(3) Promotion of registration and tax incentive (exemption of corporate tax for five years); and
(4) Promotion of joint procurement of raw materials, storage, packaging and transportation.

Direction IV: Promotion of group and cooperative activities

(1) Support for establishment of an organization representing microenterprises;
(2) Expansion of the role of the trade association; and
(3) Strengthening of support organizations in terms of function and capability.

The public administration system in Thailand is highly centralized and has tight control over local administration. The current local administration system has been developed and operated under the National Public Administration Act of 1991, which mandates the local administration system to be managed in a multi-tier structure consisting three organizations, namely central administration, provincial administration, and local administration.

Thus, the local government system in Thailand is primarily operated by the central administration structure, with two other structures (provincial and local) playing their vital roles. Table 6 shows administrative units in each of the four provinces as of 1999.

Table 6. ADMINISTRATIVE DIVISIONS BY CHANGWAT: 1999

Changwat (Province)	Amphoe (District)	King amphoes (Sub-district)	Tet-sa-ban (Municipality)	Su-kha-ban (Sanitary district)	Tambon (Sub-district)	Muban (Village)
Chaiyaphum	14	1	1	19	124	1,273
Nakhon Ratchasima	24	3	4	42	289	3,212
Buri Ram	17	3	2	22	189	2,287
Surin	13	2	1	13	159	1,912

Note: Putting an English word in parentheses
Source: Bureau of Registration Administration, Department of Local Administration, Ministry of Interior

2.4.2 Current state of financial service and its availability in the target provinces

(1) Types of financial institutions in the target provinces and the number of branches

As shown in Table 7, commercial banks and governmental Specialized Financial Institutions (SFIs) have a large number of branches in the target provinces. It should be noted, however, that there are no financial institutions based in rural regions, including financial companies.

Among SFIs, SIFC established a branch in Nakhon Ratchasima in November, 1999, and SICGC is scheduled to open its first branch there in the end of March this year. IFCT (Industrial Finance Corporation of Thailand) is planned to open Provincial Office (PO) in Chaiyaphum in July, 2000, in addition to the Nakhon Ratchasima Branch and Surin PO.

On the other hand, BAAC (Bank for Agriculture and Agricultural Cooperatives), which mission is to promote agriculture, and GSB (Government Savings Bank) established to promote savings operate 48 and 40 branch offices respectively in the target provinces.

Table 7. NUMBER OF COMMERCIAL BANKs (CBs) AND SFIs IN FOUR PROVINCES (AS OF THE END OF 1998)

Name of CBs & SFIs	Total in North-Eastern Region	Nakhon Ratchasima	Chaiyaphum	Buri Ram	Surin
CBs					
Krung Thai Bank	111	17	7	8	4
Bangkok Bank	87	17	4	6	5
Thai Farmers Bank	74	12	4	4	3
Siam Commercial Bank	63	11	5	2	2
Bank of Ayudthaya	61	8	2	3	2
Thai Metropolitan Bank	43	12	1	4	1
Sri Nakorn Bank	23	5	-	2	1
Thai Bank	17	3	1	-	1
Bangkok Commercial Bank	15	1	-	1	1
Nakorn Liang Bank	13	3	-	2	1
Bank of Asia	12	2	1	-	1
Nakornthon Bank	9	4	-	-	-
Rattanasin Bank	5	2	-	-	-
Thai Thani Bank	4	2	-	-	-
Sub-total	537	99	25	32	22
SFIs					
BAAC	154	20	11	10	7
GSB	131	20	6	8	6
IFCT	6	1	(1)*	-	1
SIFC	2	(1)*	-	-	-
SICGC	0	(1)*	-	-	-
Sub-total	293	42	17	18	14
Total	830	141	42	50	36

(Source) BOT, SIFC, SICGC

(Note) 1. SIFC opened Nakhon Ratchasima Branch in Nov., 1999.
2. SICGC is scheduled to open Nakhon Ratchasima Branch in April, 2000.
3. IIFCT will open Provincial Office in Chaiyaphum in July, 2000.

(2) Major issues related to financial assistance

Comments by SME borrowers

1) The interest rates are still high
2) Additional borrowing is not possible
3) Lack of financial access for cottage industries and microenterprises
4) Lack of information about financial institutions and systems

Comments by financial institutions

Many persons of financial institutions cited various reasons whey they were reluctant to SME loans:

1) They tend to conceal financial figures;
2) Some of them do not produce financial statements and reports;
3) They often report incorrect figures;
4) Some operate for long years despite of insolvency;
5) They do not present detailed sales plan; and
6) The amount they wish to borrow is much larger than their asset value.

2.5 Investment Environment in the Target Provinces

Comparing the provincial cluster of Nakhon Ratchasima, Buri Ram, Surin, and Chaiyaphum with the metropolitan areas in terms of raw materials, labor, infrastructure, and technology, this provincial cluster stands at advantage over Bangkok in availability of some agricultural /mineral resources and supply of cheap labor, while it fall behind Bangkok in supply of engineers and managers/supervisors, physical and social infrastructure, and development of new technology.

Among the four provinces included in this provincial cluster, Nakhon Ratchasima stands at comparative advantage over the other three provinces in access to Bangkok and physical and social infrastructure. Land prices are almost on the same level within the provincial cluster. Buri Ram, Surin, and Chaiyaphum seem to have difficulty in finding other advantages over Nakhon Ratchasima than lower wages and living costs, although there are a few indigenous resources like jasmine rice in Buri Ram and Surin, and potash in Chaiyaphum. Table 8 shows some different points on infrastructure which can be comparable in the target provinces and other major cities in Thailand.

Table 8. INVESTMENT ENVIRONMENT BY PROVINCE (1/2)

Factors	Bangkok (BKK)	Ayutthaya (Central)	Kanchanaburi (West)	Chachoengsao (East)	Lamphun (North)
1 BOI zoning	Zone 1	Zone 2	Zone 2	Zone 2	Zone 3
2 Distance from BKK	-	76km	128km	82km	670km
3 Traffic from BKK	-	Car, Bus, Train	Car, Bus, Train	Car, Bus, Train	Car, Bus, Train, Airplane
4 Harbors	Deep-water port (Khlong-Toey)	-	-	Deep-water port (Laem chabang, Maptaput, Sattahip)	-
5 Airports	International airport (Don Muang)	-	-	-	International airport (Chiang Mai)
6 Water supply (m^3, 1995)	1,405,200,000	6,269,891	5,880,208	11,495,391	-
7 Electricity consumption (10^3kWh, 1995)	20,231,869	1,626,250	497,164	1,164,728	-
8 No. of population per telephone (1998)	2.0 persons	13.2 persons	23.7 persons	14.7 persons	13.3 persons
9 No. of population per school (1996)	3,766.0 persons	1,458.5 persons	1,414.1 persons	1,594.6 persons	1,187.3 persons
10 No. of population per physician	998 persons	6,926 persons	8,277 persons	7,340 persons	9,418 persons
11 Minimum wages per day (Jan. 1998)	Baht 162	Baht 130	Baht 130	Baht 130	Baht 130
12 Selling price of industrial estates (general) per rai	Baht 3,500,000	Baht 2,200,000 - Baht 4,000,000	Baht 1,800,000	Baht 2,200,000 - Baht 4,000,000	Baht 1,600,000
13 Household income per month (1996)	Baht 21,550	Baht 11,376	Baht 10,230	Baht 11,820	Baht 8,735
14 Deposits per capita (1998)	Baht 538,955	Baht 50,070	Baht 24,825	Baht 55,764	Baht 17,739

Table 8. INVESTMENT ENVIRONMENT BY PROVINCE (2/2)

Factors	Songhkla (South)	Nakhon Ratchasima (North East)	Buri Ram (North East)	Surin (North East)	Chaiyaphum (North East)
1 BOI zoning	Zone 3	Zone 3	Zone 3	Zone 3	Zone 3
2 Distance from BKK	950km	259km	410km	457km	342km
3 Traffic from BKK	Car, Bus, Train, Airplane	Car, Bus, Train, Airplane	Car, Bus, Train, Airplane	Car, Bus, Train	Car, Bus, Train
4 Harbors	Deep-water port (Songhkla)	-	-	-	-
5 Airports	International airport (Hat Yai)	Domestic airport	Domestic airport	-	-
6 Water supply (m^3, 1995)	-	12,163,216	5,709,346	6,553,371	8,584,093
7 Electricity consumption (10^3kWh, 1995)	-	1,259,487	239,542	216,584	205,728
8 No. of population per telephone (1998)	12.2 persons	29.6 persons	71.6 persons	79.7 persons	60.5 persons
9 No. of population per school (1996)	1,869.4 persons	1,617.7 persons	1,612.4 persons	1,630.2 persons	1,327.5 persons
10 No. of population per physician (1995)	2,265 persons	8,569 persons	16,571 persons	15,642 persons	16,816 persons
11 Minimum wages per day (Jan. 1998)	Baht 130	Baht 140	Baht 130	Baht 130	Baht 130
12 Selling prices of industrial estates (general) per rai	Baht 900,000	Baht 1,000,000	-	-	-
13 Household income per month (1996)	Baht 11,089	Baht 8,803	Baht 6,446	Baht 6,517	Baht 7,166
14 Deposits per capita (1998)	Baht 48,755	Baht 19,739	Baht 7,176	Baht 7,397	Baht 7,331

Examining the investment trends in the past and the promotional activities so far made, we can point out the following problems.

(1) Investment in Buri Ram, Surin , and Chaiyaphum is not active.
(2) Efforts for inviting investment from outside are insufficient.
(3) Effective information systems are not developed.

The first point is mainly because these three provinces have other particular advantages than abundance of cheap labor force.

As to the second problem, the two major reasons can be thought. At first, the BOI Korat has a limited budget for its activities, although it has some budget for making leaflets for introducing its services and holding seminars. Secondly, the local government agencies including the BOI Korat have not clear ideas or policies of investment promotion.

The third problem is absence of integrated networks for a variety of information including investment promotion.

2.6 Technical Support for Production and Management

(1) Problems regarding Technical Support for Production and Management

Although IPC6 and IPC7 are established in the project area and technical support schemes are prepared, performance of IPC6 and IPC7 does not seem high enough to promote industries.

First of all, most of the personnel in IPC6 and IPC7 are administrative staff of the government and do not have expertise in business management and production. Therefore, without calling up experts from responsible institutes, they cannot give immediate advice to client companies.

Second, the number of personnel in IPC is not enough to cover the schemes to be implemented. Each IPC is responsible for 4 or 5 provinces, while the number of core staff in each IPC is about 10.

Third, training as well as consulting needs of local companies are not well recognized and satisfied by the support. To some extent, this may have been

caused as a result of insufficient staffing of IPC in terms of quantity and professional skills in business management.

Fourth, information on technical human resource in production and management is neither accumulated nor immediately available in IPC. In order for each IPC to find appropriate experts, it has to go through administrative channels of DIP to BSID, BISD or other bureaus, and such a process is time consuming. From the clients' viewpoint, IPC's flexibility and immediate response in the technical support are as important as its quality of service.

Fifth, coordination between IPC and other technical support institutions is not intensive. Recently, other institutions than IPC also started providing technical support for production and management. Among them are SUT, ISMED, EEI, AI, TI, TPA, FTPI and so forth. Although those institutions can technically provide technical support to companies all over the country, their priority may not always be the four provinces. That is because they are responsible for the entire country. In order to draw attention of those institutions to the four provinces, IPC6 and 7 need to actively communicate with and convince them of the necessity of their assistance to the four provinces.

(2) Qualitative Analysis of Human Resource in the Four Provinces

In order to evaluate quality of human resource in the four provinces, intensive interviews and workshops with the private companies, educational institutions and related government officers were conducted. According to the interview as well as workshop results, the human resource in the four provinces, in general, indicates common characteristics. Among them are:

a) In terms of unskilled workers, they work hard and are good at doing routine work.
b) Workers and technicians are generally weak in mathematics and science.
c) Workers and technicians are passive in terms of the improvement activities in the factory.
d) Workers are not used to follow company rules.
e) Local people including management people are not used to logical thinking.

f) Local people including management people do not know much about theories and concepts used in management.

g) Local people including management people are not sensitive to product quality.

