4.2 Company Surveys by Questionnaires

4.2.1 Methodology of Company Surveys by Questionnaires

For the purpose of company surveys by questionnaires, initially distributed target, a list of 100 companies for each province (160 companies for Nakhon Ratchasima) shown in Table 4.2-1 are prepared from the factory registration data made by the Provincial Industrial Office (PIO) by consultation with the Thai local counterpart and representatives from the Office of Industrial Economics (OIE). In selecting companies, about one half of them shall be selected from the priority industries. The other half shall be selected from industries which are regarded promising in the province by consulting existing industry reports and MOI's list of promoted industries.

There are also two types of questionnaires addressed to companies because of a difference in purpose. "Questionnaire for foreign capital companies and large Thai companies which are contemplating to enter local areas" and "questionnaire for SMEs in those local areas".

Questionnaire A is for company's capital investment less than 50 million Baht. Questionnaire B is for company's capital investment more than 50 million Baht or foreign companies.

Table 4.2-1. TARGET QUESTIONNAIRE DISTRIBUTES TO COMPANIES

Province	Number of companies surveyed Questionnaire
Nakhon Ratchasima	160
Buri Ram	100
Bangkok	100
Surin	100
Chaiyaphum	100
Total	560

Table 4.2-2. ACTUAL QUESTIONNAIRE DISTRIBUTE TO COMPANIES

Province	Number of companies surveyed by questionnaire A	Number of companies surveyed by questionnaire B	Total
Nakhon Ratchasima	153	23	176
Buri Ram	118	0	118
Bangkok	112	32	144
Surin	88	4	92
Chaiyaphum	122	7	129
Total	593	66	659

Actual, total questionnaires distributed to companies is 656 companies (Table 4.2-2). Although, target questionnaires distributed to companies should be 560 companies (Table 4.2-1). We expected more questionnaires received in order to get more sample size and analyzed, collective data to get precise answer. A total of 40 questionnaires of 656 (Table 4.2-3) are replied within a month.

Table 4.2-3. QUESTIONNAIRE RECEIVED FROM COMPANIES

Province	Number of companies surveyed by questionnaire A	Number of companies surveyed by questionnaire B	Total
Nakhon Ratchasima	15	1	16
Buri Ram	11	0	11
Bangkok	3	1	4
Surin	3	0	3
Chaiyaphum	6	0	6
Total	38	2	40

4.2.2 Result of Questionnaires Survey

(1) Company Total Fixed Asset

According to collected questionnaires data shown in Table 4.2-4, over 61.76 percents of companies have the total fixed asset less than 50 million baht which is classified as small and medium size enterprises. This data indicated competency of the study to develop specific project data and promote small and medium enterprises in the rural areas.

Table 4.2-4. TOTAL FIXED ASSET

Total Fixed Assets	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. less than 50 million baht	6	37.50	5	83.33	2	50.00	2	100	6	100	21	61.76
b. 50-100 million baht	4	25.00	0	0.00	1	25.00	0	0.00	0	0.00	5	14.71
c. 100-300 million baht	3	18.75	1	16.67	1	25.00	0	0.00	0	0.00	5	14.71
d. 300-500 million baht	3	18.75	0	0.00	0	0.00	0	0.00	0	0.00	3	8.82
e. over than 500 million baht	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	16	100.00	6	100.00	4	100.00	2	100.00	6	100.00	34	100.00

Note: Some companies did not answer this question.

(2) Type of Industry

Break down of questionnaires received by province and type of industry is as follows.

	Nakhon Ratchasima	Buri Ram	Bangkok	Surin	Chaiyaphum	Total
Food	4	3	-	1	1	9
Textile	-	1	-	-	1	2
Plastic and chemical	4	-	-	-	-	4
Construction material	1	-	-	-	-	1
Metal	2	-	1	-	-	2
Other	5	7	3	2	4	20
Total	16	11	4	3	6	40

(3) Marketing & Sale

1) Sale Revenue in 1999

As shown in Table 4.2-5 approximately 53.84% of the industrial firms have sale revenue more than 10 million Baht. Sale Revenue of small business is relate to fix asset meaning that if fix asset is 2 million Baht sale revenue is 2 million, either the company making a small profit or break even. If companies have a fix asset of 2 million Baht and sale revenue is 3 or 4 million, the company usually making small profit or big profit. Companies that make

small profit and big profit may need help to purchase efficient machinery and equipment, develop labor skill in order to proceed and become medium or large enterprises.

Table 4.2-5. SALE REVENUE IN 1999

Amount of Sales in 1999	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. less than 0.5 million baht	1	6.25	1	10.00	1	25.00	1	33.33	1	16.67	5	12.82
b. 0.5 to 1 million baht	3	18.75	1	10.00	0	0.00	0	0.00	0	0.00	4	10.26
c. 1 to 2 million baht	0	0.00	2	20.00	0	0.00	1	33.33	2	33.33	5	12.82
d. 2 to 5 million baht	1	6.25	0	0.00	0	0.00	0	0.00	1	16.67	2	5.13
e. 5 to 10 million baht	1	6.25	0	0.00	0	0.00	0	0.00	1	16.67	2	5.13
f. more than 10 million baht	10	62.50	6	60.00	3	75.00	1	33.33	1	16.67	21	53.84
Total	16	100.00	10	100.00	4	100.00	3	100.00	6	100.00	39	100.00

2) Performances Trend

By having performance trend data from 1996 to 1999 (Table 4.2-6). In 1996, companies average annual profit of 39.29% had small profit and 25% had a big profit. However, in 1997, companies average annual profit can be group as small profit and small loss. In 1998, the companies slightly gain more profit and break-even. Moreover, in 1999, the most of the result in small companies that result in even gain more profit than 1998.

In conclusion, in 1996 most of companies were in good condition and in 1997, 1998 the number of losses had increase and slow down in 1998 and slightly gain profit in 1999. This indication tell that the economic is slowly picking up, after 1999 profit trend expectedly to grow more. This indication will allow us to help companies plan how to develop their business while economic is starting to recover.

