

Chapter 6 Regional Industrial Development Planning



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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.

The Thai government is currently implementing the 8th National Economic and Social Development Plan that will end in 2001. The 9th plan is current in the process of developing a general outline on the basis of public hearings held throughout the country. According to NESDB, the 9th plan will set forth the strengthening of competitiveness as one of the key objectives of industrial development. Naturally, the industrial development plan for the Nakhon Ratchasima will be aligned with the new policy target of the 9th plan (2001 – 2006) by addressing the issue of promoting the region's industrial competitiveness in an effective and efficient manner.

Furthermore, the regional industrial development plan will leverage the government's recent measures that focus on promotion of industry by recommending a variety of projects and programs as key components of the plan, including those contained the Industrial Restructuring Plan that is implemented in response to the economic crisis in July 1997, as well as those under the SME Promotion Act.

(3) Target Indices

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. A projection of incremental capital output ratio for further regional development is not done in the report due to difficulty of getting economic data during field surveys. Therefore, the following target indices are set for the present, namely gross regional product ratio, GPP per capita, number of manufacturing and manufacturing employees. Table 6.1-1 is based on the statistical data in 1996 and projected the year of 2005 by the Team.

Table 6.1-1. 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%	50.0%
			(100 for the country average)	
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

6.1.2 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.

6.1.2.1 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

1) **Electric and electronics industry:** Fostering of supporting industries including suppliers and machining shops

There is a limited number of supporting industries for the electric and electronics industry, such as mold making and press work (no plating shop). Among them, the press work industry has established a strong base that can compete with that in Bangkok and has further growth potential. For

assembly makers who intend to supply their products to the Indochina market, supporting industries are essential as they help realize diverse product designs. The further development of the electric and electronics industry will have to depend on relocation from BMR and new investment by foreign companies.

2) **Food processing industry:** Evolution from agro-processing to food processing

Major farm products in the province are rice, sugar and tapioca. Except for tapioca starch, they have limited industrial applications as principal materials. Rather, a new food processing business should be promoted to leverage locational advantages and low production costs. As there is the paucity of local resources, investment by outside companies including foreign ones is expected to play a central role.

3) **Machinery and metalworking industries:** Integration to the parts supply industry

A final goal is to establish supporting industries that are capable of serving manufacturers in Northeast, East and Center. It is a long way to go as most establishments have not established standard levels of factory operation and management. They need to start from basic quality control activities such as 5S and 3S. At the same time, there is the lack of market information, e.g., what products are demanded and how buyers should be found. Support will be provided in these areas to upgrade the industries as a whole. The major focus will be placed on local enterprises with a relatively long history of operation.

4) **Local resource-based industries:** Revitalization of traditional industries such as silk and ceramics

Silk and ceramics industries, which boast a long history of operation in the province, are facing similar issues, i.e., low productivity, the lack of design or product development capability (pervasiveness of imitated products) and the lack of market development capability. Furthermore, these industries hold a large number of employees. Although widely known in the market, their products are not attractive enough to compete with foreign products.

They require improvement efforts in every aspect of operation, from the effective use of raw material to marketing.

(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

- 1) **Apparel industry:** Attraction of apparel manufacturers, particularly those of brand products

Efforts will be made to attract volume apparel manufacturers (including local license manufacturers) and their suppliers with low production costs and abundant labor supply. In the process, MOI's PRID program should be used as far as possible.

- 2) **Light industries:** Modernization of leather and woodwork manufacturers

Those currently in operation are small in size and require modernization in the areas of production and management. The major challenge for the management is to expand market channels. Given the rich natural resources in the province, including leather, wood and rubber, and the locational advantages, these industries have good potential to become the province's major industries if modernization and marketing efforts are made properly.

- 3) **Local resource-based industries:** Business diversification

In the province, various industries using natural resources are operating, including quarrying, rice polishing and tapioca milling. These industries have low growth potential and are expected to diversify into related business areas.

(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

Jasmine rice produced in Surin is known throughout the country. Its supply including the inflow from other provinces is sufficient to meet demand for processed food. As the method for processing jasmine rice to foodstuff is not fully studied, the commercialization process should start from basic research. Processed food based on jasmine rice should include souvenirs for tourists.

2) Resource-based industries: Silk, rattan, bamboo and leather products

Existing products should be refined to meet the market needs while taking advantage of characteristics of local resources and the traditional processing method. Also, new products will be developed. So far, traditional products have not appealed to general consumers in terms of design and quality, and market development efforts have not been sufficient.

(7) Strategic direction of development and basis of proposal

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. 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

1) Chemical industry: Chemical industry derived from potash

ASEAN Potash Mining Project, which promotes the potash business, has already specified 16 sub-sectors in the chemical industry that have development potential in the area. While other applications seem to be feasible from actual applications seen in the surrounding area, the strategic focus is placed on the resource-based chemical industry

2) Textile industry: Diversification of the textile industry using traditional sewing techniques

To use traditional textile technology, sewing and other apparel manufacturers will be attracted to Ban Kwao from outside. Note that efforts will be made to accommodate the entire textile and apparel making process from fabrics to sewing and supply of related materials, rather than concentration of sewing makers who rely on low production costs and tend to compete intensively.

3) Food processing industry: Development of new areas of food processing

The food processing industry will be developed to a major element of the province's industrial base, in addition to the chemical industry. New food processing technology including genetic engineering will be introduced to foster new sub-sectors and form a broad-based chemical sector including the traditional sub-sectors using natural resources.

6.1.2.2 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 6.1-1). 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.

- Creation of Green-Technoland -

Development and vitalization of industrial strongholds
in Northeast region

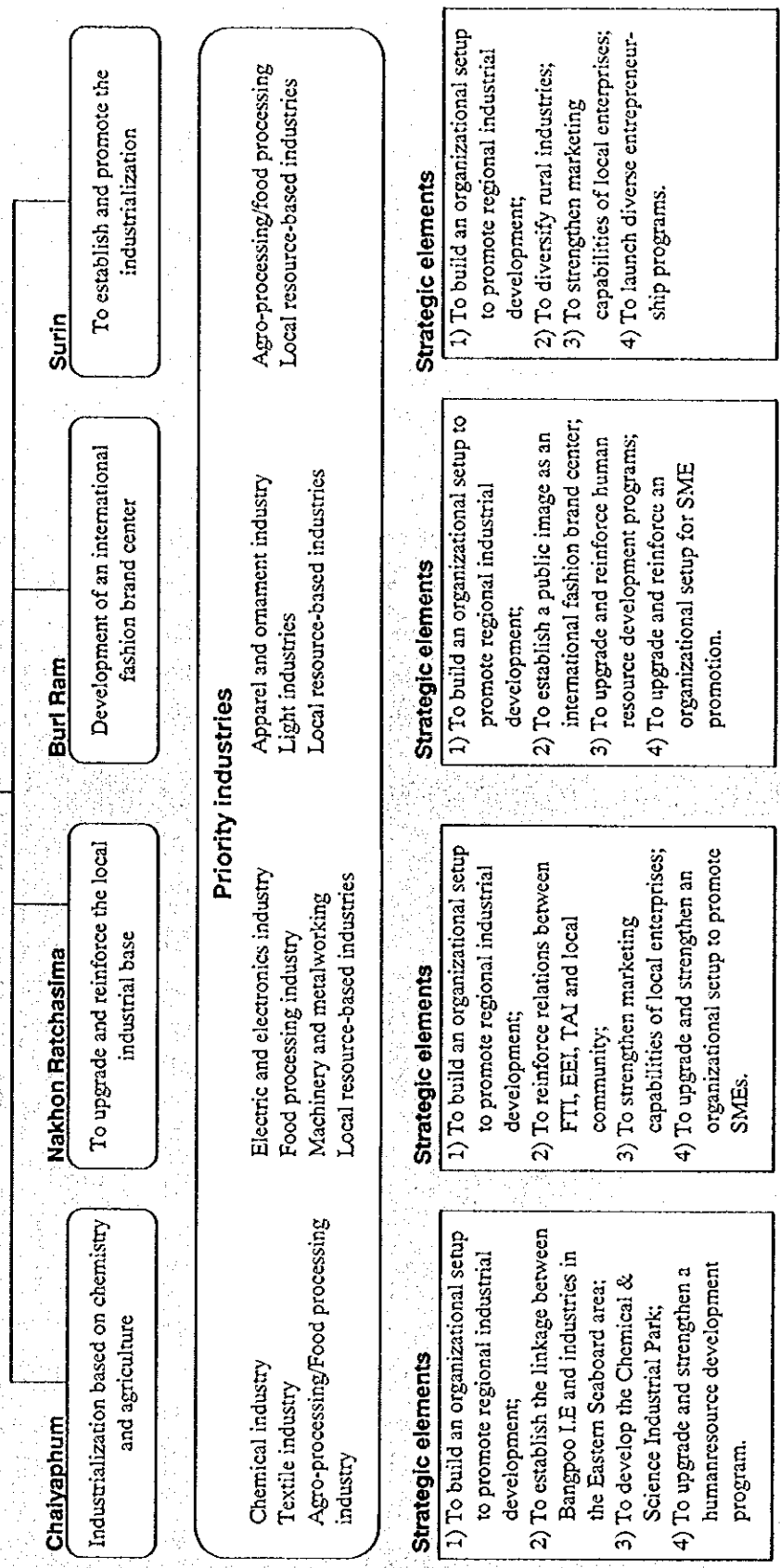


Figure 6.1-1. DEVELOPMENT DIRECTION & STRATEGY OF NAKHON RATCHASIMA PROVINCIAL CLUSTER



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 6.2-1. 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 6.2-2 shows inter-industrial linkage and development axes in the target area.