(3) Problem of Human Resource Development

First of all, workers in the four provinces have a good reputation as workers for low cost, labor intensive industries. However, there are some companies addressing that quality of workers is not so high in terms of basic knowledge to be learned in elementary and/or secondary schools as well as discipline including punctuality and safety in the factory.

The first problem common to the four provinces is that priority industrial sub sectors are not selected within the province. In order for human resource development efforts to be effective, there has to be a target toward which educational institutions train people.

The second problem is limited opportunities for the students to serve apprenticeship in actual companies. Students cannot learn industrial skills by just sitting in the classrooms or practicing in the school shops.

The third problem is that many college graduates move to other areas such as Bangkok.

The fourth problem is that students in the upper secondary school level tend not to want to join manufacturing companies just after graduation.

The fifth problem is the one regarding business leaders. Executives of existing local companies and local entrepreneurs are not well educated on modern management methods and logic behind that.

Chapter 3 Infrastructure in the Target Provinces

3.1 Infrastructure Development

(1) Spatial Perspective

The four provinces, which consist of Nakhon Ratchasima, Buri Ram, Surin and Chaiyaphum, are located in the south-western corner of the North-East. The city of Nakhon Ratchasima is positioned at the juncture of two major arterials in the North-East. One is Route 2 (Nong Khai - Nakhon Ratchasima – Bangkok. Also called Nong Khai corridor) and the other is Route 24 or 226 (Ubon Ratchathani – Nakhon Ratchasima. Also called as Ubon Ratchathani corridor). From a viewpoint of land transportation, the location of Nakhon Ratchasima represents the function of the city as the gateway of the North-East from Bangkok.

Contrary to it, Nakhon Ratchasima is almost an exit from a viewpoint of water surface transportation because the city is located at upstream of Lam Takhong River, a tribute of the Mekong. The current water surface transportation is, however, less significant than ever.

The above function as a gateway implied the Nakhon Ratchasima's conventional role to connect to the Bangkok metropolitan region. In addition, the role of gateway is changing gradually as other neighboring countries open their markets to international environment. Specifically, the four provinces can be a regional hub among Bangkok, Eastern Seaboard, Cambodia and Laos if provided sufficient infrastructure network. The Figure 3 illustrates the concept from "cul-de-sac" to diversified market access.

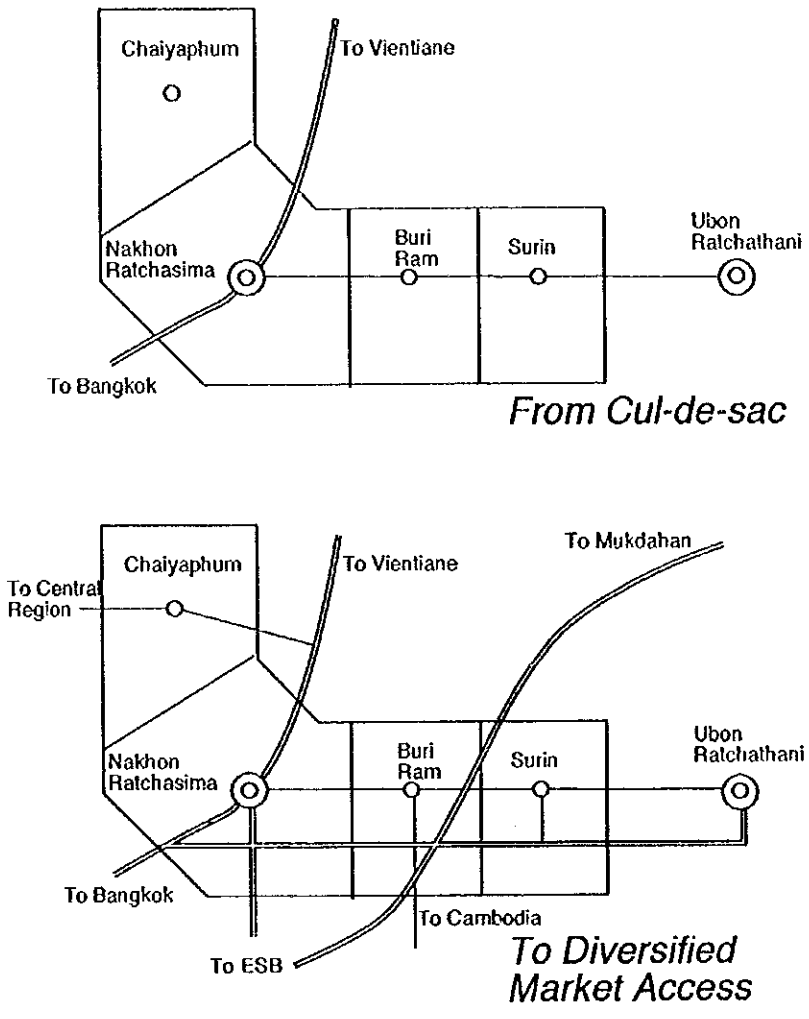


Figure 3. ACCESS IMPROVEMENT AND NEIGHBORS

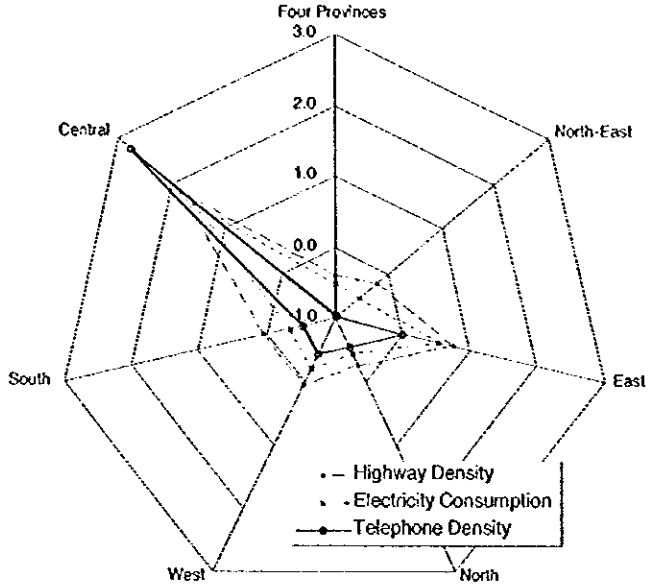


Figure 4. Comparison among Regions

Figure 4 compares the development level of service among regions in the kingdom. The following indicators were selected with standardized indexes:

- Highway density: per two lane km/sq. km (1997)
- Electricity consumption: MKWh/person (1997)
- Telephone Density: Stations/ per 100 persons (1997)

All indicators were standardized with average and standard deviation. The level of 0 is at the national level. The Central Region includes Bangkok and its vicinity. Because these numbers includes rural and urban area within each region, it does not necessarily express the potential for the industrial development.

The Central Region stands out among the regions and the Eastern Region follows it. The utility level in the North-East is the lowest level in the country. Especially, the highway density is the lowest. Telephone density and electricity consumption in the North-East have similar pattern with the North Region. The difference between the four provinces and the North-East is not so prominent that four provinces has the same level with the average of the North-East.

Table 9. AVAILABILITY OF INFRASTRUCTURE SERVICES

	Nakhon Ratchasima	Buri Ram	Surin	Chaiyaphum
Highway	***	**	**	**
Railway	***	**	**	**
Civil Aviation	***	**		
Water Supply	***	**	**	**
Electricity	****	****	****	****
Telecommunication	****	****	****	****

**** Easily available
*** Available
** Available but incovenient
* Hardly available
Not available

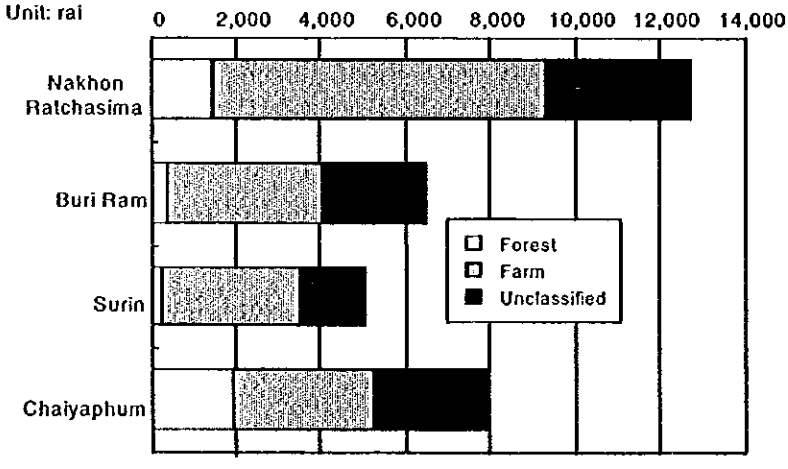
The above Table summarizes the relative availability of infrastructure service by provinces. The electricity and telecommunication services are sufficiently available in the four provinces. Water supplying condition for further industry development, however, is one of anxiety in the target area. Other service level is differentiated by province by province.

(2) Land Use

The highest level of land use classification has three categories:

- Forest land
- Farm land
- Unclassified land

The last category, unclassified land, includes swamp land, sanitary district area, municipal area, railroads, highways and public area.



Source: Alpha Research Co. Ltd. 1999.

Figure 5. LAND USE IN THE TARGET AREA (1993)

The above figure expresses an outline of land use in the four provinces. The forest area occupies the largest percentage (24.1%) in the Chaiyaphum Province. In other three provinces, the portion of forest area is between 3.4% and 11.2%, significantly lower than that in Chaiyaphum.

While the farm land in Buri Ram in 1993 dropped from 1990, other three provinces slightly increased the farm land. This implies that the agricultural activity is still expanding in the three provinces.

For industrial location, current category of "unclassified" land is suitable because it has no conflict with agricultural sector. In the four provinces, the unclassified land is sufficiently available to meet the industrial users' demand.

(3) Industrial Estates

There is the Suranaree Industrial Zone (SIZ) in Nakhon Ratchasima. The SIZ was developed in 1996 and operated by Suranaree Industrial Zone Co., Ltd. The SIZ covers an area of 3,000 rais and some 1,000 rais are now in use. Approximately, 75% them are allocated for factories, 15% for administration, and 10% for utilities. As of December 1999, the SIZ has 83 factories including 19 Japanese affiliated ones like JVC and Orion Electric.

The most important problem the resident factories have been confronted with is lack of human resources with management capability. They moved most of the engineers and managers/supervisors which had worked at their older factories in the metropolitan areas to their new factories in the SIZ. Many of those managerial persons live in Nakhon Ratchasima apart from their families. Although there are Suranaree University of Technology and several technical colleges in Nakhon Ratchasima, they can not meet the growing demand from manufacturers.

Moreover, at present, the IEAT plans to develop an industrial estate with 1,072 rais in Buri Ram. The construction of this industrial estate aims to promote economic development, to increase income, and to create employment in Buri Ram. It is in line with the development policy for regional industries which is adopted by the government.

Chapter 4 Current State of Industries in the Target Provinces

4.1 Manufacturing Industries in Nakhon Ratchasima

(1) Outline of Industries in Nakhon Ratchasima

According to the factory register of the Ministry of industry, there were 5,812 manufacturing establishments in Nakhon Ratchasima as of the end of 1996. This means that the province ranked fifth in the country. Of total, 4,220 establishments had 10 or less employees (72.6%) and most of them were rice mills. On the other hand, there were 56 large enterprises employing 300 or more persons. The number was largest among the target provinces and ranks tenth in the country[1].