Table 4.2-6. PERFORMANCES TREND

Companies performance	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
In 1996												
a. Big profit	2	25.00	3	33.34	0	0.00	1	33.33	1	25.00	7	25.00
b. Small profit	5	62.50	2	22.22	2	50.00	0	0.00	2	50.00	11	39.29
c. Almost even	0	0.00	1	11.11	2	50.00	1	33.33	1	25.00	5	17.86
d. Small loss	1	12.50	2	22.22	0	0.00	0	0.00	0	0.00	3	10.71
e. Big loss	0	0.00	1	11.11	0	0.00	1	33.33	0	0.00	2	7.14
Total	8	100	9	100	4	100	3	100	4	100	28	100
In 1997												
a. Big profit	0	0.00	2	18.18	0	0.00	0	0.00	0	0.00	2	6.45
b. Small profit	3	33.33	4	36.36	2	50.00	2	66.67	3	75.00	14	45.17
c. Almost even	1	11.11	2	18.18	0	0.00	1	33.33	0	0.00	4	12.90
d. Small loss	2	22.22	0	0.00	1	25.00	0	0.00	1	25.00	4	12.90
e. Big loss	3	33.33	3	27.27	1	25.00	0	0.00	0	0.00	7	22.58
Total	9	100	11	100	4	100	3	100	4	100	31	100
In 1998												
a. Big profit	0	0.00	0	0.00	1	25.00	0	0.00	1	25.00	2	5.88
b. Small profit	6	50.00	4	36.36	1	25.00	0	0.00	3	75.00	14	41.18
c. Almost even	2	16.67	4	36.36	0	0.00	2	66.67	0	0.00	8	23.53
d. Small loss	0	0.00	3	27.28	2	50.00	1	33.33	0	0.00	6	17.65
e. Big loss	4	33.33	0	0.00	0	0.00	0	0.00	0	0.00	4	11.76
Total	12	100	11	100	4	100	3	100	4	100	34	100
In 1999												
a. Big profit	2	18.18	0	0.00	1	25.00	0	0.00	0	0.00	3	9.09
b. Small profit	3	27.27	7	63.64	1	25.00	1	33.33	3	75.00	15	45.46
c. Almost even	4	36.37	4	36.36	2	50.00	1	33.33	0	0.00	11	33.33
d. Small loss	1	9.09	0	0.00	0	0.00	0	0.00	1	25.00	2	6.06
e. Big loss	1	9.09	0	0.00	0	0.00	1	33.33	0	0.00	2	6.06
Total	11	100	11	100	4	100	3	100	4	100	33	100

3) Market Break down & Market competitive

According to questionnaire survey around 74.29% of companies, merchandise sold within the country and 60% sold in the provincial area (Table 4.2-7). For less than 20% of the merchandise will be sold direct and indirect export. Pricing is the major factors that affect the market competitiveness, therefore, they have to compete with each other, company who has low production cost will get the benefit from the market. Although, many companies willing to reduce their cost of production but they have no access to pursue those objective. In comparison, some export goods are cheaper than produce within the country. Similarly, quality is another major issue, they can not improve their quality of product in order to compete in the market (Table 4.2-8). The Table 4.2-8 also show related issues that companies have been faced in the market competitiveness issues.

Table 4.2-7. MARKET BREAKDOWN

Market breakdown	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Domestic												
1-35%	5	33.33	0	0.00	2	50.00	0	0.00	0	0.00	7	20.00
35-70%	1	6.67	0	0.00	0	0.00	0	0.00	1	16.67	2	5.71
70-100%	9	60.00	6	100	2	50.00	4	100	5	83.33	26	74.29
Total	15	100	6	100	4	100	4	100	6	100	35	100
- In the Provincial area												
1-35%	6	66.67	1	20.00	0	0.00	0	0.00	2	33.33	9	36.00
35-70%	0	0.00	0	0.00	0	0.00	1	33.33	0	0.00	1	4.00
70-100%	3	33.33	4	80.00	2	100	2	66.67	4	66.67	15	60.00
Total	9	100	5	100	2	100	3	100	6	100	25	100
b. Indirect export												
1-35%	4	80.00	1	50.00	0	0.00	0	0.00	0	0.00	5	71.43
35-70%	1	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1	14.29
70-100%	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	14.29
Total	5	100	2	100	0	0.00	0	0.00	0	0.00	7	100
c. export												
1-35%	1	14.28	1	100	1	50.00	0	0.00	0	0.00	3	30.00
35-70%	3	42.86	0	0.00	0	0.00	0	0.00	0	0.00	3	30.00
70-100%	3	42.86	0	0.00	1	50.00	0	0.00	0	0.00	4	40.00
Total	7	100.00	1	100.00	2	100.00	0	0.00	0	0.00	10	100.00

Table 4.2-8. MARKET COMPETITIVE

Major factors that affect the market competitiveness of your products	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. price	12	27.91	9	24.32	2	22.22	3	33.33	5	27.78	31	26.72
b. quality	9	20.93	7	18.92	1	11.11	1	11.11	4	22.22	22	18.96
c. development of new products	4	9.30	3	8.11	2	22.22	0	0.00	3	16.67	12	10.35
d. delivery on time	4	9.30	4	10.81	1	11.11	1	11.11	2	11.11	12	10.35
e. market information	4	9.30	3	8.11	2	22.22	2	22.22	1	5.56	12	10.35
f. retailing network	0	0.00	2	5.41	0	0.00	2	22.22	1	5.56	5	4.31
g. export financing	0	0.00	1	2.70	0	0.00	0	0.00	0	0.00	1	0.86
h. design	1	2.33	1	2.70	0	0.00	0	0.00	0	0.00	2	1.72
i. machinery and equipment	6	13.95	4	10.81	1	11.11	0	0.00	1	5.56	12	10.35
j. skill of workers	3	6.98	3	8.11	0	0.00	0	0.00	1	5.56	7	6.03
Total	43	100.00	37	100.00	9	100.00	9	100.00	18	100.00	116	100.00

(4) Production and Operation

1) Capacity utilization

As shown in Table 4.2-9 an average of utilized production capacity is accounting for about 61%, 55% and 60% in the year 1997, 1998 and 1999 respectively. Many companies look forward to expand their production capacity. Most of them would like to process their plan with in a year. Also they are some constrain that delay their investment whether lack of finance, information support, human resource, and also market uncertainly.