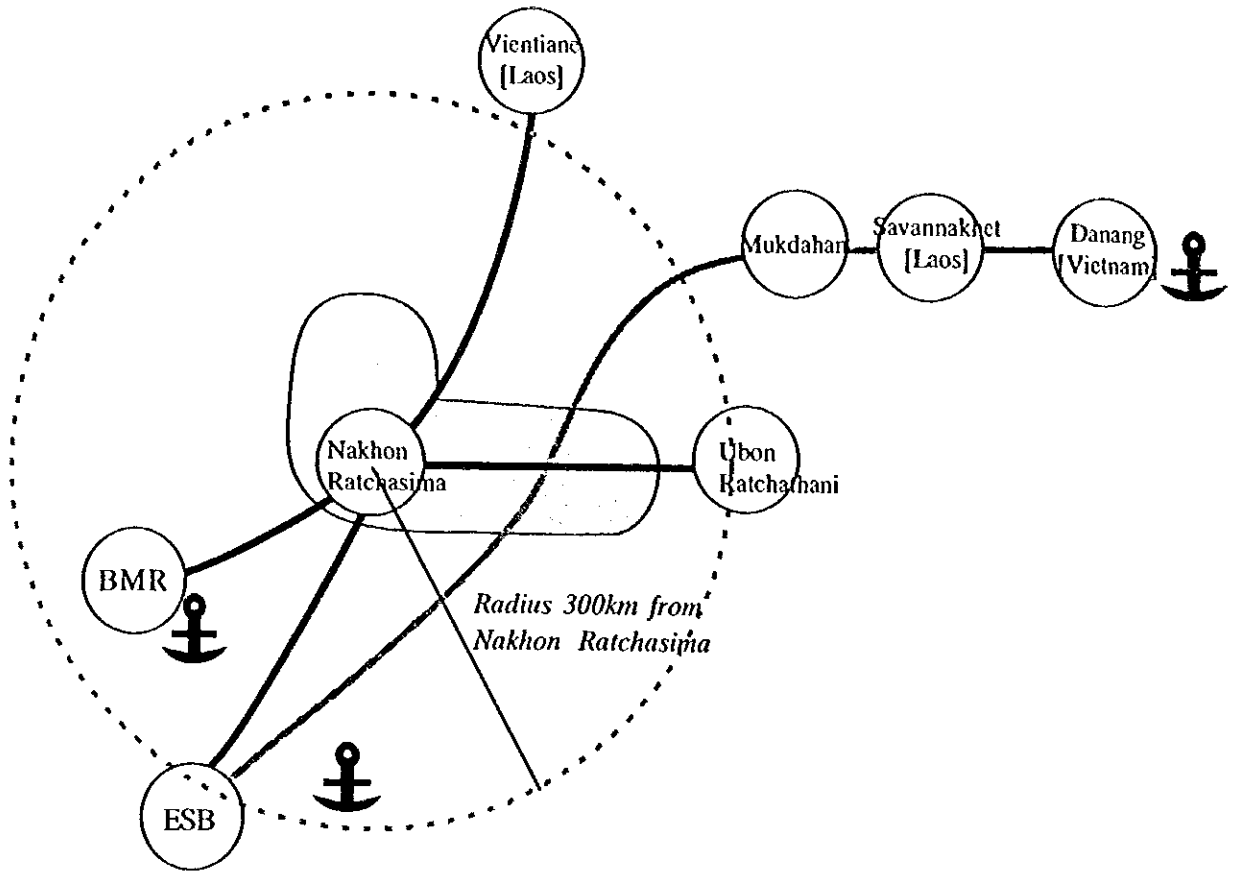


Figure 6.2-1. AREA WITHIN A 300KM RADIUS FROM N.K.

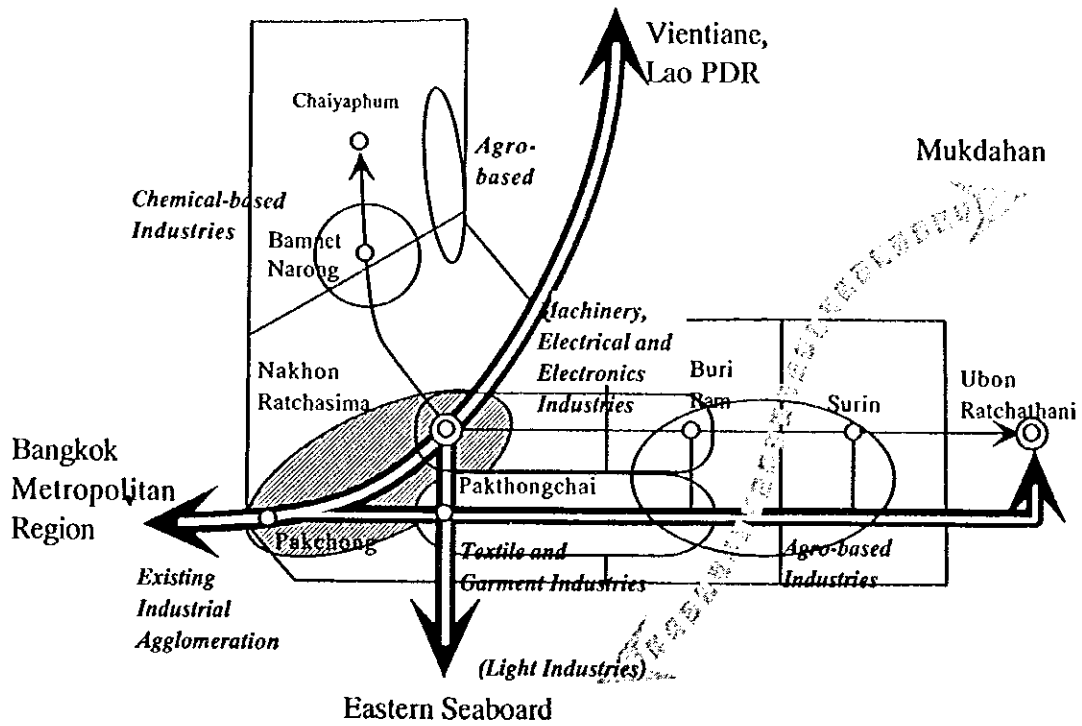


Figure 6.2-2. INTER-INDUSTRIAL LINKAGE AND DEVELOPMENT AXES



6.3 General Framework for Regional Industrial Development and Public Support

This section discusses and proposes desirable policy direction related to the public support system for regional industrial development in the country. Note that projects related to organizational setup are proposed in Chapter 7, followed by supplemental discussion in Annex I.

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), 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. As discussed in 2.2, 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 handicrafts)
- 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 6.3-1. There is also proposed a strengthening project of IPCs in section 6.5.