While local industries are dominated by the processing of agro-products because agriculture is a traditional economic base of the province, there are a large number of small- and medium-sized machine shops, ceramics factories and construction material factories. Machine shops originated in repairing of agricultural machines and implements, and motor vehicles, which was evolved to machining and metalworking. In the 1990s, new industries such as electric and electronics have started to build and operate production facilities in the province. A major concentration of new industries occurs in and around the Suranaree Industrial Zone. The industrial estate housed 57 establishments as of June 1996, of which electric and electronics manufacturers totaled 13. Thus, industrial diversification takes place in the province while the traditional processing of farm products still occupies the position of a major economic base.

(2) Major Issues on Industrial Development in Nakhon Ratchasima

From general profiles of industrial structure and distribution in the province, it is clear that the existing industrial base has some diversity. The survey of enterprises still continues and the results of the questionnaire survey that is conducted concurrently should be incorporated into the results of the interview survey to reach the final conclusion. Preliminary findings on

[1] It should be noted that the Bangkok Metropolis overwhelms other provinces in the ranking, ten times the number of establishments in the province in second place.

major issues related to industrial development in the province are summarized as follows:

1) To build up the supplier base for the electric and electronics industry;
2) To create value added for traditional industries (upgrading or modernization of production techniques and design);
3) To encourage the upgrading of production techniques and product development in the machining and metalworking industries;
4) To raise the levels of processing of farm products to food production;
5) To train manpower for factory operation, focusing on morale, diligence and skills; and
6) To secure public support for industrial development, including the upgrading of communication and power supply systems, market development, and human resource development and training.

4.2 Manufacturing Industries in Buri Ram

(1) Overview

According to the Ministry of Industry, the number of manufacturing factories in Buri Ram was 2,079 as of the end of 1996. Among them, factories with 9 or less employees numbered 1,710 (82.3 %). Most of those small-size factories were engaged in rice milling. On the other hand, factories with 300 or more employees were only 6. Another statistics by the same source showed there were 98 factories with 20 or more employees engaged in agricultural production or food processing. They included 41 rice mill factories and 30 tapioca factories.

Besides agricultural products like rice and tapioca and construction materials like stone and concrete, there are some medium to large-size factories engaged in the production of garments, footwear, and wigs. Those factories have taken advantage of abundant cheap labor in Buri Ram. Furthermore the plan of developing an industrial estate in Buri Ram is now in motion. This industrial estate is intended to invite factories for food processing and light industries.

(2) Problems for Industrial Promotion in the Province

The agriculture and food processing industry and the light industries can be regarded as two major sectors for industrial promotion in Buri Ram. In the agricultural and food processing sector, it will be imperative to develop new demand areas and highly value added products, on the basis of agricultural resources. A promising direction for industrial promotion in the light industries seems to facilitate the production of international brand products like Nike and Adidas. In the areas of wooden furniture and leather, industrial promotion policies should give priority to development of new markets including export.

The following problems are to be tackled to take the above directions for industrial promotion.

1) Marketing support by the government (e.g. information services, market development, product development)
2) Invitation of foreign enterprises and promotion of technical transfer
3) Creation of a small loan system for SMEs
4) Development of physical and social infrastructure
5) Extension of education among farmers and factory workers

4.3 Manufacturing Industries in Surin

(1) Overview

According to the factory register of the Ministry of Industry, there were 2,005 manufacturing establishments in Surin as the end of 1996. That is the smallest number in the target provinces. Most of the establishments were located in Muang District, Sangkla, Prasart, Tatume District respectively. Most of the establishments was small enterprises and there is no establishment with more than 500 employees.

(2) Problems for Industry Promotion in the Province

Major factories in Surin is rice mill; however, the companies that we visit is small size and all of them run in family style (management), therefore problems that occur in Surin are become usual problems. The following are problems that effect in today operation; low quality product, unskilled

labor, lack of training in accounting and management, abundant cheap labors.

4.4 Manufacturing Industries in Chaiyaphum

(1) Overview

There were 2,156 manufacturing establishments in Chaiyaphum, as the end of 1996. Percentage share of rice mill is high at 66.53%. The remaining 33.47% engage in various activities mostly for local consumption. Agro-industry, car repair and concrete product covers 67.80% of remaining activities. Out of non rice mill, 98% share as small and medium enterprises. The total capital investment of Chaiyaphum manufacturing establishments were 5,953 million Baht, total labor force in these factories were 17,741.

(2) Problems for industry promotion in the province

Problems of Chaiyaphum are similar to Buri Ram and Surin. The following problems are to be tackled in order to solve and promote industrial in the province.

- Provide useful information for marketing, management, production purpose.
- Find foreign investor to invest and transfer technology into the area.
- To train labor force in focusing on skills, diligence and role.
- Establish financial loan program for SMEs.

4.5 Bangkok Metropolitan Area

The survey of selected enterprises in Bangkok Metropolitan Region (BMR) was conducted to address the issues related to major assemblers of electric/electronics and machinery industry, and their relationship with suppliers, i.e., what they think about their current suppliers of raw materials and parts; what they expect from them; whether they are interested in procurement from local manufacturers, and what conditions motivate them to locate their factories in rural regions.

Large manufacturers in Bangkok serve as a major source of high grade, volume products supplied to Europe, the U.S. and Japan, and their production capabilities are considered to be a world class. Today, however, they operate at around 70%

of capacity. If they operate in two shifts, supply capacity can meet demand twice the current level. As the worldwide supply and demand situation is generally on the oversupply side, Thai manufacturers have to operate in the highly competitive environment where they strive to develop new markets by offering products differentiated from others, boost production through market expansion, and reduce prices by improving the operating rate. To achieve these goals, they have to strengthen business capabilities including marketing, the ability to develop products and local procurement of materials. As pointed out earlier, Japanese export-oriented manufacturers operating in Bangkok are responsible for production activities only and leave product development and marketing capabilities to their parents in Japan. Thus, they cannot make critical decision to cope with the difficult situation caused by the economic crisis quickly and effectively, and the lack of autonomy therefore constitutes a major issue to tackle if they are to drive the troubled Thai economy.

Indochina is a relatively small market and Japanese companies do not show strong interest. Realizing the situation, Chinese and South Korean companies are active in exploring the market and provide it with low-cost products. The peninsula has 200 million populations, however, and is expected to become a major market. In fact, it is a potential market for Thai industry. To exploit the market opportunity, they must have the ability to develop it on their own. As Japanese companies have shifted human resources to high-tech industries, they do not have the ability develop products designed for each market, as done in the 1980s. Chinese and Korean companies have been entering niche markets worldwide, where Japanese companies do not make committed efforts. As a result, world share of Japanese companies has declined after the peak in the 1980s. Clearly, it is time for Japanese companies to establish a new regional strategy for Indochina, i.e., leaving the market to local companies in Thailand and allowing them to develop their own products. This way, they will be able to contribute to industrial development from long-term perspectives.

4.6 Current situation and prospects of main industries

4.6.1 Prospects of agro-processing and food industry

Project area has some disadvantage that limited numbers of raw materials, agricultural produce can be harvested because only 10 % of agriculture land are

irrigated and almost land is rain-fed one. However, there are still a lot of rooms to develop agro-processing industry through further improvement of processing technology and technology transfer etc.

It will be also possible to invite food industry such as refreshments and snack foods, which take advantage of cheap and affluent labor, and BOI zone 3 as electronics industry does. But as investment conditions to the area are inferior to those of other areas, local government should consider this point to attract investors.

Capital intensive agro-processing industries such as rice-mill, tapioca, sugar will need to produce higher value added products through improving processing technology.

Especially, as for rice industry, it will be possible to promote integration of rice-related industry through establishments of closer relation between rice and rice-use industries at Nakhon Ratchasima, where is positioned as a growth center.

Linkage between raw materials, agricultural produce and each agro-processing industry

- (Livestock, pig, poultry) Slaughter, meat processing, milk, sausage, animal feed
- (Vegetable and fruits) Fried, canned fruits, vegetable fruits processing (juice etc.), vegetable processing (salt pickling, chili paste etc.)
- (Cassava) Tapioca chip, tapioca flour, Glucose
- (Rice) Rice mill, edible oil, alcohol, rice flour, rice noodle, rice cracker
- (Sugarcane) Sugar
- (Fish) processing by fermentation, seasoning in rice bran paste
- (Food industry) Bakery, ice cream, snack foods, chemical additives, drinking water

Besides that, broken rice, rice bran, peeled skin of cassava, rice bran oil, waste of fruits and vegetable are used as animal feed.

Bakery uses tapioca flour. Ice cream making use powder milk, sugar etc.

Bagasse from sugar refining is used as materials of pulp and particleboard. Mud is used for fertilizer.

Regardless of kinds of products, there are many SME agro-processing industries with less than 50 employee, which have growth potential through improvement of product quality, exploitation of new market such as export, and execution of product marketing. Those SMEs are already getting to accumulate business know-how, as it is rough-planed. If corporate diagnosis, which is included in newly adopted SME development policy is carried out, clarified management problems, with which each company is facing, and some concrete support are implemented to solve such problems, those SMEs will further to grow and contribute regional industrial development.

In project area, many vegetable and fruits producing areas are scattered. As the process allows small-scale, some small vegetable and fruits processing factories exist.

Further support to existing those small processing factories and development of scheme so that producers themselves can process their produce and sell their products will be necessary.

Generally speaking, as many local people doesn't know processing technique and technology or can not secure place to sell their products although they produce enough raw materials, they are obliged to get lower income through selling non-processed agricultural produce. Therefore, Dept. of cooperatives and Dept. of agricultural extension from MOAC and Provincial Industrial Office need to cooperate and contribute regional development through supporting of development of such scheme.

4.6.2 Current state and future outlook for the electric and electronic industry

(1) Current state

In Nakhon Ratchasima, leading electric and electronics makers such as JVC, Seagate and Orion are already operating and supporting industries to serve them are emerging. A major concentration is seen in the Suranaree industrial estate where 13 electric and electronics makers (mainly Japanese) are operating. Suppliers include Nippo (molding), Saian (mold), and APTS and Toyonaga (electronic parts). The move was initiated by assemblers,

followed by suppliers who invested from Japan or Bangkok to establish the parts-supply system to enable local procurement. Suppliers are located near export manufacturers because frequent delivery (twice per day) is required for the manufacture of export products.

(2) Issues

At present, export enterprises that have high levels of technology required by the electric and electronics industry are operated in the province, and local suppliers are emerging, such as molding and pressing shops. Nevertheless, their number is still small and further efforts should be made to bring a wide variety of suppliers into the provide to establish a broad supplier base. The province accommodates a large number of high-tech manufacturers and can grow into a high-tech production base that is comparable to the household appliance production base in and around Bangkok. Major issues facing the electric and electronics industry in the area are summarized as follows:

1) The number of large manufacturers operating in the area is still small and large portions of suppliers have come from other areas because they have to meet strict delivery requirements (twice per day). Thus the present industrial concentration has followed a typical pattern where the assembler comes first and suppliers follow suit to serve its customer. These manufacturers have experienced difficulty in training operators, which took a few years after the start of operation. At present, it is an inevitable cost for them to train rural residents who are accustomed to the carefree lifestyle in the farming community, so that they can work on assembly lines where time is strictly managed. However, if the province is to attract more factories and establish an industrial base, it has to provide education to make local people ready for work at the modern factory. In fact, local government should work together with local residents to develop the work force that meets their goal and the needs of industries that operate in their local community.

2) In the industrial estate, power outage occurs several times per year. Power failure causes defects in high-tech products. Also, the present data communication system is not reliable as e-mail service is not always available.

3) While knowledge and know-how on high-tech production can only be taught through the OJT at factory, workers should receive basic vocational training to learn basic skills that are prerequisite to advanced training. The establishment of more local vocation training center is demanded by many industries including electrical, machinery, and sewing and woodworking.

4) The current supplier base is fairly limited and cannot provide various critical services, such as plating after metalworking, which must be carried out by shops in the Bangkok area to require additional costs and time. It is desirable to have at least one shop in every process to allow the area to handle the entire production process. Efforts should be made to attract industries and foster local manufacturers from the standpoint of developing the complete parts-supply system and a full range of supporting industries.