Table 4.2-9. CAPACITY UTILIZATION

Year	Nakhon Ratchasima	Buri Ram	Bangkok	Surin	Chaiyaphum	Average
1997	50.90	51.28	61.25	66.67	75.00	61.02
1998	43.51	39.41	61.25	61.67	70.00	55.17
1999	48.01	36.19	71.25	66.67	78.00	60.02
Average	47.47	42.29	64.58	65.00	74.33	58.74

2) Operation problems

There are several problems considered by the entrepreneurs in their operation. It's seems that most of the problems are relate to each other. Table 4.2-10 shows that the most important problems that cause operation in the company is unstable purchasing order to customer. The second is difficulty in market development and the third is difficulties in borrowing of loans or financing. These three problems represent 49% of the answer.

Table 4.2-10. OPERATION PROBLEM

Major problems in operation	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Difficulties in borrowing of loans or financing	6	13.95	3	9.38	1	11.11	3	30.00	3	17.65	16	14.41
b. Low technical capability and/or job-hopping of employees	7	16.28	5	15.63	0	0.00	0	0.00	2	11.76	14	12.61
c. Increase in salaries and wages of employees	3	6.98	2	6.25	2	22.22	0	0.00	2	11.76	9	8.11
d. High import duties of raw materials, intermediates or parts	3	6.98	2	6.25	0	0.00	0	0.00	2	11.76	7	6.31
e. Obsolescence of production technology and/or facilities	5	11.63	3	9.38	1	11.11	0	0.00	1	5.88	10	9.01
f. Unstable purchasing order to customers	7	16.28	6	18.75	2	22.22	3	30.00	2	11.76	20	18.02
g. Severe requirements of customers for quality, price and/or delivery of products	5	11.63	2	6.25	1	11.11	0	0.00	0	0.00	8	7.21
h. Difficulty in market development	6	13.95	4	12.50	2	22.22	3	30.00	4	23.53	19	17.12
i. Lack of reliable business partner	0	0.00	3	9.38	0	0.00	1	10.00	1	5.88	5	4.50
j. Others	1	2.32	2	6.25	0	0.00	0	0.00	0	0.00	3	2.70
Total	43	100.00	32	100.00	9	100.00	10	100.00	17	100.00	111	100.00

(5) Loans and credit

1) Loan and credit needed

Approximately 62% of the firms are still need the loan and credit facilities for their business. The percentage of companies needed the loan is 100% in Surin and 80%, 72.73%, 50% and 42.86% in Chaiyaphum, Buri Ram, Bangkok and Nakhon Ratchasima respectively. Majority of the firms need loan for their

working capital and purchase of machinery and equipment. Details are shown in Table 4.2-11. However, many companies have faced the difficulties in borrowing money from banks and corporation.

Table 4.2-11. LOAN AND CREDIT NEEDED

Loans or credit needed	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1. Yes	6	42.86	8	72.73	2	50.00	3	100	4	80.00	23	62.16
2. No	8	57.14	3	27.27	2	50.00	0	0.00	1	20.00	14	37.84
Total	14	100	11	100	4	100	3	100	5	100	37	100
Purpose of loan												
a. Working capital	4	23.52	6	35.29	1	33.33	3	37.50	4	33.33	18	31.58
b. Purchase of machinery and equipment	5	29.41	6	35.29	1	33.33	2	25.00	4	33.33	18	31.58
c. Purchase of inspection/measuring equipment	1	5.88	0	0.00	0	0.00	0	0.00	1	8.33	2	3.51
d. Land acquisition	0	0.00	1	5.88	0	0.00	0	0.00	0	0.00	1	1.75
e. Factory building construction	2	11.77	1	5.88	0	0.00	1	12.50	2	16.67	6	10.53
f. Expenditure for R&D	2	11.77	0	0.00	0	0.00	0	0.00	0	0.00	2	3.51
g. Relocation of the factory site	1	5.88	0	0.00	1	33.33	0	0.00	0	0.00	2	3.51
h. Purchase of waste treatment facilities	2	11.77	2	11.77	0	0.00	0	0.00	1	8.33	5	8.77
i. Other (Specify)	0	0.00	1	5.88	0	0.00	2	25.00	0	0.00	3	5.26
Total	17	100.00	17	100.00	3	100.00	8	100.00	12	100.00	57	100.00

2) Difficulties in borrowing money from bank or corporation

Difficulty in borrowing money from bank and corporation, firstly (34.88%), banks do not finance the full amount of loan requirement. Secondly (18.61%), complicated procedure, the requirements for documentation and longtime requirement for evaluation of loan application. Also the bank's passive attitude to finance small and medium scale enterprises is the third reason (16.28%) as shown in Table 4.2-12.