(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

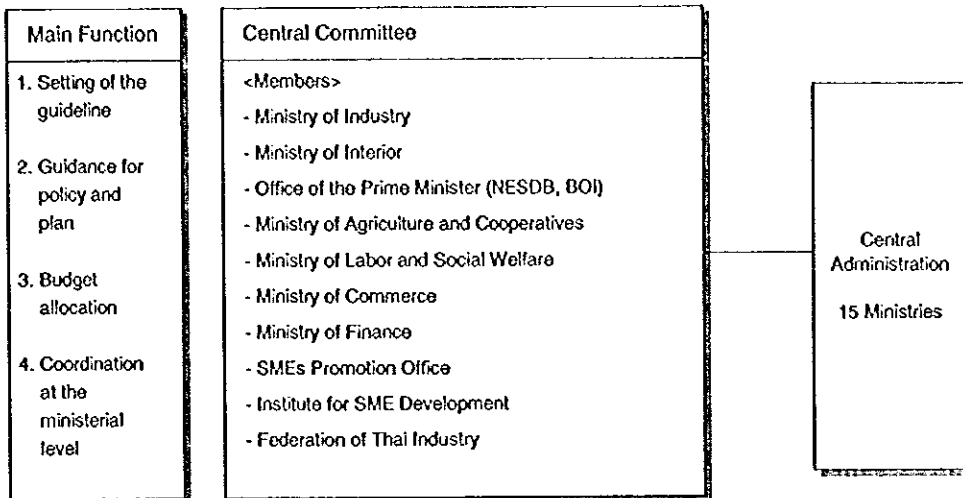
The Regional Industrial Development Office will be established as a core organization that spearheads the regional industrial development process, ranging from development planning, implementation of action plans/programs and follow-up. Based on the existing IPC, the new organization will accept contribution 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 6.3-1. 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 6.3-1. Administrative Structure for the Regional Industrial Development Committee and Offices (RIDO)

National Level



Regional Level

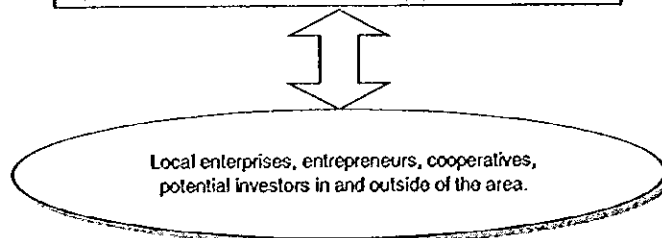
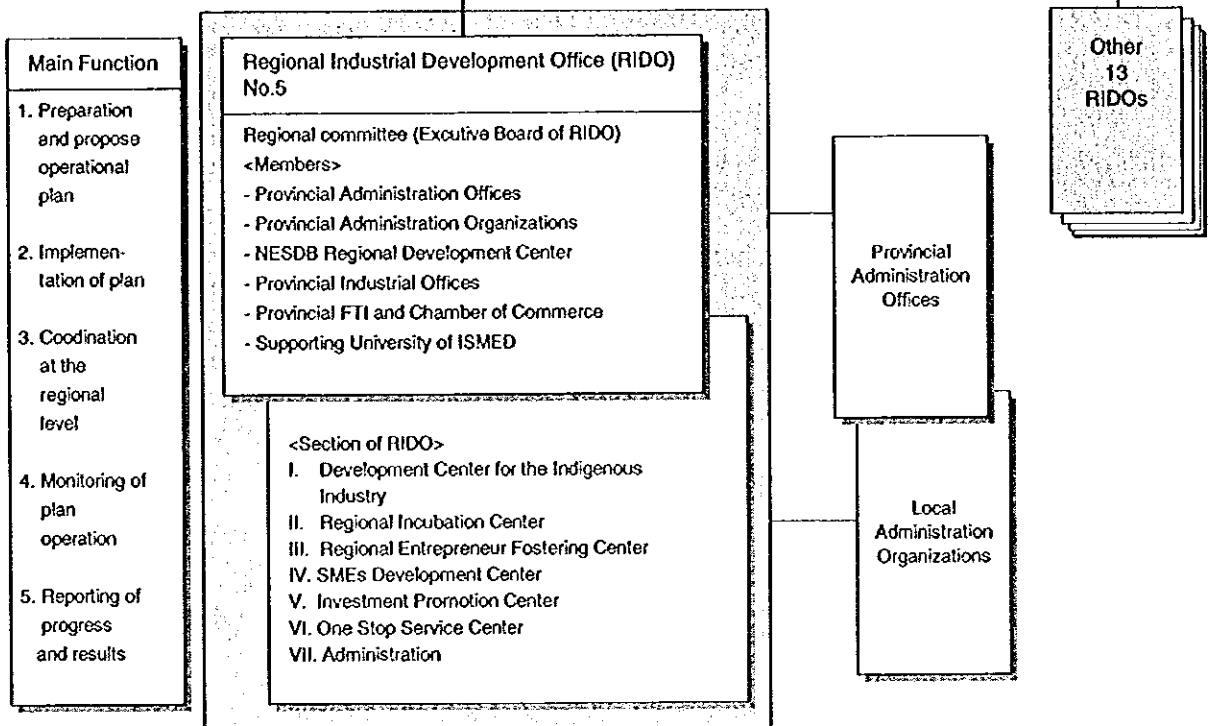


Table 6.3-1. LOCATION OF NEWLY ESTABLISHED RIDO

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 <u>Chiang Mai</u>
2. Nakhon Sawan, Uthai Thani, Kamphaeng Phet and Tak	IPC 3 (Pichit)	RIDO 2 Newly established in <u>Nakhon Sawan</u>
3. Chiang Rai, Phrae, Nan, Uttaradit and Phayao	IPC 1 (Chiang Mai) IPC 2 (Pitsanuloke)	RIDO 3 Newly established in <u>Phayao</u>
4. Phitsanulok, Sukhothai, <u>Phichit</u> and Petchabun	IPC 2 (Phitsanulok) IPC 3 (Phichit)	RIDO 4 Existing IPC 2 & 3 in <u>Phitsanulok</u>
Northeast (4 Clusters, 19 Provinces)		
5. Nakhon Ratchasima, <u>Buri Ram</u> , Surin and Chayaphum	IPC 6 (Nakhon Ratchasima) IPC 7 (Buri Ram)	RIDO 5 Existing IPC 6 in <u>Nakhon Ratchasima</u>
6. Ubon Ratchathani, Amnart Charoen, Sisaket, Yasothon and Roi-et	IPC 7 (Buri Ram) IPC 5 (KhonKhaen)	RIDO 6 Newly established in <u>Ubon Ratchathani</u>
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 <u>Udon Thani</u>
8. Khon Kaen, Maha Sarakham, Kalasin and Loei	IPC 5 (Khon Kaen) IPC 4 (UdonThani)	RIDO 8 Existing IPC 5 in <u>Khon Kaen</u>
Central (3 Clusters, 16 Provinces)		
9. Rachaburi, Samut Songkhram, Kanchanaburi, Phetchaburi, Prachuap Kiri Khan and <u>Suphan Buri</u>	IPC 8 (Suphan Buri)	RIDO 9 Existing IPC 8 in <u>Suphan Buri</u>
10. Prachin Buri, Nakhon Nayok, Chachoengsao, Sa Kaeo, Chantaburi and Trat	IPC 9 (Chon Buri)	RIDO 10 Existing IPC 9 in <u>Chon Buri</u>
11. Sing Buri, Ang Thong, Lopburi and Chai Nat	IPC 8 (Suphan Buri) IPC 6 (Nakhon Ratchasima)	IDO 11 Newly established in <u>Sin Buri</u>
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 <u>Krabi</u>
13. Songkhla, Patthalung, Yala, Pattani and Narathiwat	IPC 11 (Songkhla)	RIDO 13 Existing IPC 11 in <u>Songkhla</u>
14. Surat Thani, Nakhon Si Thammarat, Chumphon and Ranong	IPC 10 (Surat Thani) IPC 11 (Songkhla)	RIDO 14 Existing IPC 10 in <u>Surat Thani</u>

6.4 Development Strategies and Programs by Subsector

6.4.1 Agro-processing and Food Industry

6.4.1.1 Development plan of agro-processing and food industry by Provinces

(1) Nakhon Ratchasima

Nakhon Ratchasima is a representative producing area of export crops such as Rice, Cassava, and Sugarcane in Thailand. Besides those, as other agro-processing and food industries, rice use processed products and food industry targeting to large population are located there. As for fruits and vegetable processing, as many chilli, mango, jackfruits are planted in the Province (Changwat), large amount of those produce are being sold without processing such as it is. There are still a lot of possibilities to develop agro/food processing industry through further improvement of processing technology and promotion of industry vertical integration in the Changwat.

Belows are summary of development plans to promote agro-processing and food industry in the Changwat. Details are described in Section 4.2.1 in Chapter 4 of Supplementary Paper "Agro/Food processing Management". Right column number (1) to (6) indicates project or program planned for project area.