5) Area-wide industrial promotion should be carried out through a general campaign to introduce local industries and establish their positive image, rather than marketing activities of individual enterprises. Various enterprises express the need for marketing, but they do not have know-how on market expansion activity. It is desirable to have a communal organization to promote local industries under a unified goal of industrial development in the entire area.

4.6.3 Future outlook for the ceramics industry

Ceramic makers in Dan Kwian suffer from quality problems. In particular, large jars are cracked in the baking process and are frequently damaged during transportation for export. The rate of loss reaches an estimated 20% to 30%, and thus the yield rate remains between 70% and 80%. There are a number of factors involved in producing defects, including mixing, forming, baking temperature, and kiln size, and it is difficult for local ceramic shops to overcome them.

They have called experts working in other areas for help, but not much improvement has been made because of local conditions peculiar to Northeast that have to be taken into account when improvement measures are devised.

As the increase in yield rate leads directly to profits, it should be given of priority. Clearly, a support system is required to find solutions, including a testing and research facility in the regional center.

In addition to Dan Kwian, there are various producing areas that make tableware, sanitary ware, insulators, bricks and tiles. They are mass produced in a continuous kiln. On the other hand, ceramic shops in Khorat rely on manual work and primarily manufacture large products. Thus, they do not use much equipment other than kilns, while similar equipment and devices are used to process clays and other raw materials. Notably, potter's wheels are of manual type and need to be replaced with the mechanical type for modernization.

In Dan Kwian, ceramic production is carried out by a family (including relatives) that forms a basic unit of production, who occupies a single shed and is engaged in forming work.

While it is easy to call this type of operation a obsolete production system, it cannot be simply replaced with a modern system overnight. Rather, an attempt should be made to promote the modernization process by gradually introducing new skills that harmonize with the traditional practice.

As ceramics are closely associated with everyday life and people tend to relate ceramic products with a particular producing area, the ceramics industry in Dan Kwian should market unique products with a clear identification. Also, they should use the Internet for the purpose of exploring new markets.

4.6.4 Future outlook for the silk industry

In Khorat, some textile manufacturers supply hand-woven products to Jim Thompson for marketing under the Jim Thompson brand. However, the volume of shipment appears to be very small. Nevertheless, it is clear that traditional silk textiles made in Isarn (Northeast including Surin and Buri Ram) are attractive to the leading manufacturer like Jim Thompson. This suggests a future prospect for the silk industry in the region.

The study team visited four textile manufacturers. One of them supplied its product to Jim Thompson and maintained an excellent quality control system. Particularly, strict inspection and repairing of final products would serve as a model for other manufacturers. These manufacturers cited the issues that are considered to be of common interest, e.g., difficulties in securing high-grade raw materials, training workers, raising funds and finding new markets.

In particular, the shortage of cheap imported silk due to restriction for protection of the local industry was cited by all the manufacturers. Also, they agreed on their inability to explore new markets due to the lack of originality in product design (or the inability to develop a new product).

From the interest of preserving the traditional art, it is important to create new designs on the basis of locally produced textiles, which can appeal to foreign customers, while addressing various issues related to quality assurance, such as dyeing and spinning.

Finally, it should be noted that public assistance is available to support the silk industry. For instance, the Urabot Sericulture Project as part of Green Isarn Project (Khon Kaen) has been producing favorable results since 1974. Also, the Khorat Sericulture Research Center (established in 1966) provides technical assistance and information (the center received JICA's technical assistance between 1969 and 1978). Thus, silk industries in Northeast should use these resources to achieve their goals.

4.6.5 Future outlook for the machinery industry

The machinery industry should serve as the technological foundation for industrial growth in the area. At present, products not locally available are procured from manufacturers in the BMR. Strategically, a high degree of concentration of machinery manufacturers is desirable in the Nakhon Ratchasima area to allow procurement of key parts and components within the area.

At present, joint ventures with Japanese manufacturers operating in Nakhon Ratchasima are capable of supplying parts for office equipment, television sets,

video mechanisms and printers. However, the production system for such precision machined parts is primarily supported by Japanese suppliers who invest in the area and their production techniques, which have still to be transferred to local manufacturers.

Thus, the current production system is established as a foreign enclave led by Japanese manufacturers and does not embrace local enterprises.

As local SMEs are expected to form an integral part of the supplier base to support high-tech industry, the following measures should be taken to promote them in that direction.

(1) To upgrade machining capabilities, currently dominated by general-purpose machine tools, to the latest ones, particularly high precision machines as well as three dimensional measuring instruments for better quality assurance.

(2) To recruit design engineers and train field workers with advanced skills.

(3) To provide low interest rate loans to finance equipment modernization and new investment, together with tax incentives including special depreciation for advanced machinery.

(4) To improve the working environment for precision machining, i.e., better environmental control to reduce dust in the air and provide constant temperature and humidity conditions (most manufacturers seem to have sufficient land and building space).

(5) To consider rationalization of production capacity by disposing old equipment, as many manufacturers still maintain large buildings and a large number of equipment despite the drastic decrease in job order after the economic crisis, and the slimming effort, among other things, should help them to gain short-term profits.

(6) To modernize production management practices (also applicable to other subsectors), which will produce immediate benefits such as the introduction of PCs into design and process control departments, the ability to understand

actual production capacities and skills, and the establishment of a formal quality assurance system.

(7) To create employment opportunities for engineering graduates from colleges in the Nakhon Ratchasima area, which amount to a sizable number comparable to the national average, particularly in the IT area that is expected to develop into a major industrial subsector (currently they find jobs in the BMA) where young engineers form an important infrastructure for industrial development in the area.

While these measures should be taken as the industry's initiatives and it is desirable to establish a public organization to support them.

Chapter 5 Evaluation for Development Potentials and Constraints in Each Province

5.1 Problem Analysis and Objective Analysis through Workshops

In this study, workshops are planned as a means of situation analysis as well as a communication tool among local people, the counterpart and the study team. Therefore, some workshops (Workshops A) are in the form of group discussion involving local people in the private sector, and others (Workshops B, C, D and E) are seminars and presentations to the participants with Q and A sessions.

Workshops A employ the methodology of problem analysis based on the framework of PCM. As a result of the problem analysis, the view of local people regarding the present situation of industrial development in each province was obtained. At the preparation for Workshops B, objective analysis, which is another analytical method of PCM used for the next step of project planning, was applied. The result of the objective analysis on each province's industrial development was utilized for the preparation of development direction for the province, together with the results of the field study done by the eight team members.

5.1.1 Conclusion of Problem Analysis and Objective Analysis

As mentioned in the findings, major issues for industrial development differ from one province to another. In Nakhon Ratchasima, there are many companies in operation and new investment is also increasing. The major issue of the province is upgrading of management and production in companies in order to increase their competitiveness.

In Buri Ram, the province has not got much investment, and as a consequence number of companies as well as varieties of industrial sub sectors are limited. Therefore, Buri Ram's interest is to increase number of investors and amount of investment. As a means of increasing investment from the inside of the province, development of entrepreneurs is the priority. At the same time, the province also needs to attract outside investors by creating an image of one of the most appropriate investment destinations for labor intensive light industries.

In spite of the similar characteristics of the province to that of Buri Ram, Surin has not developed its industry as Buri Ram. Surin needs to differentiate its industrial development direction from Buri Ram's and to develop a complementary relationship with the three provinces in the provincial cluster. That can be achieved by having a strong leader who takes the initiative for the province's industrial development and consolidates opinions into a single and clear direction.

Chaiyaphum is characterized as a closed province both geographically and psychologically in terms of doing business. People in the province hardly see outside, although many workers are going out from the province for finding jobs. Companies in the province pay too much attention to the small market inside the province. That leads to the problem of poor cooperation among the companies in the province. The eyes of business people in Chaiyaphum have to be opened to outside, particularly for marketing of their products.

There is a common issue for industrial development of the four provinces from the problem and objective analyses. That is government support and service activities including preparation of information on investment climates in a single place in each province, provision of technical and management consulting service and training, and intensive communication with the private sector. However, under the current situation, technical and management consulting service is more important for Nakhon Racthasima, and for the rest three, entrepreneurial development and investment promotion activities may be the priority.

5.1.2 Connection between Problem Analysis and Development Directions of the provinces

In this study, problem analysis and objective analysis of the PCM method is used only for the purpose of information sharing among the related parties and situation analysis. Therefore, selection of approaches (or projects) and designing of projects are not to be done along with the process of the PCM method.

The process of formulating the development directions and strategies of the four provinces is shown in Figure 6.

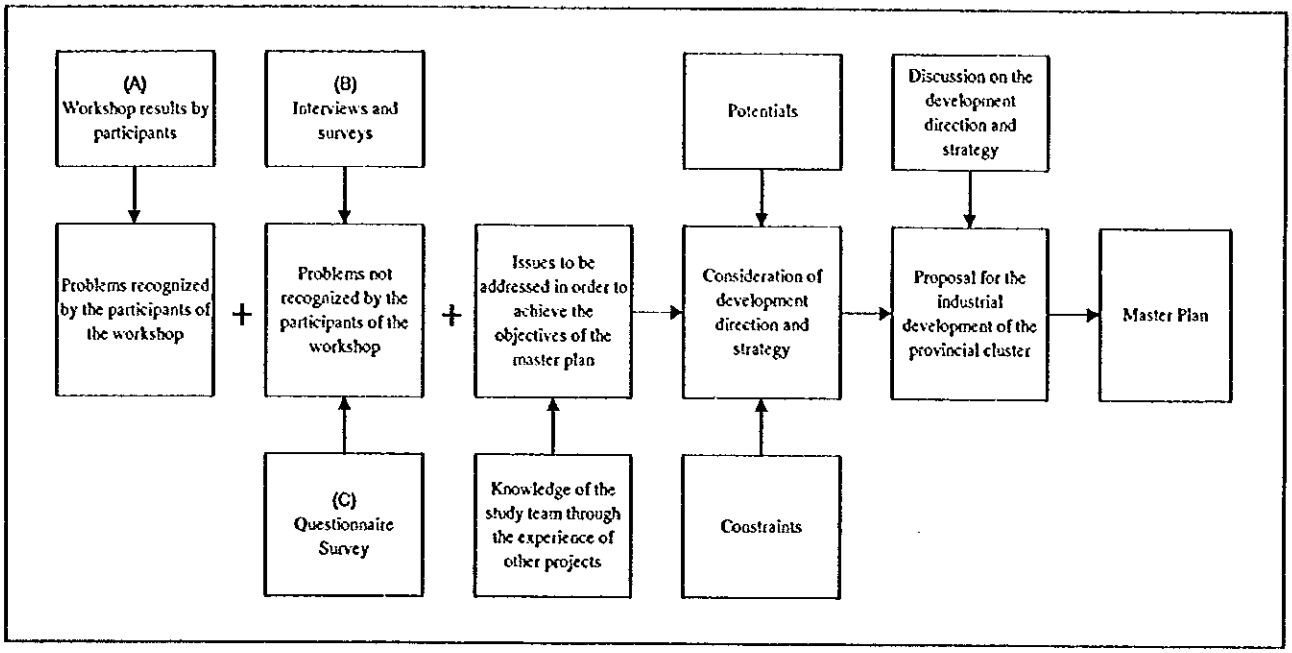


Figure 6. PROCESS OF FORMULATING DEVELOPMENT DIRECTIONS

5.2 Development Potential and Constraints in the Target Provinces

5.2.1 Assessment of Development Potential of the Provinces

The current state of each province and the Provincial cluster analyzed from the perspective of industrial development. As the basis of analysis, the study team looked into (A) the results of the workshops (problem identification and analysis) participated by representatives of local governments and organizations, as well as (B) the results of the interview and (C) questionnaire surveys of selected enterprises and the interview survey of government bodies and related organizations, which were carried out concurrently with the workshops (Figure 6). Generally speaking, the results of the field surveys revealed a clear difference between Nakhon Ratchasima and other three provinces in terms of depth and breadth of industrial foundation. It is important to realize that Buri Ram, Surin and Chaiyaphum are still maintaining their economic base in processing of primary resources including farm products and mining, although other industries are emerging – different types to reflect local conditions

peculiar to each province. On the other hand, the industrial base in Nakhon Ratchasima has successfully extended to advanced processing stages while diverse industries are growing. Thus, the target provinces, although being treated as one region, differ in their initial settings as they start the industrial development process.