Table 4.2-12. DIFFICULTIES IN BORROWING

Difficulties or problems in Borrowing from banks or Corporations	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Insufficient mortgage or collateral to meet you loan requirement	3	33.33	1	7.14	1	33.00	1	14.29	3	30.00	9	20.93
b. The complicated procedure, the requirements for documentation and long time requirement for evaluation of loan application.	2	22.22	2	14.29	1	33.33	2	28.57	1	10.00	8	18.61
c. Lack of official credit guarantee system to compliment to insufficient mortgage	0	0.00	1	7.14	0	0.00	0	0.00	0	0.00	1	2.33
d. Bank's passive attitude to finance small-and medium-scale enterprises.	1	11.11	2	14.29	1	33.33	1	14.29	2	20.00	7	16.28
e. Banks don't finance the full amount of loan requirement, for example 80% of total requirements is a limit of the loan	3	33.33	5	35.71	0	0.00	3	42.86	4	40.00	15	34.88
f. Others (Specify)	0	0.00	3	21.43	0	0.00	0	0.00	0	0.00	3	6.98
Total	9	100.00	14	100.00	3	100.00	7	100.00	10	100.00	43	100.00

(6) Business Information

1) Major sources of business information

According to Table 4.2-13 shown that companies when they need information sources they mainly rely to the industrial association, trading company, special manufacturing club. These three private organizations represent 56% of the answer. In addition, a key information support that companies expect from government institution is guidance on quality control and training of employees. Details are shown in Table 4.2-14. However, most of the companies also face problems from using government services (Table 4.2-15) due mainly to complicated and time consuming procedure 51.14%, and 29.73% lack of information about existence of programs and facilities. All these data showing that existing government services to the public but they not reliable in information support or service orient.

Table 4.2-13. SOURCE OF BUSINESS INFORMATION

Major sources of business information	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Chamber of Commerce	4	12.12	2	7.41	1	11.11	0	0.00	3	16.67	10	11.36
b. Manufacturing club	3	9.09	3	11.11	1	11.11	1	11.11	2	11.11	10	11.36
c. Industry associations	5	15.15	7	25.93	3	33.33	1	11.11	3	16.67	19	21.59
d. Commercial banks	3	9.09	3	11.11	1	11.11	1	11.11	1	5.56	9	10.23
e. Trading companies	8	24.24	4	14.82	0	0.00	2	22.22	6	33.33	20	22.73
f. Consultants	2	6.06	1	3.70	0	0.00	2	22.22	1	5.56	6	6.82
g. Local government	3	9.09	5	18.52	1	11.11	0	0.00	1	5.56	10	11.36
h. Other companies	3	9.09	2	7.41	2	22.22	0	0.00	1	5.56	8	9.09
i. Others	2	6.06	0	0.00	0	0.00	2	22.22	0	0.00	4	4.55
Total	33	100.00	27	100.00	9	100.00	9	100.00	18	100.00	88	100.00

Table 4.2-14. EXPECTED FROM GOVERNMENT

Kinds of support are you using and/or expect from government institution	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Total	
a. Corporate management advice	2	12.50	0	0.00	0	0	0	0	0	0	2	9.09
b. Financial management / accounting system consulting	1	6.25	0	0.00	0	0	0	0	0	0	4	18.18
c. Technological guidance	1	6.25	0	0.00	0	0	0	0	0	0	1	4.55
d. Guidance on quality control	2	12.50	1	50.00	0	0	1	100	0	0	4	18.18
e. Training of employees	4	25.00	1	50.00	0	0	0	0	0	0	5	22.73
f. Information services (Technology and marketing)	2	12.50	0	0.00	0	0	0	0	0	0	2	9.09
g. Inquiry services (Potential partners and buyers)	2	12.50	0	0.00	0	0	0	0	0	0	2	9.09
h. inquiry services (material suppliers)	2	12.50	0	0.00 0.00	0	0	0	0	0	0	2	9.09
Total	16	100.00	2	100.00	0	0	1	100.00	0	0	22	100.00

Table 4.2-15. PROBLEM IN USING GOVERNMENT SERVICES

What kinds of problems have you faced in using government institutions, programs and facilities in General?	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Lack of information about existence of programs and facilities	5	35.71	2	20.00	1	16.67	2	40.00	1	50.00	11	29.73
b. Difficulty in access to them	2	14.29	2	20.00	1	16.67	0	0.00	0	0.00	5	13.52
c. Complicated and time consuming procedure to use them	7	50.00	5	50.00	4	66.67	2	40.00	1	50.00	19	51.14
d. Others	0	0.00	1	10.00	0	0.00	1	20.00	0	0.00	2	5.41
Total	14	100.00	10	100.00	6	100.00	5	100.00	2	100.00	37	100.00

(7) Labour

1) Education level

According to questionnaire survey (Table 4.2-16) out of 3,038 employees, 48.29% of them finished primary school, 20.90% finish lower secondary school and 13.76% finish upper secondary school, meaning that in our industrial labour over 80% had educated only in secondary school and lower. Moreover, vocational school and higher which should show higher rate in the work place. Especially vocational should play an important role in the work place.

Table 4.2-16. EDUCATION LEVEL OF EMPLOYEES

Education level employees	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Primary school	526	41.22	210	34.77	664	67.27	22	24.72	53	64.63	1,467	48.29
b. Lower secondary school	235	18.42	174	28.81	176	17.83	34	38.20	16	19.51	635	20.90
c. Upper secondary school	191	14.97	140	23.18	53	5.37	22	24.72	12	14.63	418	13.76
d. Vocational school and higher	324	25.39	80	13.24	94	9.52	11	12.36	1	1.22	510	16.79
Total	1,276	100.00	604	100.00	987	100.00	89	100.00	82	100.00	3,038	100.00

2) Employment of new staff & training programs

As shown in Table 4.2-17, when companies require new skilled employees almost 60% will train existing employees to acquire new skills and around 16% by advertise in public or contact local employment bureau. Moreover, 56% of the companies using internal on the job training program, 18% using internal off the job training programs. Some companies using public training institution, business associations, private training service provider which all of them rate less than 10%. Details are shown in Table 4.2-18.