- (1) Food/Agro-processing applied research and business development Center
- (2) SME Agro-processing factory diagnostic program
- (3) Marketing support subsidy fund for Food Exposition (at Nakhon Ratchasima and Bangkok)
- (4) Establishment of Investment info center & investment matching service (agro-processing)
- (5) Industry vertical integration support (Rice, Tapioca, Dairy)
- (6) kenaf Environment Project

Nakhon Ratchasima	(1)	(2)	(3)	(4)	(5)	(6)
Rice milling						
Applied research for the use of byproducts	●					
Rice related industry (rice flour, rice cracker, rice noodle)						
Promoting vertical integration of rice and rice-related industry					●	
Applied research for rice use product development	●					
SME diagnostic program		●				
Investment information center & investment matching center			●			
Tapioca chip and flour						
Applied research and business development for tapioca use products	●					
Promoting vertical integration of tapioca and tapioca related industry					●	
Meat processing and Dairy Industry						
Promoting vertical integration of dairy and meat processing industry					●	
Applied research and business development for	●					
Animal nutrition and product development	●					
Investment information center & investment matching center			●			
Fruits and vegetable processing						
SME diagnostic program		●				
<u>This program should cooperate with existing MOAC small scale agro-processing program.</u>						
Applied research and business development for vegetable and fruits processing	●					
Marketing support subsidy fund for Food Expo (at Nakhon Ratchasima and Bangkok)				●		
Chili and Pepper processing Support project at Amphoe Don Khun Thot, Non Thai, Kam Sakae Seng.	Local Program Only					
Sugar						
Applied research and business development for the use of byproducts	●					
Consumer oriented food industry						
Applied research and business development	●					
Kenaf Environment development						
Kenaf Environment development						●

(2) Buri Ram

Rice milling, Tapioca, and Sugar are also popular in Buri Ram. In Amphoe Muang, as pig breeding is popular, there is possibility to develop meat-processing industry there. In the present, though fruits and vegetable processing as tomato juice or Chinese radish processing is small scale, as a lot of fruits and vegetable are planted near border of Cambodia, processing industry making use of those raw materials might be developed, and to sell agro/food processed products to Indo-china peninsula in Buri Ram.

Belows are summary of development plans to promote agro-processing and food industry in the Changwat. Details are described in Section 4.2.2 in Chapter 4 of Supplementary Paper "Agro/Food processing Management".

Buri Ram	(1)	(2)	(3)	(4)	(5)	(6)
Rice milling						
Applied research for the use of byproducts	●					
Rice related industry (rice liquor, rice bran oil, rice noodle)						
Vertical integration					●	
Applied research for rice use product development	●					
SME diagnostic program		●				
Investment information center & investment matching center			●			
Tapioca chip and flour						
Vertical integration					●	
Applied research for higher use of tapioca products	●					
Applied research and business development for the use of byproducts	●					
Sugar						
Applied research and business development for the use of byproducts	●					
Meat processing						
SME diagnostic program	●					
Meat processing industry support program	Local program only					
Fruits and vegetable (Fish) processing						
SME diagnostic program		●				
Applied research and business development for vegetable and fruits processing	●					
Vegetable and Fruits processing industry support program	Local program only					
Investment information center				●		
Consumer oriented processing industry						
Promote new establishment of consumer oriented factories	Local program only					
This scheme will be introduced at Bangkok through BOI or Investment information center at Nakhon Ratchasima.				●		

(3) Surin

Surin is famous for Jasmin rice in Thailand. Many rice milling and flour factories are concentrated around Amphoe Muang. Brand marketing of rice is necessary in the future. Those rice-related industry should be vertically integrated as a Surin rice center. Although fruits and vegetable processing like Chinese radish is small scale, a lot of vegetables and fruits such as groundnuts and mango are planted near border of Cambodia, processing industry making use of those raw materials might be developed.

Belows are summary of development plans to promote agro-processing and food industry in the Changwat. Details are described in Section 4.2.3 in Chapter 4 of Supplementary Paper "Agro/Food processing Management".

Surin	(1)	(2)	(3)	(4)	(5)	(6)
Rice milling						
Applied research for the use of by products	●					
Rice related industry (rice flour, rice cracker, rice noodle)						
Promoting vertical integration of rice and rice-related industry					●	
Applied research for rice use product development	●					
SME diagnostic program		●				
Investment information center & investment matching center				●		
Fruits and Vegetable Processing						
SME diagnostic program		●				
Applied research and business development for vegetable and fruits processing	●					
Marketing support subsidy fund for Food Expo. (at Nakhon Ratchasima and Bangkok)			●			
The Investment information Center and investment matching services				●		
Vegetable and Fruits processing industry support program	Local program only					

(4) Chaiyaphum

Chili and pepper commercial plantation is popular at south part of the Changwat. Thus it can develop processing industry to make use of those raw materials as local program by giving incentives to newly established

factories. Also mango processing is also possible around Amphoe Muang. Tapioca plantation is popular at south part of the Changwat. It is needed to promote higher use of tapioca products. A project of byproduct use of Sugar is also important in the Changwat. Only one factory which is making particleboard from Bagasse is located in the Changwat.

Belows are summary of development plans to promote agro-processing and food industry in the Changwat. Details are described in Section 4.2.4 in Chapter 4 of Supplementary Paper "Agro/Food processing Management".

Chaiyaphum	(1)	(2)	(3)	(4)	(5)	(6)
Rice milling						
Applied research for use of byproducts.	●					
Rice related industry (rice flour, rice cracker, rice noodle)						
Applied research for rice use product development	●					
SME diagnostic program		●				
Investment information center & investment matching center			●			
Tapioca chip and flour						
Applied research and business development for tapioca use products	●					
Promoting vertical integration of tapioca and tapioca related industry					●	
Fruit and Vegetable processing						
Applied research and business development for vegetable and fruits processing	●					
Marketing support subsidy fund for Food Expo. (at Nakhon Ratchasima and Bangkok)			●			
The Investment information Center and investment matching services				●		
Chili and Pepper processing Support project	Local Program Only					
Mango Processing support project	Local Program Only					
Sugar						
Applied research and business development for the use of byproducts	●					

6.4.1.2 Development plan of agro-processing and food industry in Project Area

Although 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, there are still a lot of possibilities to develop agro/food processing industry through further improvement of processing technology and promotion of industry vertical

integration etc. It is needless to say that Agriculture and the Related Industry will have been a main industry in project area in the future.

Belows are summary of development plans to promote agro-processing and food industry in Project Area. Details are described in Section 4.1.2 Chapter 4 of Supplementary Paper "Agro/Food processing Management".

(1) Food/Agro-processing applied research and business development center

Project profile: Although this project area has a plenty of agricultural resources, applied technology for processing those resources and the business application are not well developed yet. For that, Food/Agro-processing Applied Research and Business Development Center (ARBDC) should be established for leveling up processing technology, developing new products, and applying the new technology and products into business. This ARBDC will have two units. Those are: applied research and business development.

Applied Research Unit will have 5 sub sections:

- 1) Applied research for tapioca products
- 2) Applied research for byproducts (Rice husk, rice bran, Baggase, Mud etc.)
- 3) Development new products for vegetable and fruits processing
- 4) Development for rice use products
- 5) Development of biodegradable products (Corn fiber, Polycethtel)

The unit will research above five items. Developed technology and products will be transferred to local processing factories through Business Development Unit in cooperating with sales and marketing activity. Therefore, both units will invite researchers and sales persons from private sectors. Developed technology and products will have fruitful results through selling those products in real market.

Common dogma for five themes are;

- 1) Not ready-made but specific research for developing new product and technology
- 2) Apply developed technology and products into real business

- 3) Subsidize R&D cost for processing factories, which try to develop new technology and products by themselves
- 4) Have both functions product development and sales & marketing of new technology and products

Also this center accepts the request for product development and consignment of research and product development in case they are worth to do.

Time Schedule: 2001 formulate detail implementation plan 2002 start the project

(2) SME Agro-processing factory diagnostic program

Program profile: This program diagnoses each agro/food processing factories, advise and instruct methods to improve technology, management, quality control, marketing in responding to each situation of agro/food processing factories.

The diagnostic process is:

- 1) Enlightening corporate diagnosis through seminars or workshops to local agro/food processing factories
- 2) Collecting applications for diagnosis from SMEs and approaching them to join the program
- 3) Implementing corporate diagnosis (material procurement, processing methods, processing technology, factory layout, product development, marketing, human resource management, general management) to SMEs, advise and instruct points to improve based on diagnosed results.
- 4) Patrolling and monitoring activities of SMEs for three times a year.

Time schedule: From year 2001, 10 experts (for rice use processing, tapioca processing, vegetable and fruits processing, dairy) start corporate diagnosis and instruction for SMEs.