(1) Development Potential of the Provinces

Based on the results of the field surveys, comparative advantages and constraints of each prefecture in attracting new industries were analyzed. Note that comparison was made for provinces in Zones 2 and 3 under the BOI's classification. It was assumed that the Bangkok Metropolitan Region (BMR) was already saturated with industries and would no longer be a very attractive area for investment. Rather, existing industries will actively relocate their facilities or build second facilities in other regions. The report also takes into account the SWOT (strength, weakness, opportunity and threat) analysis that is widely used in Thailand, including investment plans prepared by provinces between 1993 and 1995. The results of assessment of development potential are summarized as follows.

(a) Comparative advantages of Nakhon Ratchasima

Comparative advantages	Locational and market factors	Resource and supply factors
Existing comparative advantages	1) Located in the transport node to connect BMR, the Eastern Seaboard Area, and Northeast. 2) Low land price and construction cost 3) Industrial, commercial and educational centers in the target provinces 4) Presence of sources of specialty products, i.e., Dankwen ceramics and Paktonchai silk	6) Abundant mineral and agricultural resources 7) Concentration of metalworking shops (including repair shops) 8) Availability of low-cost labor force
Comparative advantages expected in the near future	9) Geographic concentration of electrical and electronic equipment and parts manufacturers. 10) Emerging as the gateway to the Indochina market.	11) Emergence of skilled work force to support high-tech factory operation

(b) Comparative advantages of Buri Ram

Comparative advantages	Locational and market factors	Resource and supply factors
Existing comparative advantages	1) Two power supply sources 2) Low land price and construction cost 3) Availability of a commercial port 4) Availability of IPC7	5) Availability of low-cost labor force 6) Abundant tourism resources and planned construction of roads connected to Cambodia 7) Water resources
Comparative advantages expected in the near future	8) Expansion of Highway 24 (to be completed in 2006) 9) Planned development of a new industrial estate by IEAT 10) New BOI incentives	11) Abundant rubber plants and eucalyptus for industrial application

(c) Comparative advantages of Surin

Comparative advantages	Locational and market factors	Resource and supply factors
Existing comparative advantages	1) Designated as priority area in the government's regional development policy 2) Low land price and construction cost 3) Opportunity for new investors due to the lack of existing investment	4) Availability of low-cost labor force 5) Silk and rattan as industrial resources 6) Abundant tourism resources
Comparative advantages expected in the near future	7) Expansion of Highway 24 (to be completed in 2006) 8) New BOI incentives 9) Strategic location between Korat and Ubon Ratchathani	10) Return of workers from BMA

(d) Comparative advantages of Chaiyaphum

Comparative advantages	Locational and market factors	Resource and supply factors
Existing comparative advantages	1) Well-developed transportation network 2) Low land price and construction cost 3) Strategic location between Korat and Khonkaen	4) Availability of low-cost labor force 5) Agriculture resources (mango, chili, yellow bean, jute, tapioca etc,) 6) Mineral resources (potash, salt)
Comparative advantages expected in the near future	7) Expansion of highway 8) Opening of IFCT's branch	

(2) Assessment of Development Potential of the Provinces

Comparative advantages of the provincial cluster consists of the above four provinces were analyzed as follows.
the details of each potential was described in the Chapter 2 to 4.

Comparative Advantages of the Nakhon Ratchasima Provincial Cluster

	Location and Market Factors	Resource and Supply Factors
Existing Comparative Advantages	1) Located in the transport node to connect BMR, the Eastern Seaboard Area, and Northeast 2) Low land price and construction cost 3) Big consumer market	4) Abundant mineral and agriculture resources 5) Availability of low-cost labor force 6) Abundant tourism resources
Comparative Advantages Expected in the Near Future	7) Well-developed transportation network 8) A new industrial estate by IEAT 9) Geographic concentration of manufacturing industry	10) Availability of abundant rubber and eucalyptus resources 11) Emergence of skilled work force (Return of workers from BMA)

5.2.2 Evaluation of Development Constraints

(1) Development Constraints in the Provinces

From the standpoint of attracting industrial projects, each of the target provinces has various constraints as well as advantages. The following

tables summarize major constraints for industrial development in the four provinces.

(a) Nakhon Ratchasima

	Supply side (Resources & Materials)	Demand side (Market)	Implementation (organization, human resources, infrastructure)
Constraints of Nakhon Ratchasima *(Existing)*	1. No sea ports and customs houses operating 24 hours. 2. Insufficient water supply (dry season, in particular) 3. Absence of broad industrial base including supporting industries	3. Absence of broad industrial base including supporting industries 4. Small provincial market	5. Lack of skilled workers and managers. 6. Lack of telecommunication facilities
Constraints expected in the near future	7. Decrease in water resources 8. Increase in land price	9. Need to comply with higher quality standards and environmental requirements	10. Increase in labor cost due to progress of industrialization 11. Decrease in investment incentives due to the new BOI zoning

(b) Buri Ram

	Supply side (Resources & Materials)	Demand side (Market)	Implementation (organization, human resources, infrastructure)
Constraints of Nakhon Ratchasima *(Existing)*	1. Insufficient availability of industrial materials, both raw and intermediate 2. No sea ports and customs houses operating 24 hours	3. Low personal income 4. No significant industrial base	5. Lack of skilled workers and managers. 6. Lack of telecommunication facilities 7. Lack of discipline among unskilled workers
Constraints expected in the near future	8. Increase in land price in some areas		9. Lack of local offices of government financial institutions 10. Increase in the number of footloose industries

(c) Surinam

	Supply side (Resources & Materials)	Demand side (Market)	Implementation (organization, human resources, infrastructure)
Constraints of Nakhon Ratchasima (Existing)	1. Lack of proper technology to store and preserve agricultural products 2. Insufficient water supply (poor system) 3. Insufficient availability of industrial materials, both raw and intermediate 4. No sea ports and customs houses operating 24 hours	5. Low personal income 6. No significant industrial base 7. Inflow of goods from Korat and Ubon Ratchatani due to location in between	8. Lack of skilled workers and managers. 9. Lack of telecommunication facilities 10. Lack of discipline among unskilled workers
Constraints expected in the near future	11. Unreliable power supply	12. Further decline in personal income due to deterioration of the farm sector	13. Issue related to conversion of farmland

(d) Chaiyaphum

	Supply side (Resources & Materials)	Demand side (Market)	Implementation (organization, human resources, infrastructure)
Constraints of Nakhon Ratchasima (Existing)	1. Insufficient water supply (dry season, in particular) 2. No sea ports and customs houses operating 24 hours	3. Lack of firm industrial base 4. Location between Korat and Khonkaen	5. Lack of willingness to participate among local people and lack of confidence in government and its support 6. Lack of skilled workers and managers.
Constraints expected in the near future	7. Cost burden for the protection of the environment	8. Worldwide over supply of the chemical products	9. Decrease in investment incentives due to the new BOI zoning

(2) Development Constraints in the Provincial Cluster

A major constraint commonly seen in the provincial cluster is the seasonal return of factory workers to home during the cultivation season. As economic activities and lifestyles in the area are firmly founded on agriculture, the seasonal shortage of factory labor is difficult to avoid and

makes year-round production management difficult for most factories. Also, water shortage is a threatening problem in the provincial cluster as a whole, while the problem has surfaced in some provinces during the dry season.

The lack of customs clearance service within the area is also a major constraint for enterprises which export or import products. At present, most exporters in the area use Lam Chaban Port and few enterprises complain about long transportation (4 hours), while many point out long time required for customs clearance. In addition, the decrease in investment incentives due to the new BOI zoning is anticipated to become a major constraint for Nakhon Ratchasima and Chaiyaphum. Although a final decision has not been made, it will be enacted by the yearend, according to the BOI secretariat. This will become a serious handicap for Chaiyaphum, which industrial base has still to establish, in its effort to attract industrial investment.

Development Constraints of the Nakhon Ratchasima Provincial Cluster

	Supply Side (Resources & Materials)	Demand Side (Market)	Implementation (Organization, Human resources, Infrastructure)
Existing Constraints	1) Insufficient water supply (especially in dry season) 2) Insufficient availability of intermediate materials 3) No significant industrial base	4) No significant industrial base 5) Low personal income	6) No sea ports and customs houses operating 24 hours 7) Lack of skilled workers and managers. 8) Lack of telecommunication facilities
Constraints Expected in the Near Future	9) Decrease in water resources 10) Increase in land price	11) Need to comply with higher quality standards	12) Increase in labor cost 13) Decrease in BOI incentives

Chapter 6 Regional Industrial Development Planning

6.1 Development Goal and Basic Approach

6.1.1 Importance and Goal of Regional Industrial Development

(1) Importance of Industrial Promotion in the Region

The target four provinces basically rely on agriculture as their major economic base. In particular, Buri Ram, Surin and Chaiyaphum are characterized by agricultural provinces. However, most farms in the region, mainly producing rice, cassava and sugarcane, are unable to make much profits from their production. As farmland is often divided into very small lots and suffers from water shortages almost all the time, productivity is generally very low. These problems are originated in geographical and traditional socioeconomic conditions peculiar to the region and there is little possibility to overcome the present situation.

The target four provinces (in fact, the Northeast region) are also known as a major source of labor supply to the BMR and other countries, reflecting the fact that a bulk of labor force cannot find employment other than the agricultural sector. Thus, large portions of people in the region cannot afford to raise their standards of living by purchasing so many consumer goods, while they can produce food to make a livelihood, as seen from various data and indices. As pointed out earlier, they have little prospect for better living so long as the current industrial structure relying on agriculture is maintained in the provinces.

Clearly, promotion and development of non-agriculture industry in the region plays an important role in making a breakthrough in its struggle to achieve the economic well-being of people. In particular, the manufacturing industry is considered to be an effective tool to use local resources and work force in a productive manner, create sizable employment opportunities and thereby increase personal income on a large scale. Narrowing of regional disparities in income and standards of living, decentralization of industries to rural regions.

(2) Target Year

The study proposes an industrial development plan for the Nakhon Ratchasima region (provisional cluster) by setting its target year in 2005. In other words, the plan contains industrial development policies and action plans recommended for the time frame of the next five years, including those to be implemented in the medium- or long-term, such as infrastructure development.

(3) Target Indices

The following target indices are set for the present, namely gross regional product ratio, GPP per capita, number of manufacturing and manufacturing employees. The goal of industrial development in the target four provinces is to improve standards of living of the local residents through restructuring of agriculture dependence economic structure. Table 10 is based on the statistical data in 1996 and projected the year of 2005 by the Team. Three items of GRP, number of manufacturing establishments and employees set with the goal at more than 7%, and GPP per capita will be over 50% of the national average.

Table 10. TARGET ECONOMIC RATIO

	The Whole of Thailand	4 Target Provinces	Ratio against Whole the Country (1996)	Ratio against Whole the Country (2005)
Gross Domestic (Regional) Product (million baht)	4,598,292	186,376	4.0%	7.0%
GPP* per capita (baht)	76,634	28,722	37.5% (100 for the country average)	50.0%
No. of Manufacturing Establishments	318,660	12,052	3.8%	7.0%
No. of Manufacturing Employees	7,690,700	180,452	2.3%	7.0%

Note) *: gross provincial product

6.2 Spatial Framework and Development Axis

The study area that contains Nakhon Ratchasima as the regional center is strategically located in the hinterland of the BMR and the Eastern Seaboard industrial zone, while serving as a gateway to the vast Northeast region.