Table 4.2-17. EMPLOYMENT OF NEW STAFF

Employment of new staff When you need skilled staff in a newly created division, how do you obtain such staff?	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Obtain internally by training existing staff to acquire new skills	8	44.44	6	60.00	2	66.67	3	60.00	5	83.33	24	57.14
b. Advertise in public	5	27.77	2	20.00	0	0.00	0	0.00	0	0.00	7	16.66
c. Contact local employment bureau	4	22.22	2	20.00	1	33.33	0	0.00	0	0.00	7	16.66
d. Bring the staff from the other companies by offering better conditions	1	5.55	0	0.00	0	0.00	1	20.00	0	0.00	2	4.76
e. Others	0	0.00	0	0.00	0	0.00	1	20.00	1	16.67	2	4.76
Total	18	100.00	10	100.00	3	100.00	5	100.00	6	100.00	42	100.00

Table 4.2-18. TRAINING PROGRAMS FOR WORKERS

Training programs for workers Who provides Training Programs to your workers?	Nakhon Ratchasima		Buri Ram		Bangkok		Surin		Chaiyaphum		Overall	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Public training institution, including schools	0	0.00	2	20.00	0	0.00	0	0.00	0	0.00	2	4.88
b. Business associations	2	10.52	0	0.00	0	0.00	0	0.00	0	0.00	2	4.88
c. Private training service providersa	1	5.27	1	10.00	1	33.33	0	0.00	0	0.00	3	7.31
d. Internal off the job training programs	3	15.79	3	30.00	0	0.00	1	33.33	0	0.00	7	17.07
e. Internal on the job training programs	10	52.63	3	30.00	2	66.67	2	66.67	6	100	23	56.10
f. Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
g. No training programs	3	15.79	1	10.00	0	0.00	0	0.00	0	0.00	4	9.75
Total	19	100.00	10	100.00	3	100.00	3	100.00	6	100.00	41	100.00

4.3 Current situation and prospects of main industries

4.3.1 Agro-processing and Food industry

4.3.1.1 Current situation of agro-processing and food industry

(1) Current situation of agro-processing and food industry in Project area

Characteristics of agriculture at Northeastern area of Thailand, where includes 4 Changwats is that only 10% of agriculture land are irrigated and almost agriculture land is rain-fed one. It naturally leads to the limited number of agricultural produce, which can be harvested. Thai government has been promoting agriculture corresponding to such climate conditions for a long time. Among of those agriculture produce, rice, cassava, and sugarcane are representative crops in this area. After harvested, those are carried into processing-factories as follows: rice milling factories, tapioca pellet or starch factories, and sugar factories. Those products have been strong foreign currency earners, and still have competitive power at international market. However, with regard to tapioca export, the amount of export will be expected to decrease because of import quota of EU, where is a major export destination. As to sugar export, its oversupply at international market will be a pressure to get the price down. Regarding to rice export, as Vietnam is getting to cut figures as a strong competitor by taking advantage of its cheap labor cost, the position of Thailand will be invaded in the future.

Table 4.3-1. THE NUMBER OF AGRO-PROCESSING FACTORIES BY KINDS OF PRODUCTS AND BY CHANGWAT (1998)

	Nakhon Ratchasima	Buri Ram	Surin	Chaiyaphum
Meat-processing*1	36	2	1	-
Dairy	10	1	-	1
Marine product processing	6	1	2	5
Edible oil	-	1	-	-
Vegetable and Fruits processing*2	7	3	2	6
Rice milling*3	4973	1049	784	1249
Tapioca	336	30	5	67
Flour *4	75	9	62	35
Sugar*5	18	1	4	2
Refreshments and snack foods	16	2	9	14
Spice and seasoning	3	1	1	2
Ice	37	8	19	8
Alcohol drink	-	1	1	1
Drinking water*6	8	-	3	6
Animal feed	24	1	2	2

Cf. Data based on those from PIO office was newly modified by field survey and doesn't include factories with less than 20 employee based on DIW definition.

*1 Slaughter house includes
*2 Soya sauce factory includes
*3 Number of rice mill is from 1995 data
*4 Bakery and rice noodle factories includes
*5 Ice cream and Palm sugar includes
*6 Mineral water includes

In Fruits and vegetables cultivation, mango and guava which don't need water to plant and chili are popular in project area, agro-processing factories, that makes use of such produce as raw materials are located here. As Pak Chong area in Nakhon Ratchasima is first place to start livestock industry in Thailand, dairy industry, which uses products from livestock industries are well developed there and feed mill factories are also located, either.

Besides that, as Changwat Nakhon Ratchasima has a big population of 2.6 million, bakery and snack food factories are also located to satisfy the huge demand of products at center of the city.

Those agro-processing factories have following characteristics corresponding to the location, product destination, processing, and resource intensification. (Table 4.3-2. Table 4.3-3.)

Table 4.3-2. CHARACTERISTICS OF AGRO-PROCESSING BY LOCATION AND PRODUCT DESTINATION IN PROJECT AREA

	Plant or factory location				Product destination		
	Resource oriented	Consumer Oriented	Related industry oriented	Access convenience oriented*	Domestic		Export
					Local only*	Local and big cities	
Meat Processing	O	O				O	
Slaughter		O			O		
Milk	O					O	
Dairy	O	Δ	O		O		
Marine product processing		O			O		
Edible oil			O			O	
Dried and canned fruit	O	Δ				O	O
Vegetable and fruits processing (Juice etc.)	Δ	O				O	
Vegetable processing (Chili sauce etc.)		O		O		O	Δ
Tapioca chip	O						O
Tapioca flour			O	Δ			O
Rice flour				O		O	O
Rice noodle		O			Δ	O	Δ
Bakery		O			O		
Sugar	O						O
Ice cream	O				O		
Rice cracker、snack foods		O			O	Δ	Δ
Glucose		O				O	
Chemical additives		O			O		
Alcohol			O			O	
Drinking water		O			O		

(Note) * Access convenience oriented means that factory locates the place between resource and consumption place.
Δ means that it has light tendency for that.
* Local only means that its products are mainly sold at inside Changwat.

(2) Current situation of each agro-processing and food industry

Meat processing industry and Dairy industry: In case meat is processed just as it is, it is slaughtered near consumption place. And in case it is processed like sausage, there is some tendency that meat-processing factories are located at closer to the place, where raw material is available.