(3) Marketing support subsidy fund for Food Exposition (at Nakhon Ratchasima and Bangkok)

Program profile: Government subsidizes participation fee at Food Exposition at Nakhon Ratchasima and Bangkok for processing factories and promotes to advertise local products. Participation fee will be discounted at from 30 to 40 thousands Baht to 5 thousands Baht. The program also provides a service that each joining SMEs can consult ways of displaying and advertising products to private marketing for free. By this program, SMEs, which has not ever participated in such Expositions will be able to display their products at Exposition.

Time schedule: The scheme of program is applied to FOOD EXPO, which is to be held in 2001.

(4) Establishment of Investment info center & investment matching service (agro/food processing)

Program profile: This center provide following investment & market information and investment matching services for agro/food processing factories:

- 1) Providing market information such as popular and trendy products, product design, market price of products, competitors etc. from Bangkok and overseas.
- 2) Introducing local products and resources available to investors and intermediate investment matching between investors and local companies.
- 3) Introduce local products at overseas markets especially to small and medium size trading companies, which are promising investors.
- 4) Setting up branch offices of the center in Bangkok, Hong Kong, and Singapore to smooth promotion activities of the center.
- 5) Experts instruct product quality and design, which are required at overseas markets to local companies.
- 6) Giving practical training courses to local companies to learn product design and quality and to develop original products by themselves.

- 7) Make arrangements locally made products and introduce them on pamphlet or catalogue of the center.
- 8) Supporting to advertise products through E-commerce, and also advertising local products on Internet home page of the Center.

Time schedule: 2001 Establish the Investment Information & Investment Matching Service Center

2002 Put necessary information for starting the Center in order, decide detail function of the center, request cooperation to related agency, organization, and start E-commerce to advertise local products. 2003 finding potential investors and posting three counselors in the Center.

(5) Industry vertical integration support (Rice, Tapioca, Dairy)

Project profile: This project supports industry vertical integration from farm gate to first and second processing factories so that agro and food processing factories using same source of materials (Rice, Tapioca, Meat, Milk) can share information and materials more efficiently.

If new factories are established in designated Amphoes and use local materials at more than certain level, local government gives privileges such as free factory lot, local tax reduction, SIFC low interest loan to factories.

Program coordinators mediate mutual integration between factories to be able to share processed or by products.

Time schedule: For three years from 2001, program subsidizes tax reduced and interest compensated parts, and from fourth year, this program aims that local government and SIFC themselves put this program in practice.

(6) Kenaf Environment Project

Project profile: Promoting kenaf plantation and use as raw materials. Finally aiming at building pulp industry base by non-mood pulp for the first time in the world.

- 1) Deliver kenaf seeds to farmers for free and give extension service for planting. Improve Yield from 1.5 ton to 10 ton per rai.

- 2) Use it as high quality pulp or textile material. For that, be consistent to separation process of skin and stem at farm level.
- 3) Use it as fiber, and make it use for artificial flower, high value added products.
- 4) Promote production of high quality pulp in cooperation with existing pulp factory.
- 5) Applied research for food use of kenaf, for example: Its leaves contains more Vitamin A and Calcium than Spinach and apply the result to business and for water purification (phosphorous and nitrogen)

It has been proven that kenaf has air purification effect that it absorbs CO₂ five times as much as redwood can do. By using this function, it will be possible to procure huge budget through trading of CO₂ emission right from global capital market in the future.

Time schedule: 2001 Start project, understanding merits of kenaf as multipurpose projects and selecting projects. 2002 Implement selected projects.

6.4.2 Machinery and electric/electronics Industries

In the provincial cluster, the machinery and electric/electronics industries are concentrated in Nakhon Ratchasima. However, it is difficult to predict that the concentration will extend to other three provinces and forms an industrial zone with Nakhon Ratchasima as the core. The area will continue to attract investment by foreign firms, but it will not help foster local suppliers. A strategic direction for development of these subsectors in Nakhon Ratchasima is established on the basis of this recognition.

Unlike Bangkok, the machinery and electric/electronics industries in Nakhon Ratchasima are characterized by a high degree of specialization. While Bangkok is dominated by assemblers of household appliances, manufacturers of precision parts for office equipment (e.g., magnetic heads) and automobile engines are thriving in Nakhon Ratchasima to form a major supplier base. They have recently started operation and are designed to make highly precision parts for high-tech products. Nakhon Ratchasima will continue to attract these

manufacturers because of its locational advantages. As the area is strategically located to serve as a technology center for other Indochina countries, it needs to attract technology companies and incubate and maintain technology resources all the time. The marketing and design center, as proposed here, will become a major vehicle for such efforts by promoting the development of export markets for manufacturers that operate in the area. As pointed out earlier, marketing and design play an increasingly important role not only in development of the electric/electronics industry, but also in evolution of traditional industries, such as woodworking, textiles, and ceramics and porcelain. Design is and will be a critical factor in market development by creating products that appeal to the special market needs in terms of color, shape and form (which reflect lifestyles and tastes of consumers). In other words, design should be utilized as a primary tool for product development, in addition to technology. In fact, design has been proven to be a powerful driver for industrial products to explore new markets (as seen in the success story of bus assembly).

Another important aspect of the development strategy is the underdevelopment of the local supplier base despite the presence of many foreign manufacturers. There is virtually no supply chain formed between export manufacturers and local suppliers. To develop the inter-industrial linkage that is essential in promoting the regional industrial development process, the study team proposes the use of the two-step contract scheme. Nakhon Ratchasima is a large market for local suppliers. The major issue is their inability to sell products to potential customers, export manufacturers that operate volume production lines. The two-step contract scheme is designed to bring the two parties closer by offering incentives for export manufacturers on one hand and nurturing local suppliers with formal technical assistance projects on the other. As their relationship evolves to a mutually-beneficial supply chain, our primary goal - regional industrial promotion - will truly be achieved.

Meanwhile, high levels of production technology used by manufacturers in Nakhon Ratchasima require continuous supply of skilled work force - higher skills than those in Bangkok. For this reason, it is proposed to establish a vocational training center to teach highly precision processing techniques and skills, particularly operation and maintenance of NC machines, CAD systems

for dies and molds, and printed circuits. In fact, the ability to supply adequate human resources is an essential factor in fostering local industries on a sustainable basis. These proposals are discussed in Nos. 9 and 18 of Project Details in Annex. In particular, the study team believes that the two-step contract scheme is considered to be highly recommendable for the electric and electronics industry because it is expected to produce the tangible effects in the short run.

6.4.3 Other Industries

(1) Ceramics

As production of ceramics requires pot earth, e.g., clay and sand, it always develops in an area where adequate materials are available nearby.

In the Dan Kwian district, pot earth containing iron oxide is widely available and used to make ceramics having a reddish color peculiar to the producing area. It is considered to be a valuable historical heritage and the ceramics industry in the area must maintain the traditional production techniques and disseminate them through their products if they are to survive in the changing market. It is therefore imperative to establish the industry's value (pride) as a unique production center before launching any promotional measures. For this purpose, the following efforts are recommended.

1) To affix the mark certifying the area of production to each product

This helps differentiate products of Dan Kwian from others. Needless to say, the marking alone does not result in product differentiation. Unique designs will determine the success in the market. Products similar to those made in other areas do not create any advantage but have to compete only on price.

2) To establish the quality assurance system

To increase sales revenues, one strategy is to sell volume products at lower prices. However, to establish market presence as a unique production center, the ability to supply high-grade products is critical. In consideration of the brand value accompanying the historical ceramics production center,

development of high-grade (value added) products is recommended as the means to secure sales revenues from premium prices, rather than volume sales. As quality assurance should be given of priority in this strategy, the industry should establish its own organization responsible for product inspection.

In addition, efforts should be made to maintain long-term relations with customers by offering maintenance service and advice for selected products.

3) To promote inheritance of skills (certification of traditional craftsman)

While volume products are expected to maintain a certain level of quality and workmanship, high grade products must be made by skillful craftsmen. This means, their quality is personalized. To recognize excellent craftsmanship as the industry's heritage, experienced craftsmen should be rewarded with the title "traditional craftsman" and are encouraged to teach and train their successors.

4) To provide a permanent facility to display products, including a place of hands-on experience for tourists and ceramics enthusiasts.

It is important to provide opportunity for general consumers to experience the actual making process by touching pot earth and getting a feel of pottery making techniques, which will strongly appeal to visitors.

5) To promote mechanization

The potter's wheel is always used for formation of cylindrical products. In Dan Kwian, rotary tables are widely used. They are rotated by assistants and require two people to make products. It is time to introduce a mechanism to rotate the wheel automatically.

In rural areas of North, the potter's wheel is not used and blanks are formed manually. It is desirable to introduce a mechanical system for modernization of the industry.