Furthermore, it has potential to become an industrial base for Indochina as well as Thailand, if economic development progresses in Laos, Cambodia and Vietnam.

The first stage of development should focus on promotion of industrial concentration and inter-industrial linkage in an area within a 300km radius from Nakhon Ratchasima, as shown in Figure 7. Nakhon Ratchasima will be developed into the largest city and industrial center second to Bangkok. Development will take place along two axes. The north-south axis will extend along National Highway Nos.2 and No.304, the latter of which is originated in Nakhon Ratchasima. The east-west axis will cover the areas along Highway Nos.24 and 226, connecting Bamnet Narong, Nakhon Ratchasima, Buri Ram, Surin, and Ubon Ratchathani. Spatially, the four provincial capitals will form a mid-sized metropolitan region, with industrial zones and satellite towns to be developed between the core cities. Furthermore, there is a potential development another north-south axis linked to Indochina, connecting the Eastern Seaboard region with Mukdahan by crossing Buri Ram and Surin.

On the other hand, the industrial linkage within the provincial cluster will remain unchanged in the initial stage, as the focus will be placed on the building of industrial bases in three provinces other than Nakhon Ratchasima. After the provincial industrial bases emerge, efforts will be shifted to the development of the inter-industrial linkage within a loosely-formed industrial concentration straddling over the four nuclei as the second stage. The industrial development process will be led by investment from outside as well as local ventures in each province, rather than the industrial buildup spreading from Nakhon Ratchasima. Then, development efforts will be directed to the establishment or reinforcement of the horizontal linkage within the provincial cluster, i.e., increased interaction and interdependence between local industries in each of the promising subsectors. For some subsectors, such as food processing and silk textile, it appears to be feasible to strengthen the linkage between existing production centers. For instance, primary processing of farm products may be concentrated in Chaiyaphum and Surin, while secondary processing will be relocated to Nakhon Ratchasima and Buri Ram. Similarly, Pakthongchai can be developed to a regional center to collect textile products from local producing centers and disseminate market information to them for better production control. Figure 8 shows inter-industrial linkage and development axes in the target area.

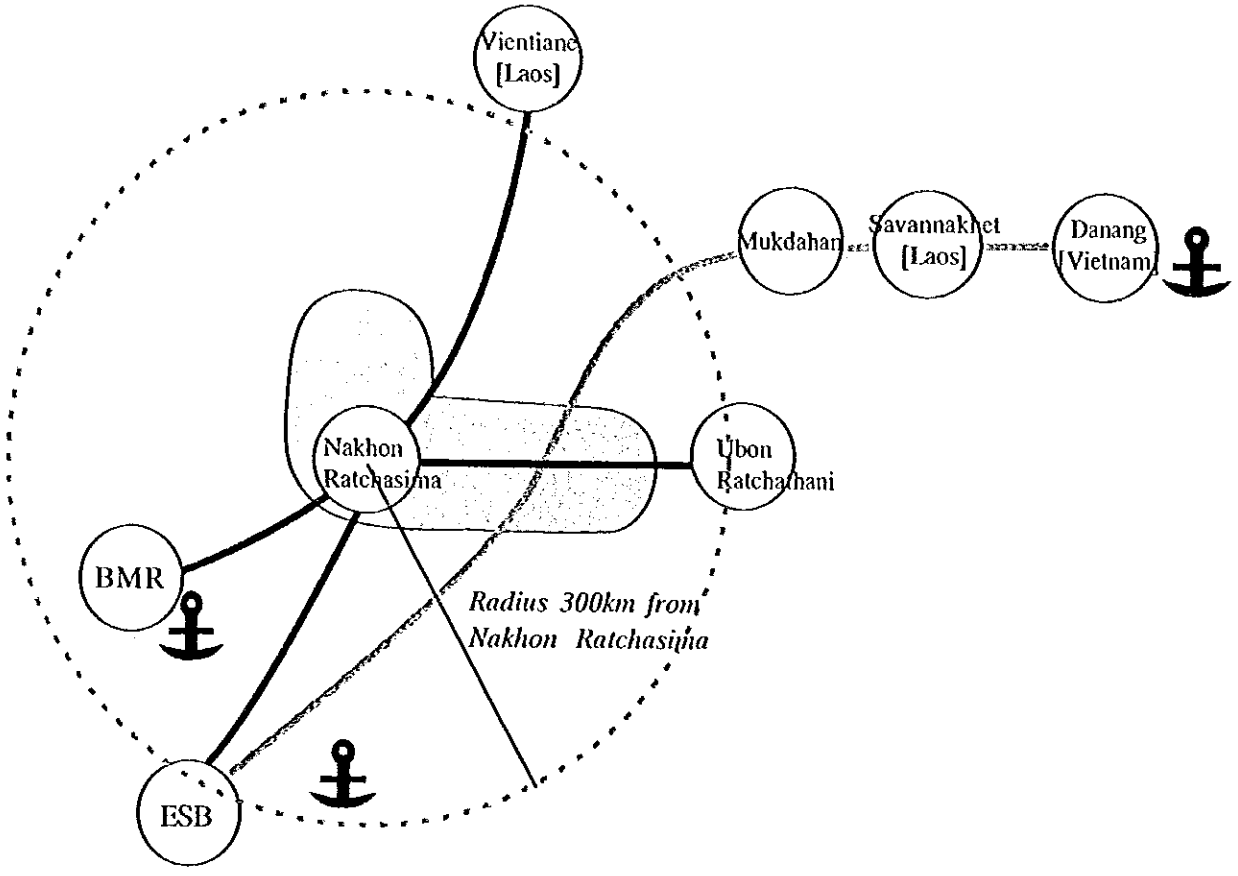


Figure 7 AREA WITHIN A 300KM RADIUS FROM N.K.

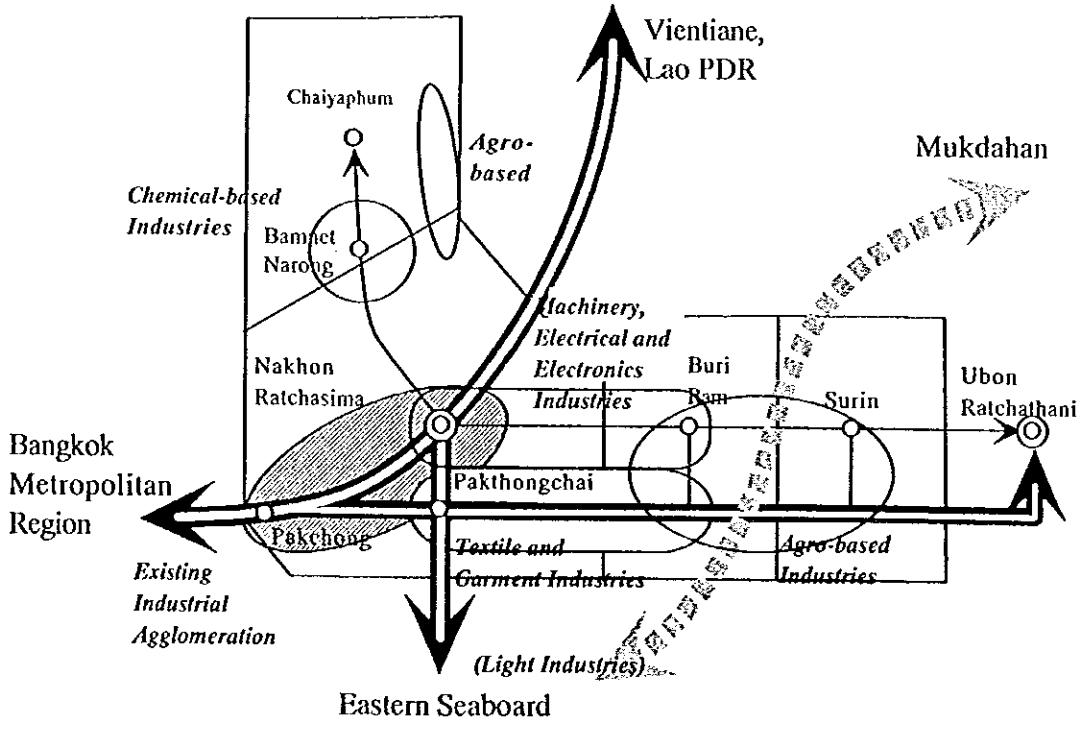


Figure 8 INTER-INDUSTRIAL LINKAGE AND DEVELOPMENT AXES

6.3 General Framework for Regional Industrial Development and Public Support

6.3.1 Major Issues related to the present public support system

At present, industrial development policy for rural areas primarily envisages SMEs and rural industries (not including the development of mineral resources). Within the Thai government, promotion of SMEs is led by the MOI. As discussed in the current analysis (Chapter 2 of the main report), however, various ministries are partially involved in rural industrial development in diverse programs, e.g., support for rural industries by the MOAC, marketing support by the MOC, financial support by the MOF, and assistance in human resource development by the MLSW. These produce some results, but they are mostly planned and implemented under the top-down approach, i.e., they do not necessarily take into account local conditions peculiar to a specific region or area because local offices of the responsible ministries do not take leadership in the planning and implementation process. Furthermore, there is often the lack of communication or coordination among the ministries to maximize efficiency and effectiveness of their programs. Although the NESDB and the MOIT coordinate regional development policies and programs at the central government level, their efforts are focused on infrastructure development, not particularly industrial development.

On the local government side, decentralization is in steady progress, albeit gradually, and some provinces show initiative through Provincial Administration Organization (PAO), an local assembly on local administration. Nevertheless, most provinces, including the four provinces under the study, continue to depend on the central government in terms of financial sources and policymaking capabilities. Similarly, the Sub-district Administration Organization (SAO) manages to function at the tambon level under support of the Department of Local Administration (DOLO). Thus, these organizations have not matured to serve as a self-autonomous body to lead the development process under the initiative of local residents.

Other organizations related to regional industrial development are the FTI (provincial basis), the chamber of commerce, and universities and colleges. Furthermore, the Institute for Small and Medium Enterprises Development

(ISMED), which commenced activity in 1999, will become a critical player in the regional industrial development process. To provide a place of discussion and coordination between the public and private sectors, the JPPCC is held periodically in each province. However, the JPPCC does not make much contribution to regional industrial development as it does not take up it for discussion and it is not represented by SMEs, which dominate local industries.

It is understandable that the establishment of a workable mechanism to promote regional development under the local initiative is difficult in light of the fact that regional development in the country has been traditionally under the exclusive jurisdiction of the central government, and that the "patron-client reciprocity" – a traditional, dependent relationship between local leaders and residents – works as a cultural and social obstacle to the development of the bottom-up, grass-roots approach to regional development. Nevertheless, insofar as the future public support system for regional industrial development cannot sustain without willingness and participation of local residents, the ability to incorporate local power into the process holds the key to success.

6.3.2 Establishment of the Regional Development Council/Regional Industrial Development Office (RIDO)

To address and overcome the issues related to the present public support system, it is recommended to establish new organizations, both at the central and local government levels, which drive the industrial development process in a self-autonomous and efficient manner. They will be responsible for discussion on industrial development of each region/area, the establishment of development policy, and implementation of actual programs. In particular, they are expected to fulfill the following functions that are essential in industrial development efforts:

- Fostering of local industries (including traditional handcrafts)
- Fostering of local entrepreneurs
- Incubation of small enterprises
- Vitalization of small and medium-scale enterprises
- Investment promotion and industrial reallocation from BMR
- Information services including one-stop service
- Promotion of local development projects

At present, some of these activities are carried out by Industrial Promotion Centers (IPCs) (there are eleven centers throughout the country). Nevertheless, the IPCs operate under the DIP and are not self-autonomous organizations that can take initiative in industrial development of each region it is responsible for. The study team proposes the establishment of the Regional Industrial Development Office (RIDO) which will use the IPC's organization and resources with a newly defined positioning and function. The establishment of the Regional Industrial Development Office, Nakhon Ratchasima, is proposed as the first initiative. The Regional Development Council and the Regional Industrial Development Office will have the following organizational structures and roles, as summarized in Figure 9. There is also proposed a strengthening project of IPCs in section 6.5 of the main report.