Among the project area, dairy industry at Pak Chong, chicken feeding and poultry industry at its neighboring Changwat Saraburi, pig farm and the processing industry at Changwat Buri Ram are popular. For that, vertical industry linkage is formulated that maize and sorghum are also planted around there to satisfy its demand of animal feed, and feed mill factories are adjacent to the areas. The industry doesn't import animal feed, but mainly procures them such as maize, broken rice, and peeled skin of cassava inside project area.

Meat-processing industry produces various kinds of products: sausage, snack food made from pig, yakitori, frozen chicken etc. As factories are required to invest large amount of money if it is commercially managed, many of them are done by Chinese-Thai owners or food conglomerate.

Table 4.3-3. CHARACTERISTICS OF AGRO-PROCESSING BY LEVEL OF PROCESSING AND RESOURCE INTENSIFICATION

	Level of Processing			Resource intensification		
	Agro-processing		Food industry	Capital intensive	Labor intensive	Intermediate
	First processing	Final processing				
Meat Processing		O				O
Slaughter		O			O	
Milk		O		O		Δ
Dairy		O				O
Marine product processing		O			O	
Edible oil		O		O		
Dried and canned fruit		O		O	Δ	
Vegetable and fruits processing (Juice etc.)		O		O		
Vegetable processing (Chili sauce etc.)		O				O
Tapioca chip	O			O		
Tapioca flour	O			O		
Rice flour	O			O		
Rice noodle		O				Δ
Bakery		O			O	
Sugar		O		O		
Ice cream		O				O
Rice cracker, snack foods		O			O	
Glucose			O	O		
Chemical additives			O			Δ
Alcohol		O		O		
Drinking water			O	O	Δ	

Cf. First process means that it produces intermediates from agricultural produce. Final process means that it produce final products from intermediates or agricultural produce.

Aquatic product processing: Although river and pond fish are processed by salt-pickling or fermentation, many such factories are categorized into small size. This is because fishpond cultivation is popular at northeastern Thailand, many fish are sold to local market without processing.

Edible oil processing: This oil factory is located at Amphoe Krasang in Buri Ram and manufactures rice bran oil. This product is used for feeding animal or edible use.

Vegetable and fruits processing: This industry manufactures many kinds of processed products such as dried, syrupped, jamming etc. Because kinds of raw materials used are also diverse.
Many of factories located at Chaiyapum are chili processing. And also chili culture can be observed everywhere in Thailand as even it planted at home gardens. Chili is commercially planted at Amphoe Shikiu and Don Khun Thot at Nakohn Rachasima, processing factories, which use them as raw materials are located there to produce various kinds of spice and seasoning.
As Amphoe Krasang in Buri Ram to Surin is famous for chinese radish cultivation, small factories located there process radish by powdering or seasoning in rice bran paste, sell to domestic market, and export under OEM.
Mango and Jackfruits are commercially planted at Amphoe Pak Chong and Pak Thong Chai in Nakhon Ratchasima, fruit processing factories are manufacturing syrupped and dried products.

Tapioca: As cassava is planted at many areas in project area, tapioca factories are scattered in the area because the balky raw materials need to process within 48 hours after harvest. Tapioca can also be used at many other industries corresponding to the processing level. As many tapioca pellet is exported as animal feed to EU, tapioca flour is possible to use for manufacturing glucose, glutamic acid sodium, and printing glue through further processing It is also used for bakery flour. In the present, such food industry with high-technology are mainly located near Bangkok, inviting those companies into project area would be a main subject in the future.

Rice flour and rice noodle: Former one is located near places where raw materials are available and the latter at consumption place. Both types sell their products not only at domestic market but also export.
Rice and the related factories, that is, raw material supply and users such as rice flour factory using broke glutinous rice, snack food factory using glutinous rice, and rice noodle factory are forming vertical industry linkage.

Sugar: Sugar industry is a typical capital intensive one, which factories locate at the center of sugarcane fields. Sugar manufacturing will continue for a while as long as it is possible to export them. Byproduct, the bagasse is used for raw material of pulp and fuel. A factory in Chaiyaphum is

manufacturing particleboard from bagasse. Mud, another byproduct is also used for fertilizer. Advanced use of such byproducts will be a subject in the future. Adding more value through improving sugar refining technology will be also necessary in considering Thailand's survival as a sugar export country in the future.

Ice cream and Bakery: Both type of factories are located at Amphoe Muang, where many consumers are living. Many factories are small-scale, and scattered to satisfy each market segmentation.

Rice cracker and Snack food: These factories are also located near consumption places. Rice cracker factories are exporting their products to some countries that Chinese people live. It was observed that they have potential to increase their amount of export by improving product quality, package design etc.

Glucose and Chemical additives: Many such companies categorized into secondary processing factories are likely to locate around Bangkok areas because its processing requires higher technology and information. To promote food industry with higher processing technology in project area, it is expected for existing factories to prepare attractive incentive plan.

Alcohol, Drinking water, Ice: Rice liquor factory is located at Amphoe Satuk in Buri Ram. Drinking water manufactures and icemakers are located at the center of Amphoe Muang. As demand for those products will be proportioned to the size of population, its market is saturated. We will not be able to expect high growth of this industry very much.

4.3.1.2 Prospects of agro-processing and food industry

(1) Prospects of agro-processing and food industry

Project area has some disadvantage that limited numbers of raw materials, agricultural produce can be harvested because only 10% of agriculture land are irrigated and almost land is rain-fed one. However, there are still a lot of rooms to develop agro-processing industry through further improvement of processing technology and technology transfer etc.

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

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

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

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

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

Besides that, broken rice, rice bran, peeled skin of cassava, rice bran oil, waste of fruits and vegetable are used as animal feed.
Bakery uses tapioca flour. Ice cream making use powder milk, sugar etc.
Bagasse from sugar refining is used as materials of pulp and particleboard. Mud is used for fertilizer.

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

some concrete support are implemented to solve such problems, those SMEs will further to grow and contribute regional industrial development.