6) Research and educational institution – Khorat Ceramic Materials Research and Development Center

At present, there are public research institutes in Lam Pang and other areas. However, as ceramics are made from pot earth available in a particular production area, production techniques unique to the area are developed and maintained. As a result, some concern that experts who have indigenous techniques in other areas cannot provide accurate advice for producers in Dan Kwain. It is recommended to establish an organization that conduct research and provide guidance for pottery making in Northeast and Khorat.

(2) Silk textile

Silk textiles are positioned as a key item of traditional handcraft. The proposal for promotion of the industry follows the same policy applied to ceramics in the preceding section.

1) To establish a formal system to certify traditional craft products

It is important to establish a formal system to recognize traditional craft products that are considered as the country's historical heritages and to provide public support for their preservation and promotion. Silk textiles are a primary candidate for the certification system. In particular, products from Pak Thong Chai are considered to be valuable craft products.

2) To establish an inspection facility

Jim Thompson is highly reputed because of its strict quality check, which warrants high levels of customer satisfaction. Their products are more expensive than local products that are equivalent in quality, they appeal to tourists. Design also contributes to this. The quality control practice should be followed by local manufacturers.

The inspection facility will check product quality according to specific standards and authorize products which pass the test to bear a certification mark for the traditional craft product.

3) To certify the traditional craftsman

Craftsmen who meet a specific set of qualification requirements will be certified as the traditional craftsman. Financial support will be provided for education and training of candidates.

4) To establish an exhibition center and a workshop

The facility needs to be provided within a building of adequate size. It is recommended to use the exhibition center in Pak Thong Chai, which is currently not in use.

The facility can also be used for exhibition of ceramic products.

5) To conduct research on machine weaving

At present, Ikat, the silk textile that requires the highest skill, is woven by female workers. While manual weaving has its own value as a cultural heritage, it is time to develop machine weaving techniques to explore opportunity for modernization in the future.

6) To establish a permanent organization for research and guidance – Pak Thong Chai Silk Textile Technology Center

In Khorat, the Sericulture Research Center, built under the assistance of JICA, has been operating to breed improvement for 25 years. The Silk Textile Technology Center will be established by upgrading facilities and other resources of the existing center.

From the standpoint of fostering local industries, the following programs are recommended.

Diagnosis of traditional production centers

In Northeast, a variety of industries are locally concentrated, including processing of farm products, food processing, electrical/electronics, ceramics, textiles, machinery and metalworking, and household goods. To prescribe a strategic direction of future development for each industry according to the

business environment that varies greatly among them, their formal evaluation will be conducted by experts.

The diagnosis will be conducted for the following two types of industrial clusters:

- (1) The cluster characterized by family industries and representing the concentration of industries manufacturing traditional products
- (2) The cluster of industries other than traditional manufacturers, covering all the industries in each province.

Small Enterprise Relief Fund

As part of efforts to revitalize small enterprises en masse, it is proposed to provide financial assistance for startups and ventures, including young and female entrepreneurs.

This program is designed to establish a small enterprise relief fund under the spirit of mutual aid. While it is desirable to deploy it throughout the country, the initial stage should focus on small enterprises in Khorat.

In addition, childcare facilities will be provided to create employment opportunities for potential female workers in the region. Workshops will be established in Khorat to make products using raw materials from the BMR. In fact, the IPC8 in Supanburi has successfully started assembly production of leather products such as handbags under this arrangement. A similar venture is viable in Korat and the BISD's Interior Design Department is developing a business plan.

6.5 Supporting Strategies and Measures for Regional Industrial Development

In terms of further industrial development in the target provinces, this chapter describes about supporting strategies and measures on the institutional build-up and development of infrastructure.

6.5.1 Financial Supporting Measures

(1) To prepare industrial finance scheme

“Commercial finance - short term finance for working capital” is prepared but “Industrial finance - medium and long term finance for investment capital” is not prepared in Thailand. Investment capital (fund for investment in plant and machinery) needs a fund with cheaper interest rate and longer repayment period. Concretely speaking, the interest rate is better to be 4 ~ 5% p.a. and repayment period at least 10 years after some grace period. However, no financial institutions, whether governmental or private, extends such sort of fund in Thailand. The provincial industrial development is a part of industrial development nationwide, however, a few financial supports have been taken for provincial industrial development so far.

Only one exception is a revolving fund facility implemented by IPC and PIO of MOI but it has some problems that anybody cannot utilize this facility because its size of capital amount is too small and its objective is to develop handicraft and cottage industries. It is quite necessary to prepare industrial finance scheme as soon as possible and thereby to progress industrial development in a nationwide scale which is indispensable for the sustainable development of the national economy.

(2) To prepare the regional industrial development fund

It is a provincial community to enjoy the most benefits through provincial industrial development. Provincial Administration Organization and Office (PAO), therefore, are thought to have to make proper efforts and take initiatives for this purpose.

However, PAO representing the provincial communities have never taken any financial measures for industrial development in their provinces due to lack of fund and shortage of staff and waited for materialization of the measures related with industrial development in their province which decided and implemented by the central government. If the same attitudes are kept taking from now on, it seems to take long for materialization of the provincial industrial development.

The PAO recognize necessity of industrial development in their provinces. If so, it is advised that they should think what it can do for their industrial development under the given conditions. That is to say, to think out the ways to make and secure financial resources and to use it for their industrial development. The details of this idea are described in Project 9 in Annex I. "Detail Plan of Project/Program".

But it seems to take long to prepare and operate this system. In the meantime, it is advised for the provincial societies to work out system or way to supplement the business of the financial institutions which the provincial societies (e.g. A special committee for SMEs development) can do for industrial development in their provinces under the current systems and environments - Issuance of Recommendation Letter by the provincial societies addressed to the financial institutions on the project which is considered to contribute to the provincial industrial development. The details of this idea are also described in Project 28 in the ANNEX I.

(3) To strengthen financial schemes to micro-scale enterprises

There are many potential micro-scale enterprises in the four target provinces. To develop these enterprises is considered contributory to industrial development in the related areas. Some enterprises, however, have suffered from raising the necessary fund for procurement of raw materials and renewal of the machinery. The volume of the fund is around 100 to 200 thousand Baht.

Under the current system BAAC and GSB can extend loans amounting less than 100 thousand Baht. But BAAC is restricted to extend loans to only farmers and agricultural cooperatives. On the other hand, GSB can extend

loans to non-farmers but is limited to extend loans to depositors up to five times of their saving amount. It is desirable to strengthen the financial schemes for micro-scale enterprises which are expected contributory to regional industrial development. From this viewpoint, strengthening of SIFC's function and diversification of their financing program should be promoted in the region.

(4) Amplification of SMEs Financial Advisory Centers (SFACs)

SFAC's provincial office was opened in Suranari University of Technology in Nov., 1999 and is to exercise jurisdiction over the target four provinces. But its staff is only 4 and the numbers of staff seem insufficient to provide financial advice to SMEs in four provinces. Moreover, SFACs are said to operate for two years.

Taking into consideration some comments on SMEs by the financial institutions and comments on the finance by SMEs heard during the field survey, the activities to be done from now on by SFACs opened in the whole country are expected to be quite useful.

Staff of SFACs is not permitted to be seated in the office waiting for SMEs coming. They are requested to visit SMEs in the districts of their jurisdiction, understand their present financial conditions and respond to their financial consultations.

As SFACs have to perform such service activities that takes times and troubles, it is desirable to increase the number of staff as soon as possible and to re-consider the SFACs' life of two years.

6.5.2 Investment Promotion Measures

Investment promotion is considered to be one of the most effective measures to accelerate industrial development in rural regions by producing tangible results in the short run. However, there are a number of factors that impede effective promotion of investment in the provincial cluster, which can be reduced to the following three issues:

- (1) Lack of a well-defined investment promotion strategy, plan and organization developed under the initiative of local communities and residents;
- (2) Lack of incentive for small-scale investment projects; and
- (3) Lack of integrated and networked investment information sources

These issues, which background is discussed in 2.2.4.2, have been identified as core elements of various impeding factors for investment promotion. To address and overcome these issues, the study recommends the following improvement measures. Note that some recommendations are proposed as projects, which are also described in Chapter 7 and Annex I.