(1) Central government level

The Central Committee for the Regional Industrial Development will be established to be responsible for regional industrial development policy making at the central government level. It will be organized by government offices and organizations that are deeply involved in promotion of industrial development. The committee will be chaired by the Minister of Industry and "the Regional Industrial Development Act" will be enacted to define the organization, scope of activity and budget for the activities of RIDO. Note that the committee will subsist after the enactment as an organization involved in the regional industrial development process. Also, regional development funds will be established and general rules for allocation will be made. In this sense, the Regional Industrial Development Act will be similar to the SMEs Promotion Act.

(2) Local (regional) level

The Regional Industrial Development Office will be established as a core organization that spearheads the regional industrial development process, ranging from development planning, implementation of action plans/programs and follow-up. Based on the existing IPC, the new organization will accept contribution and human resources from the private sector. While there are eleven IPCs at present, the provincial cluster

development scheme classifies the country into 14 regions. As a result, additional five corporations are to be established, whereas more than two IPCs in the same province will be used for the new purpose. The relationship between the regional classification and the RIDO is summarized in Table 11. Each RIDO will have the Regional Committee for Regional Industrial Development that will serve as the executive board of RIDO.

(3) Role of the PIO

The MOI maintains two types of local organizations, the PIO and the IPC. While the IPC is expected to evolve into the Regional Industrial Development Office, the PIO is expected to play a stronger role as a local arm of the MOI to be responsible for day-to-day public administration service. More precisely, it is recommended to work as provincial industrial statistics office, an important tool for public policymaking, in addition to existing services: (1) registration and approval of business establishments; (2) environmental regulation and guidance in the industrial field; and (3) enforcement of compliance with standards and safety regulations.

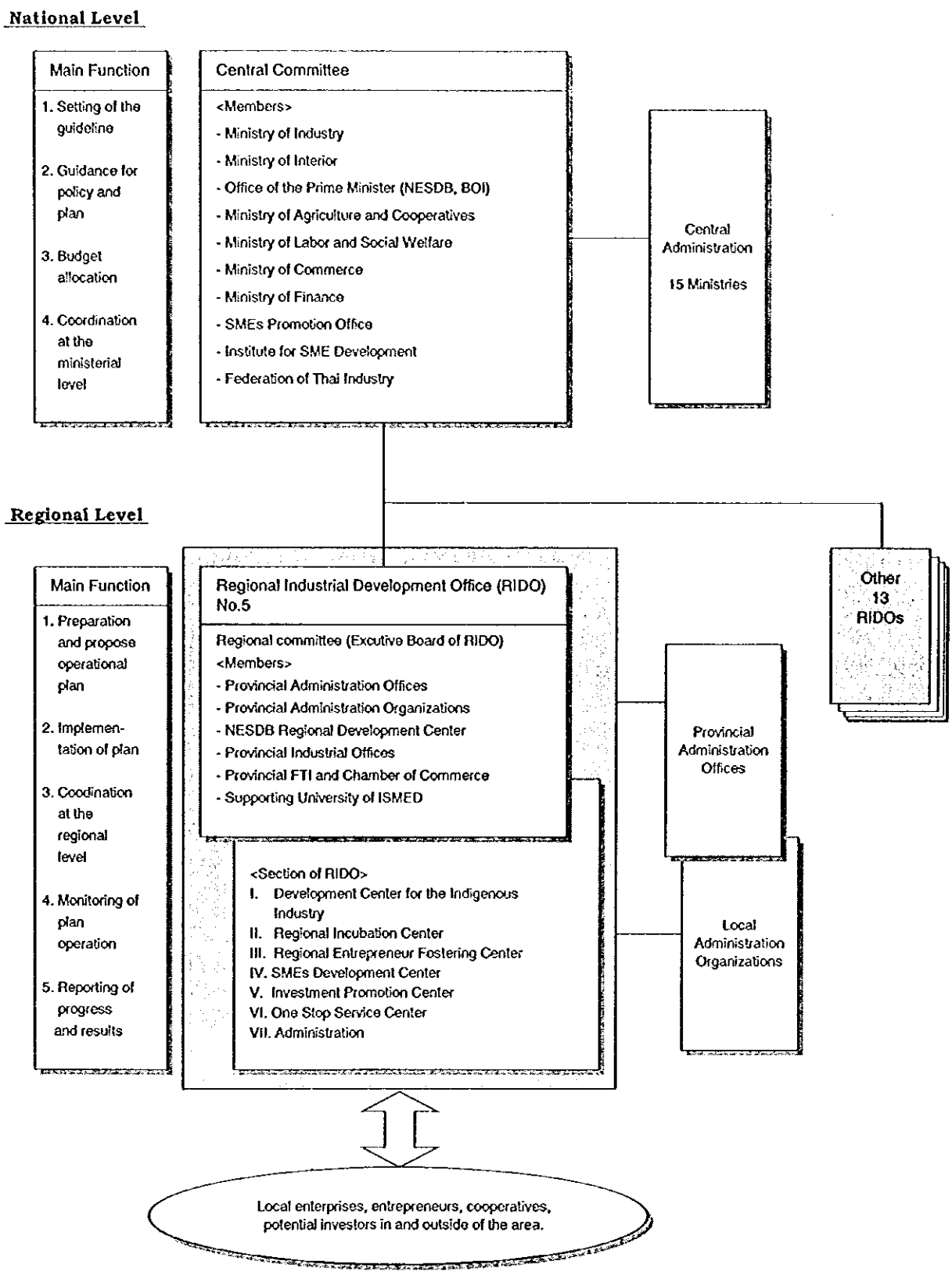


Figure 9. Administrative Structure for the Regional Industrial Development Committee and Offices (RIDO)

Table 11. LOCATION OF NEWLY ESTABLISHED RIDO

NESDB Provincial Clusters	Corresponding IPCs	New Location of RIDO
North (4 Clusters, 17 Provinces)		
1. **Chiang Mai**, Lamphun, Lampang and Mae Hong Son	IPC 1 (Chiang Mai)	RIDO 1 Existing IPC 1 in Chiang Mai
2. Nakhon Sawan, Uthai Thani, Kamphaeng Phet and Tak	IPC 3 (Pichit)	RIDO 2 Newly established in Nakhon Sawan
3. Chiang Rai, Phrae, Nan, Uttaradit and Phayao	IPC 1 (Chiang Mai) IPC 2 (Pitsanuloke)	RIDO 3 Newly established in Phayao
4. **Phitsanulok**, Sukhothai, Phichit and Petchabun	IPC 2 (Phitsanulok) IPC 3 (Phichit)	RIDO 4 Existing IPC 2 & 3 in Phitsanulok
Northeast (4 Clusters, 19 Provinces)		
5. **Nakhon Ratchasima, Buri Ram**, Surin and Chayaphum	IPC 6 (Nakhon Ratchasima) IPC 7 (Buri Ram)	RIDO 5 Existing IPC 6 in Nakhon Ratchasima
6. Ubon Ratchathani, Amnart Charoen, Sisaket, Yasothon and Roi-et	IPC 7 (Buri Ram) IPC 5 (KhonKhaen)	RIDO 6 Newly established in Ubon Ratchathani
7. **Udon Thani**, Nong Bua Lamphu, Nong Khai, Nakhon Phanom, Sakon Nakhon And Mukdahan	IPC 4 (Udon Thani) IPC 5 (KhonKhaen)	RIDO 7 Existing IPC 4 in Udon Thani
8. **Khon Kaen**, Maha Sarakham, Kalasin and Loei	IPC 5 (Khon Kaen) IPC 4 (UdonThani)	RIDO 8 Existing IPC 5 in Khon Kaen
Central (3 Clusters, 16 Provinces)		
9. Rachaburi, Samut Songkhram, Kanchanaburi, Phetchaburi, Prachuap Kiri Khan and **Suphan Buri**	IPC 8 (Suphan Buri)	RIDO 9 Existing IPC 8 in Suphan Buri
10. Prachin Buri, Nakhon Nayok, Chachoengsao, Sa Kaeo, Chantaburi and Trat	IPC 9 (Chon Buri)	RIDO 10 Existing IPC 9 in Chon Buri
11. Sing Buri, Ang Thong, Lopburi and Chai Nat	IPC 8 (Suphan Buri) IPC 6 (Nakhon Ratchasima)	IDO 11 Newly established in Sin Buri
South (3 Clusters, 14 provinces)		
12. Phuket, Phang-nga, Trang, Krabi and Satun	IPC 10 (Surat Thani) IPC 11 (SongKhla)	RIDO 12 Newly established in Krabi
13. Songkhla, Phatthalung, Yala, Pattani and Narathiwat	IPC 11 (Songkhla)	RIDO 13 Existing IPC 11 in Songkhla
14. Surat Thani, Nakhon Si Thammarat, Chumphon and Ranong	IPC 10 (Surat Thani) IPC 11 (Songkhla)	RIDO 14 Existing IPC 10 in Surat Thani

Chapter 7 Outline of the Action Plan

7.1 Structure of the Action Plan

Table 12 classifies the 38 proposals by subsector and field of support, as indicated by symbols on the right column (also refer to the matrix table in Table 13(a). For instance, the project marked "all A" means that it can be applied to all the six subsectors under the study and covers support for market development. Note that there is no proposal covering market development for the chemical industry and production technology related to textile and shoes industries, because the plan envisages that these subsectors will be promoted by attracting investment from outside, and thus investing companies are assumed to have necessary capabilities.

Similarly, the local SME promotion measures, which strategic direction is recommended in JICA's Final Report on the Follow-up Study on Supporting Industries Development and the Mizutani report, have been used as the basis of the respective proposal under the action plan. The report correctly pointed out the major issues related to the development of SMEs in rural areas, namely the provision of an effective promotion system and the development of human resources. In particular, it emphasized the importance of and the difficulty in supporting and fostering small enterprises. The proposal in the action plan attempts to address these issues. Most SME promotion measures proposed in the report, except for financial support, are incorporated into the action plan. As for financial support, the study team agrees with the report's conclusion that the strengthening and expansion of the SIFC and the SICGC is required in rural areas, and efforts are actually made in that direction. In reality, however, small enterprises in rural areas are often not eligible for the SIFC/SICGC programs, so that the study team believes that they should be taken care of under a different framework other than traditional SME promotion policies and programs. It is therefore proposed to enhance the micro-finance system by establishing the funds for fostering small enterprises and providing them through various channels, such as the SIFC, the BAAC, and a new regional development body (RIDO) proposed under this study.

Needless to say, it takes a relatively long period of time until human resource development and organizational/system development efforts take effect. For this

reason, it is important to start the action plan as early as possible. In this sense, projects based on the existing ones and those viable under the private initiative are expected to produce results in the short term. Also, extrinsic development efforts will bring significant benefits within a relatively short period of time, so that an emphasis should be placed on attraction of investment from outside, which should be started from mobilization of necessary resources, including the provision of the information management system, the organizational setup to provide effective information service.

In conclusion, extrinsic development efforts to attract investment from outside will start concurrently with intrinsic development efforts including human resource development and the fostering of local industries accompanied by institutional reforms. Then, the former will produce social and economic effects earlier than the latter. As pointed out earlier, the major issue facing the target provinces is to shift their industrial base from agriculture to manufacturing. To induce the process, the region should attract factories that will help generate the industrial culture. It is important to build and operate a large number of factories, regardless of type, including labor-intensive light industries looking for cheap labor. Thus, the first important step is to have an organization, a system and resources to launch investment promotion activities.