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

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

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

(2) Prospects of existing each agro-processing and food industry

Meat processing industry・Dairy industry: Although many meat processing and dairy factories target to sell their products at domestic markets only, it will be possible to promote and strengthen their sales by adding more value to products through applying higher processing technology.
As many dairy and processing industry already integrate in Pak Chong and neighboring areas at Nakhon Ratchasima, further promotion policy for those industry will be necessary. Also price difference between that of powder milk and that of raw milk is quite high, some policy to protect and bring up domestic dairy industry will be necessary.

Edible oil processing (rice): This is rice related industry. Research and Development for rice byproduct use by government support will lead the development of this industry.

Vegetable and fruits processing: As many factories which are engaging in this processing are categorized into small size, they have a lot of rooms to

develop in product development, technology, and marketing. Also as they have likely tendency to locate places where raw materials are available, they are important industry to promote regional industrial development.
Foreign agro-processing companies, which produce products only for export in Nakhon Ratchasima are realizing to produce high quality products through authoritative sanitary control and cheap labor use. As it is clear that these companies established factories in project area to receive benefits of BOI zone 3, it will be possible to expect establishments of same type of companies in the future.

Tapioca: There is a matter of concern that the export volume of tapioca pellet and flour will decrease. For that, development of new products by use of tapioca flour will be urgent issue.
Research and development for new products such as glucose, glutamic acid sodium, and printing glue will be led by government. Food industry using such high technology prefers to locate around Bangkok areas because it is easy to access latest technology and information. If such disadvantages which project area has are solved and attractive incentives are proposed, those existing factories might consider relocating their factory in the project area.

Rice noodle factory and rice cracker factory: Thais can not miss rice noodle and rice cracker even a day because rice is a part of Thai culture. As many factories are small scale and selling their products to neighboring markets, if they could improve quality and packaging of products, they could expand their sales and even export.

Sugar: Although sugar manufacturing will last as long as it can export, it is necessary to consider effective use of byproducts.
Byproduct, the bagasse is used for raw material of pulp and fuel. A factory in Chaiyaphum is manufacturing particleboard from bagasse. Mud, another byproduct is also used for fertilizer. However, as the effective use is still few, advanced use of byproducts will be a subject in the future. Adding more value through improving sugar refining technology will be also necessary in considering Thailand's survival as a sugar export country in the future.

As food demand for ice cream, bakery, and refreshments will be affected by the size of population, it will be difficult to expect rapid growth of this industry in near future.

(3) Development potentials of new agro-processing and food industry in project area

Mulberry tea: It is still a part of traditional culture to raise cocoon by mulberry tea, make clothes by silk in Thailand. However, recently, cheaper silk products from China and Laos are available at international market, this labor-intensive industry is getting to lose the competitiveness. But mulberry can also be used for producing tea, which has some effect to lower cholesterol in blood. Thanks to such reputation, the tea production is gradually increasing. It will be possible to export mulberry tea to developed countries, where is more health conscious through advertisements and marketing promotion activity.

Kenaf: Many kenaf were used to plant and used as raw materials of rice bags or pulp until cassava plantation became popular in northeastern Thailand.

It is clear that the shortage of wood chip will happen because more demand for paper require more raw materials of paper in the future. For that purpose, developed countries are again researching kenaf use as pulp and paper. It is proved by academics that kenaf has air purification effect because it absorbs CO2 five times as much as redwood can do, and also has water purification effect because it absorbs large amount of phosphorous and nitrogen in water at hydroponics. Therefore, it ahs been paid very much attention as environmental friendly plant.

As kenaf is an appropriate plant for northeastern Thailand because the cultivation doesn't require much water, it will be possibility to develop some industry by the use of it.

Medical use of tamarind seeds: Tamarind is planted everywhere in northeastern Thailand and a popular fruit for Thais. One fruit of tamarind includes three to five seeds, which can be used as chinese medicine. Now as those seeds are not effectively used, it is worth starting a pilot project for effective use of them in project area.

4.3.2 Electric and Electronics Industry

4.3.2.1 Impacts of the economic crisis and strategic shift

The electric and electronics industry in Thailand is made up of diverse forms of businesses which are roughly classified into three types, namely export enterprises, domestic market-oriented enterprises, and local enterprises. Up to the late 1980s, the industry was dominated by labor-intensive operations. In the 1990s, capital-intensive operations have been on the rise, led by foreign companies. Today, the industry is characterized by presence of foreign manufacturers, particularly Japanese companies, which account for major portions of production. Statistical data indicate that production by export enterprises overwhelms that of domestic market-oriented and local ones. Compared to the large volume of production, however, their local procurement of parts and is very small. Thus, export enterprises are primarily engaged in assembly operations by importing parts and exporting products, rather than manufacturers handling complex business processes from product development to procurement.

During the survey, the study team visited 10 electric/electronics manufacturers in Bangkok and 7 in Korat. 11 manufacturers were classified as export enterprises, 4 domestic market oriented, and 2 local enterprises. Note that no electric and electronics manufacturer operates in the study area, i.e., Buri Ram, Surin and Chaiyaphum.

(1) Sales trends

The economic crisis, which broke out in mid-1997, had different impacts according to the type of business. Figure 4.3-1 shows sales trends since 1996 of 17 companies visited by the study team. Domestic market-oriented and local enterprises were hit hard by the economic crisis, and production of household appliances (including TVs, refrigerators and washing machines) plummeted in 1997 to 50% of the peak levels between 1990 and 1993. Although sales figures showed some recovery in 1998 and 1999, they are still far below those during the booming period. In contrast, export enterprises have been expanding sales year after year, driven by the devaluation of the baht.