- (1) Accelerated promotion of investment by the Regional Development Council and Regional Industrial Development Office

The Regional Industrial Development Office will be established under the leadership of local communities and residents and will be empowered to lead investment promotion activities. The Regional Development Council will set forth basic policies and strategies for attraction of investment to the region, based on which the Regional Industrial Development Office will plan and implement action programs. In this conjunction, it is recommended to consider the region's own incentives directed to particular types of industry and investment that are aligned with the regional development strategy. These activities should be carried out in addition to investment services provided by the BOI's local branch and under the strong leadership of the Regional Industrial Development Office that will take initiative in planning and implementing actual promotion activities. The initial focus should be placed on investment seminars to be held in the BMA in order to promote the area and its investment climate in cooperation of the FII and foreign chambers of industry and commerce. In the future, the scope of activity should be expanded to overseas under the alliance with the central government and/or foreign trade promotion organizations such as JETRO.

- (2) Adjustment of BOI's investment promotion criteria

The BOI is currently designating specific areas for investment promotion as part of its efforts to encourage investment in rural areas. Also, it gives incentives for investment projects that utilize locally available materials or contribute to economic development outside Bangkok. To become eligible for the BOI's approval, however, the minimum amount of investment is set at one million baht, regardless of the type of industry or the geographical area (not including land cost and working capital). As a result, most of projects in rural areas are not eligible for tax and other incentives because they fail to satisfy the BOI's criteria in amount of investment. For this reason, the BOI is criticized by local investors that it primarily serves the interest of a small number of large corporations and foreign firms. To make the BOI's ongoing efforts to promote investment in rural areas more effective, its evaluation criteria should be adjusted by lowering the minimum amount of investment for specific industries, e.g., light industries in Category 3. Also, existing incentives should be modified to accommodate the needs of smaller projects.

(3) Development of integrated information sources

This is essentially an issue to be tackled by the BOI and the Regional Development Corporation. In particular, an emphasis should be placed on the development of information sources in the local area. At present, information related to investment opportunities for rural regions is held by a variety of government organizations in a highly fragmented way. In fact, Northeastern Region Investment and Economic Center 1, Nakhon Ratchasima appears to serve primarily as a gateway to the dispersed information sources, rather than a center to store, assort and disseminate information on the region's investment opportunities. As a result, large amounts of information are simply stockpiled without effective linkages, and information sources are not integrated nor networked. The BOI is currently working on integrated information management. It is important to note that information management should be carried out in such way to serve the best interest of the region by helping its own investment promotion efforts, not the BOI's led project under its centralized planning and implementation. In particular, as the Regional Development Corporation is expected to play a

central role in investment promotion activity, it should be actively involved in developing integrated information networks.

6.5.3 Technical Support for Production and Management

Problems of technical support in the four provinces are mentioned in 1.2.5.4. Here, the proposal for the improvement of technical support in the four provinces is explained putting focus on the institutional as well as organizational aspects.

In order to improve technical support for production and management in the four provinces, the following should be done.

- a) Strengthening of IPC in terms of its administrative capacity
- b) Introduction of new functions to IPC
- c) Coordination with other government agencies for service delivery
- d) Coordination with the private

6.5.3.1 Strengthening of IPC's Administrative Capacity

In order to improve administrative performance, IPC has to increase flexibility, respond its clients quickly and provide appropriate service in response to each client's needs by increasing its administrative capacity. Administrative capacity will be increased by increasing qualified staffs, acquiring business management skills and developing resource person database in IPC. In addition to that, IPC can prioritize its activities by conducting studies on technical support needs in the provinces to be covered. Moreover, the direction of IPC's technical support becomes clear by developing its regional industrial development plan based on support needs studies. That will also contribute to improve administrative performance of IPC.

(1) Increasing Qualified Staffs in IPC

The formation of IPC staffs should be reconsidered. IPC needs to have more personnel with analytical skills, instead of clerical workers. Although the number of IPC staffs is not so small when temporary employees are

included, administrative staffs with enough qualification to perform expected functions of IPC are limited.

(2) Acquiring Business Management Skills in IPC

IPC needs to acquire business management skills in it. Most of the current IPC staffs are administrative personnel of the government without business management skills. Without having such skills, they cannot fully conduct supporting needs study or situation analysis of local companies for preparing appropriate technical support.

There are two ways of acquiring business management skills in IPC. One is to train IPC staffs in business management skills. The other is to employ experts in IPC in addition to administrative staffs. In the short run, employing or utilizing experts for offsetting missing business management skills is recommended. In this case, IPC staffs work with experts for developing technical support plans and providing clients with support service including consulting and advisory service. In the long run, IPC staffs should learn business management skills so that they can understand well and analyze the conditions of client companies.

(3) Developing Own Resource Person Database in IPC

IPC should create and develop its own list of resource persons for formulating its support programs. That is because the performance of technical support programs are heavily dependent on the experts or instructors who run the programs. IPC needs to have ideas for instructors suitable for each topic in formulating technical support programs in response to client needs.

For formulating the own resource person database, IPC should evaluate performance of experts and record the evaluation results, every time it hires experts. When the data are accumulated, the record becomes IPC's own database of resource persons. IPC will be able to refer the database for finding appropriate experts for specific issues it handled in the past.

There are some ideas of utilizing a database developed by others for finding experts. However, such a database tends to be ineffective because there is no one responsible for the reliability of it.

(4) Analyzing Technical Support Needs through Needs Study

In order for IPC to provide its technical support effectively with its limited budget, it needs to prioritize areas of technical support. It is necessary for IPC to know training as well as consulting needs of clients, first. Intensive discussions with local companies and study visits to their production sites are required for IPC staffs to know technical support needs. Then, analysis of the needs and formulation of technical support programs should be done. Problems of local companies will change as time goes by. Therefore, technical support programs should be formulated not from the management theories but based on the analysis of actual client needs.

(5) Developing a Regional Industrial Development Plan

When technical support programs are integrated into the regional industrial development plan and combined with other supporting measures such as financial support, the impact of the programs will be strengthened. Also, by having quantitative outcome indicators as the targets for providing technical support programs, performance of the programs will be improved because the difference between planned and actual performance becomes clear.

6.5.3.2 Introduction of new functions to IPC

New functions regarding technical support for production and management should be added to IPC. They are incubation and initial advisory and consulting services. The incubation service is to provide entrepreneurs with office facility and testing / basic equipment at a low cost and free advisory service.

Apart from the incubation service, initial advisory and consulting service should be introduced. Although IPC is currently providing consulting service under the IRP program, the service is on the project basis and not a basic function of IPC. The initial advisory and consulting service should be

a basic function of IPC operated by its annual budget. This service provides each client with a brief diagnosis on the company operation, so that the client and IPC can take further action to solve problems in the company. Once the core problem is pointed out by the service, appropriate experts or consultants can be specified for problem solving. In the long run, Enterprise Evaluators trained by BSID's Enterprise Evaluator Training System may be available for this service. However, the training is still in process. It will take time to fully implement the initial advisory and consulting service in IPC.

6.5.3.3 Coordination with Other Government Agencies for Service Delivery

In order to find resource persons, IPC needs to ask for assistance from other government institutions such as BSID, BIRD, BIED, ISMED, EEI, AI, TI, TPA, FTPI and so forth. Currently, communication channels with those institutions are not strong. IPC needs to intensify information exchange with them, and should involve them more in its technical support programs. Here, one of the strengths of IPC6 is the existence of SUT. Although SUT is not a government agency, it has human resource useful for IPC's technical support programs and is participating in the network of ISMED.

6.5.3.4 Coordination with the Private Sector

Inputs from the private sector to the technical support programs of IPC are important. There are two kinds of inputs from the private sector. One is in the form of technical support needs, and the other is expertise in production and management technologies. FTI and CC will play an important role for such inputs. IPC needs to coordinate with the private sector with the assistance of FTI and CC.

The measures for improving IPC's technical support for production and management is to be further described in the proposed projects such as Project 1 Establishment of Regional Industrial Development Organization, Project 6 Diagnostic Scheme for Production Centers, and Project 13 Establishment of Rural Incubation Center.

6.5.4 Human Resource Development

Human resource development is a key for the industrial development of the four provinces. The scenario proposed on the human resource development in the project area consists of three components.

- a) Development of leaders for regional industrial development
- b) Development of industrial human resource in the region
- c) Development of human resource for regional industrial development support

Because there are different development needs for each component, the focus of human resource development varies by component. However, all the three components are important for the project area to develop industries in it.

6.5.4.1 Development of Leaders for Regional Industrial Development

The leaders for regional industrial development belong to either the public sector or the private sector. They may be politicians representing the region, bureaucrats in the provinces or representatives of the industrial sector such as the board members of the industrial federation. In the case of the project area, the bureaucrats in the four provincial governors' offices, the core members of FTI in the provinces are the major target group falling in this component.