Table 12. PROJECTS/PROGRAMS LIST

Project No.	Project Title	Target Field
1	Establishment of Regional Industrial Development Office	all H
2	Introduction of One Village One Product Movement	6A & B
3	Establishment of Provincial Industrial Development Fund (PIDF)	all C & H
4	Food / Agro-processing Applied Research and Business Development Center Project	1A & D
5	Introduction of Top Executive Seminar Program	all B
6	Diagnostic Scheme for Production Center	6A, B & E
7	Expansion of PRID Programs	5B & F
8	Promotion of Two Step Contract	2A & 3A
9	Establishment of the Marketing and Design Center	2A, D & 6A, D
10	Establishment of Inland Container Depot	all F & G
11	Issuance of the Recommendation Letter by the Provincial Community	all C
12	Establishment of Nakhon Ratchasima International School	all F & H
13	Development of Entrepreneur Fostering Programs (EFP)	all E & F
14	Development of Buri Ram Industrial Estate	all F & G
15	Establishment of Rural Incubation Center	6F
16	Construction of the New Indochina Highway	all G
17	Local Products Quality Warranty System	all H
18	High-tech Human Resource Development Program in Nakhon Ratchasima	all E
19	Establishment an Investment Information System in Each Province	all F
20	Establishment of an International Flight Company	2G
21	E-commerce Development Project in the Provinces	3A & 6A
22	Construction of Natural Gas Pipeline	4G
23	Establishment of a Brand Fashion Outlet Center in Buriram	5A
24	Development of Chemical and Science Industrial Park	4F & G
25	Consulting program for textile and apparel industries	5E
26	Green & Clean Province Campaign	5F
27	Establishment of the Design Department in SUT	6A
28	Strengthening of Micro Scale Finance Schemes	6C
29	Cooperative Development Project for Promoting Indigenous Industries	6H
30	BOI Rural Industries Promotion Project	6F
31	Introduction of Small Scale Cooperate Relief Funds	6C
32	Establishment of Regional Steel Material Center	2D & 3D
33	Sales Channel Match-making Scheme for Indigenous Industries	6A
34	Establishment of a SI Promotion Center Nakhon Ratchasima	3A
35	Establishment of Paktongchai Silk Center	5B & C
36	Management Transformation Program for Small Scale Company	6B & E
37	Worker Education Program	all B
38	Tapioca-Ethanol Processing Project	1D

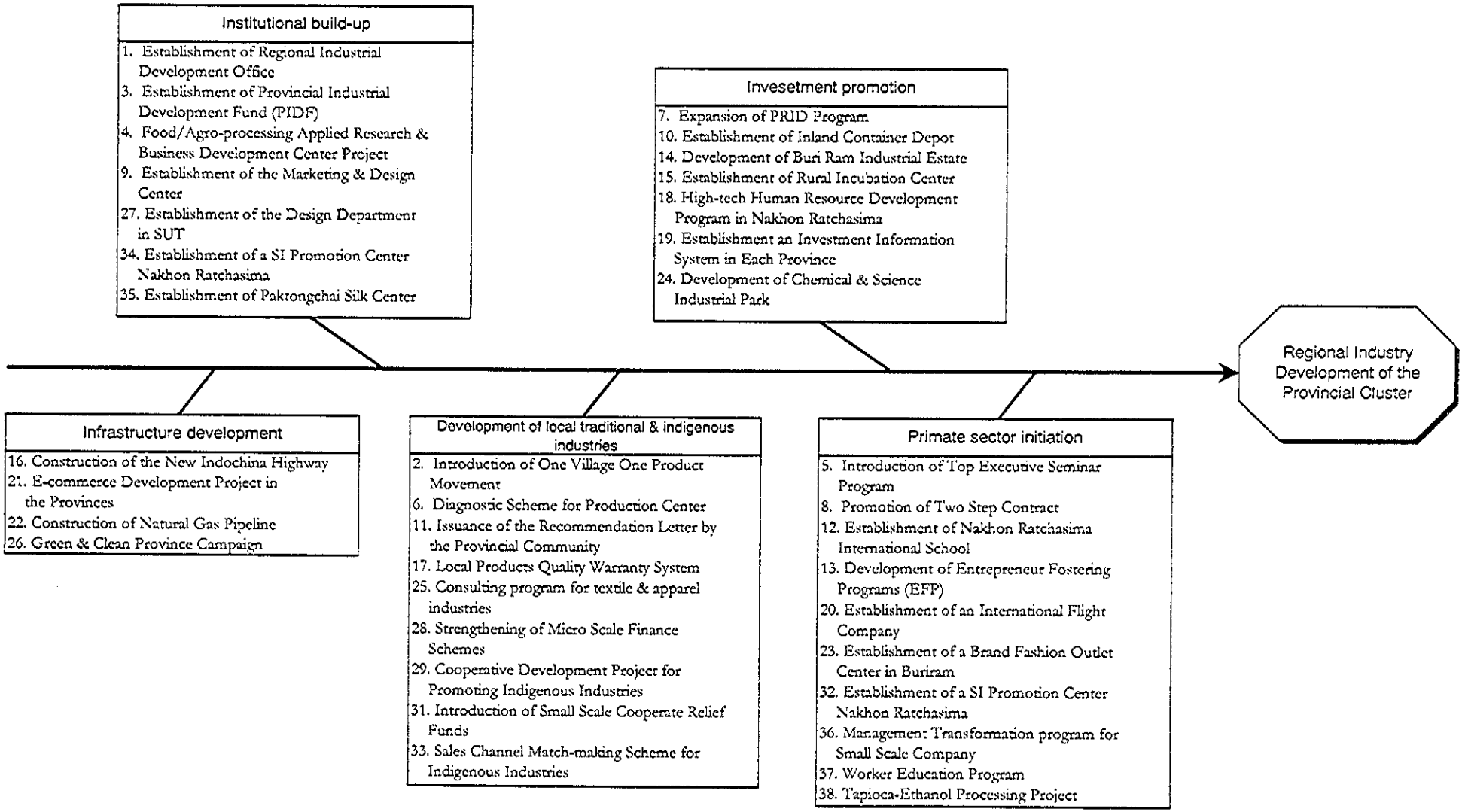
Table 13 (a) PROJECT/PROGRAM MATRIX

Sub-Sector / Supporting Field	1. Agro/Food Processing	2. Electrical/ Electronics	3. Machinery/ Metal Working	4. Chemical	5. Garment/ Footwear	6. Traditional/ Indigenous
A Market Development	1A	2A	3A	4A	5A	6A
B Human Resource Development	1B	2B	3B	4B	5B	6B
C Finance	1C	2C	3C	4C	5C	6C
D Production/Process Technology	1D	2D	3D	4D	5D	6D
E Management	1E	2E	3E	4E	5E	6E
F Investment Promotion	1F	2F	3F	4F	5F	6F
G Infrastructure	1G	2G	3G	4G	5G	6G
H Institution/Regulation	1H	2H	3H	4H	5H	6H

Table 13 (b) PROJECT/PROGRAM MATRIX

Sub-Sector / Supporting Field	1. Agro/Food Processing	2. Electrical/ Electronics	3. Machinery/ Metal Working	4. Chemical	5. Garment/ Footwear	6. Traditional/ Indigenous
A Market Development	4	8, 9	8, 21, 34		23	2, 6, 9, 21, 27, 33
B Human Resource Development	5, 37	5, 37	5, 37	5, 37	5, 7, 35, 37	2, 5, 6, 36, 37
C Finance	3, 11	3, 11	3, 11	3, 11	3, 11, 35	3, 11, 28, 31
D Production/Process Technology	4, 38	9, 32	32			9
E Management	13, 18	13, 18	13, 18	13, 18	13, 18, 25	6, 13, 18, 36
F Investment Promotion	10, 12, 13, 14, 19	10, 12, 13, 14, 19	10, 12, 13, 14, 19	10, 12, 13, 14, 19, 24	7, 10, 12, 13, 14, 19, 26	10, 12, 13, 14, 15, 19, 30
G Infrastructure	10, 14, 16	10, 14, 16, 20	10, 14, 16	10, 14, 16, 22, 24	10, 14, 16	10, 14, 16
H Institution/Regulation	1, 3, 12, 17	1, 3, 12, 17	1, 3, 12, 17	1, 3, 12, 17	1, 3, 12, 17	1, 3, 12, 17, 29

Figure 10. PROJECT/PROGRAM COMBINATION



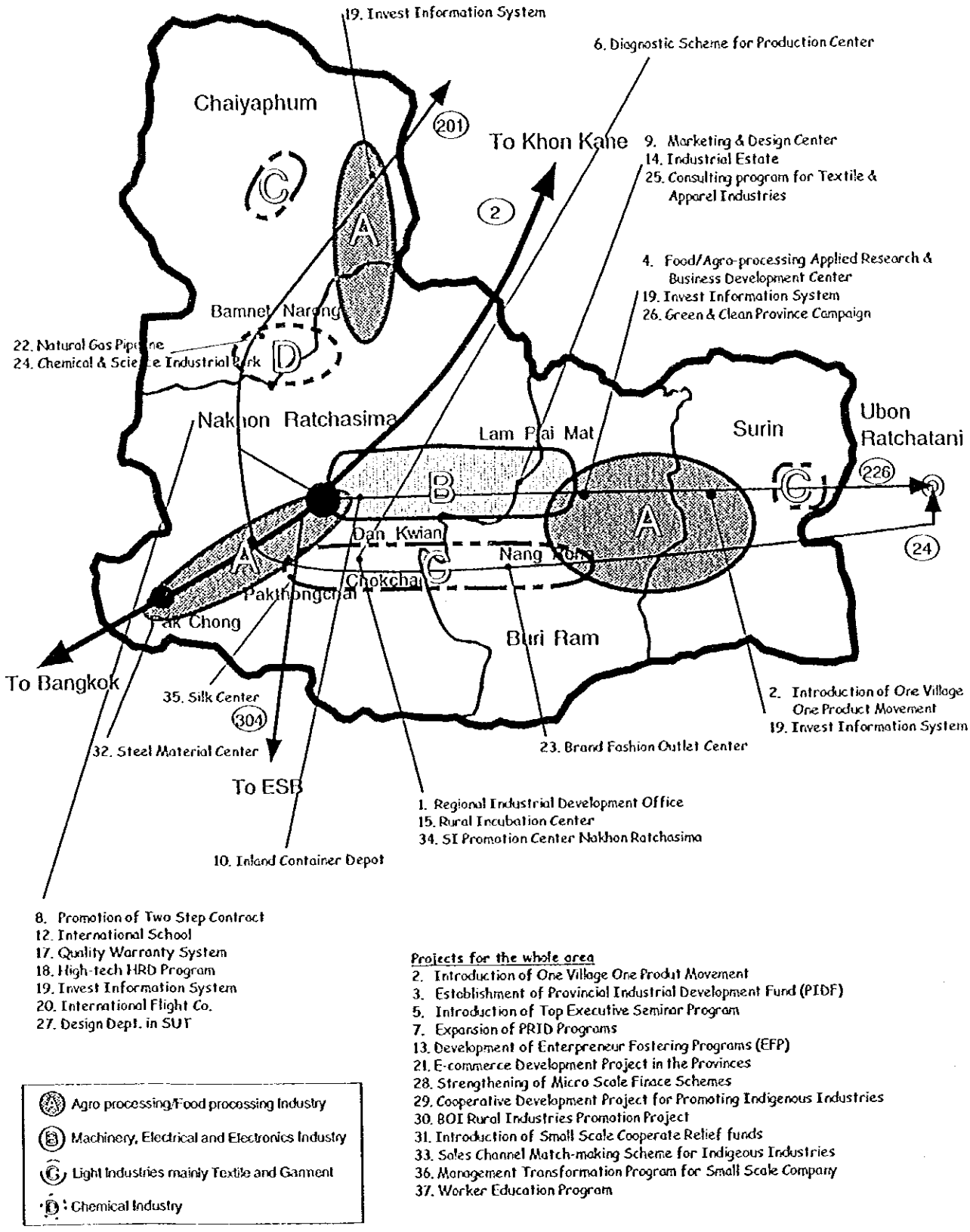


Figure 11. PROJECTS/PROGRAMS IN THE TARGET CLUSTER