What the leaders need to learn is how to connect their region to the industrial development. The leaders need to have a clear development vision to be shared by people in the region. For example, for developing industries, the core of the development vision can be a product to be sold in the market as a special product of the region. By concentrating available resources into the developing activities of such a special product, industries basing on the product will be able to grow. Therefore, it is important to develop products to be sold in both internal and external market. However, creating a mindset to develop such special regional products among the people is more important. The leaders need to convince, encourage and motivate people to take actions. That is the role of the leaders. The master plan proposes Project 5 Introduction of One Village One Product Movement for this purpose.

Leaders can also learn from the cases of industrial development in other regions. For this purpose, study trips to abroad on regional industrial development are effective. In order to increase value of the study trips, preparatory studies for the places to be visited are necessary. Such preparatory studies include historical, cultural, social and economic aspects.

6.5.4.2 Development of Industrial Human Resource In the Region

(1) Immediate Actions Needed

For developing industries, the four provinces need to take immediate actions on two aspects, regarding industrial human resource development. One is development of top managers and entrepreneurs in terms of their quantity and quality, and the other is development of good quality workers.

If top managers and entrepreneurs are educated and brushed up, number of new business development in the four provinces may increase. Presently, the number of companies in the four provinces is limited and growing too slowly except for Nakhon Ratchasima. The static corporate environment in the project area spoils indigenous companies and weakens their competitiveness. Then, the low competitiveness of the companies further contributes to the slow down of industrial development. In addition, limited number of job opportunities as a consequence of little industrial development results in outflows of labor force from the provinces. That is why the four provinces need to increase strong, energetic top managers and entrepreneurs. For this purpose, the master plan proposes Project 3 Introduction of Top Executive Seminar Program, Project 11 Development of Entrepreneur Fostering Program (EFP), and Project 50 (Tentatively numbered) Management Transformation Program from Micro Scale to Small Scale Company.

With regard to workers in the four provinces, there is a serious problem. Although the workers in the Northeast region have a reputation as hard-workers, their educational background is considerably low. Therefore, their basic comprehension will not be enough to be an efficient labor force in the future when international business competition becomes fierce. Here, basic

comprehension means the ability to handle the subjects such as mathematics and science. Since upgrading of unskilled labor force in terms of basic education takes time, this requires an immediate action. Although such needs on this aspect are noted and an immediate action is recommended, no project is proposed because this is the matter of the country's entire basic education. The other immediate development need on workers is to change their work attitudes or daily practices from the rural and agricultural to the industrial one. Here, the rural and agricultural work attitude means the attitude easily affected by natural conditions such as the weather with neither punctuality nor observance of work schedules and company rules. The industrial attitude means the disciplined one with punctuality and observance of agreed rules with employers. It may be possible to change workers attitudes by social education through the training programs such as the PRID programs. Project 23 Expansion of PRID Programs will contribute to the required change in workers' attitudes.

(2) Secondary Actions Needed

1) Human Resource Development for Middle Management and Technical Staff

Middle managers and technicians can be educated and trained through OJT, graduate programs in universities and programs of training institutes, when top managers know what they need to do for training of their subordinates. Vocational schools and technical schools are also available in Thailand. However, many students of such schools are mentally too young to be responsible employees, and want to continue their higher study instead of working just after graduation. Moreover, this is also the matter of the country's education program, there is lack of education program to enhance creativity and originality in Thailand. As a consequence, those schools are presently not effective enough to provide candidates for middle managers and technicians. Moreover, many of school graduates tend to go out to seek jobs from their home villages under the current situation of limited job opportunities in the project area. Therefore, introducing new training projects for middle managers and technicians in the project area may not be effective at present.

Based on the analysis above, it should be realistic for companies in the project area to recruit candidates for middle managers and technicians from the Bangkok area instead of developing them in the project area in the short run. In the long run, training for middle managers and technicians should be promoted in the companies in the project area by educating top managers on the necessity of such training.

However, Nakhon Ratchasima is an exception within the project area in terms of the necessity of training for engineers and technicians, because the province is rapidly changing into the leading high-tech industrial center of Thailand. Engineers and technicians of high-tech industries in Nakhon Ratchasima have no more places to learn on the high-tech frontier in Thailand for their further technological upgrading. Under this situation, the engineers and technicians of high-tech companies in this province have to keep up with the technology improvement of the world so that their companies can survive in the rapidly changing technological environment. For this reason, Project 16 High-tech Human Resource Development Program in Nakhon Ratchasima is proposed. However, such training programs will be utilized only when top managers of their companies understand the value of the programs. Again, that is why the education of top managers is the first priority in the industrial human resource development in the project area.

2) Human Resource Development for Senior Workers

Workers in production lines need to grow as trained senior workers through both OJT and Off-JT. The workshop results indicate that there are few skilled workers in the project area. The skilled workers in this case do not necessarily mean workers with special technical skills, but rather senior workers who well understand regulations in their factories, their production processes and assigned tasks so that they can perform their tasks appropriately. From the viewpoint of top managers, factory management becomes easier with such senior workers because they can tell what they should do without detailed instruction and intensive supervision. In this sense, some worker education programs for transforming junior workers into senior will be useful.

For this purpose, Project 37 Worker Education Program is proposed. This program is to upgrade workers by training on critical requirements for working in the factory and a good way of work. However, such training should be provided by the cost sharing between the beneficiary companies and IPC. That is because top managers' commitment on the training of their workers is necessary for the training's success. Top managers' willingness to pay training fees for their workers shows their commitment to the human resource development in their companies.

6.5.4.3 Development of Human Resource for Regional Industrial Development Support

In order to make the regional industrial development happen, it is necessary to upgrade administrative as well as technical support competence in industrial development support institutions in the project area. This is the human resource development targeting for organizational development of such institutions. Administrative staffs and local experts for technical support needs to learn how to conduct industrial development support activities effectively and efficiently through technology transfer by experienced foreign experts. For this purpose, there are Project 2 Establishment of Agro/Food Processing Research and Business Development Center, Project 7 Establishment of Marketing and Design Center, Project 13 Establishment of Rural Incubation Center, and so forth. Those projects may not necessarily be considered as the introduction of new institutions, but rather they should be considered as the introduction of new development support functions within and / or outside the existing institutions.

The other important human resource development activity on industrial development support is to promote an intensive information exchange among the private and public sectors by creating opportunities for discussion on the industrial development. With the information exchange, administrative staffs and experts of development support institutions can learn the needs of the regional industrial society for the development support. One of the purposes of Project 1 Establishment of Regional Industrial development Organization is to promote information exchange between the private and public sectors.

6.5.5 Supporting Infrastructure

(1) Transportation System

Currently, highway sector occupies the almost all part of the land transportation in both passenger and freight. Since the plan and budgetary allocation for highways are prepared at the national level, the local governments have little involvement in the highway sector. Consequently, the Department of Highway set priority in terms of national goal and interregional space structure rather than the local needs to promote industrial development.

The trucks and railways have carried the traditional bulky agricultural products such as rice and tapioca. Contrary to it, the products by new factories are carried by containers for export and import.

The present situation above, the priority should be provided to deal with containerization within the region. In this sense, establishing an inland container depot (ICD) meets such priority. This study recommends the ICD project as the most important transportation project.

As the development of industrialization, the products and input materials will be required to carry by air. Current civil aviation system provides only two airports in the four provinces. However, the flight frequency is not enough to operate the airport authority in the black. At this moment the air transportation has lower priority than road transportation development. This study recommends the air transportation development in the next stage of industrialization.

(2) Utilities

Here refers utilities of electricity and water. These utilities are indispensable element to operate factories in certain types.

Due to the limitation of natural resources, the water supply in the region is very restrained in both surface and ground water. The water consuming type of industries are not recommendable in the regions. On the other hand,

supply system of industrial water and its resources should be developed for further development of industrial sector in the region.

Because the national grid system covers the regional power transmission, the local needs are difficult to be reflected in the national level project. For the industrial power users, the most significant needs are to improve reliability. The occasional but not frequent blackout and brownout influence the production process in the factories. This study recommends Provincial Electricity Authority (PEA) to communicate local industrial users on scheduled bases.

(3) Telecommunication

Although the number of waiting list has decreased dramatically by the concession scheme, the low quality of subscriber telephone line still remains as a problem of telecommunication in the region. The telecommunication service providers tend to provide many types of new services with advanced technology but telephone users require more reliable telecommunication. There is such a gap in the telecommunication service, that sector has large misperception between users and providers. Telephone service providers are recommended to improve reliability in local cable network rather than creating many menus.

The information technology in telecommunication, especially the Internet, directly connects the industries to the outside market including the world. The current Internet usage is still limited to web browsing and e-mail. To mobilize the Internet to industrial use, the more software engineering firms will be required within the region.