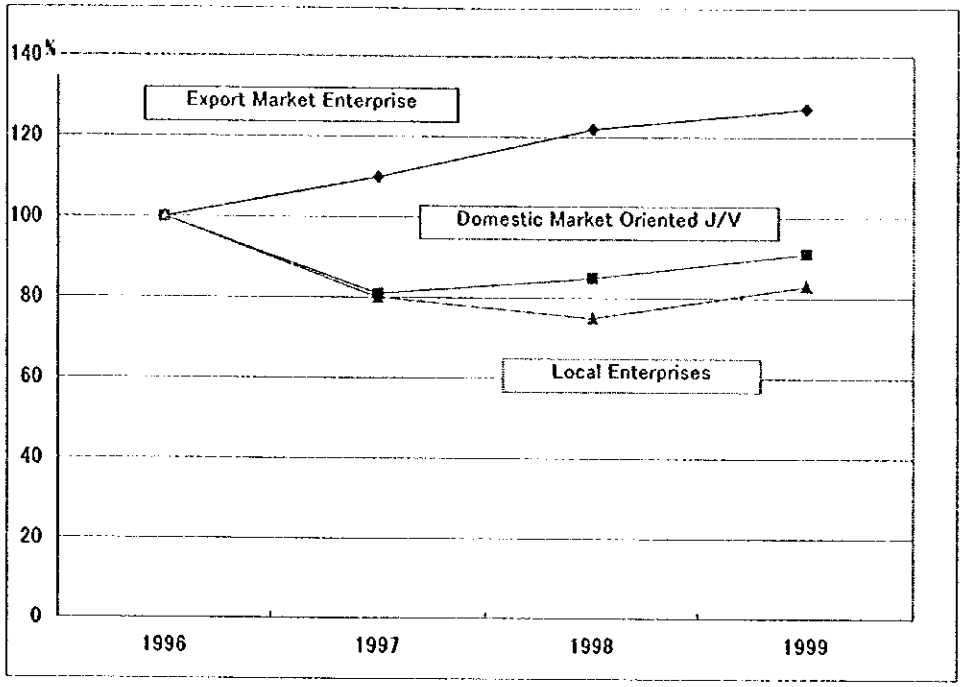


Figure 4.3-1. TRENDS OF SALES AMOUNT (1996-1999)
(as 100% production in 1996)

(2) Strategic shift after the economic crisis

The electric and electronics industry, after reaching its apex between 1990 and 1995, underwent a major change in business environment after the economic crisis in 1997 and the subsequent depreciation of the baht. In particular, domestic market-oriented enterprises suffered a sharp drop in sales, which affected heavily suppliers, and they are facing a turning point after the booming years. Most enterprises responded the crisis followed by economy policy to devalue the currency by increasing export production and expanding exports in an attempt to revitalize the industry. As no quick recovery cannot be expected for domestic market-oriented and local enterprises, they try to make up for dreary domestic sales by export expansion and thus are turning their strategic focus to export business. Figure 4.3-2 shows export trends by type of enterprise.

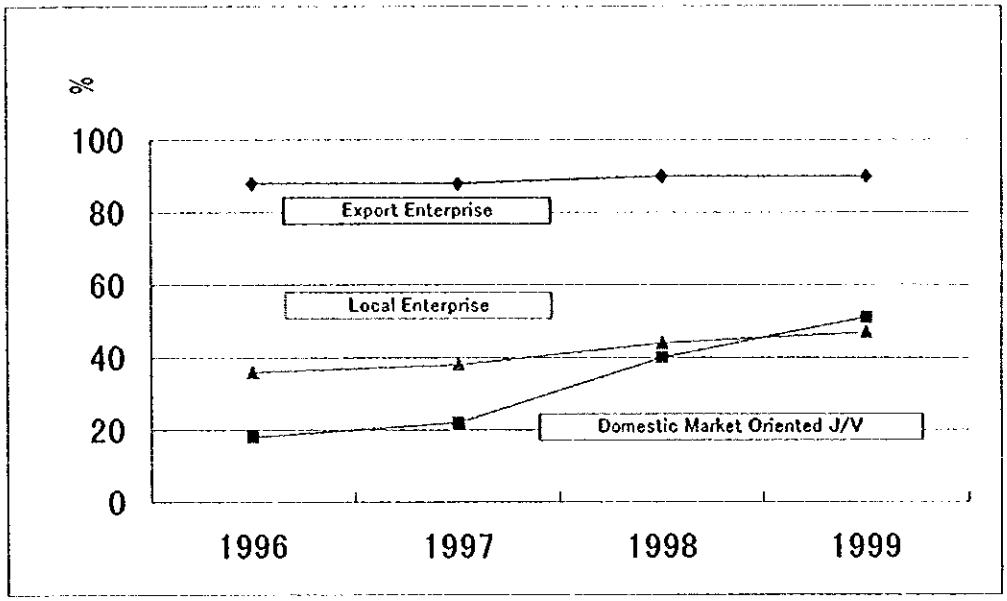


Figure 4.3-2. CHANGE IN EXPORT TO TOTAL SALES

Note that some of local enterprises have shifted their weight to export business and have achieved more than 20% sales growth under the currency devaluation. On the other hand, those still serving the domestic market lose sales proportionally to the downturn of the national economy. To break away from the negative linkage, they have to rely on export markets as a major source of growth.

Furthermore, the same trend is observed among Japanese-affiliated export-oriented and domestic market oriented companies. No significant difference is observed between foreign and local enterprises, except for the fact that foreign manufacturers are making up for the decline in domestic demand under the support of their parents who transfer export production to them.

4.3.2.2 Future outlook for the electric and electronics industry

(1) Export enterprises

The economic crisis and the devaluation of the currency have driven export enterprises to boost production and strengthen their position as the regional base of export production. Japanese companies increasingly shift their production capacities in Malaysia and Japan to Thailand, where production

volume grows appreciably. Nevertheless, Japanese-Thai joint ventures are primarily under direct control of parent companies in Japan, which make and implement marketing plans, set prices, furnish materials and parts, and certify quality of locally procured products. As a result, local companies make very limited purchase locally, such as packages and printing matters, and have few commercial relations with local suppliers. Many export enterprises feel that local suppliers are unable to meet requirements in the areas of quality, delivery schedule and price. To encourage export enterprises to generate a higher value added in the country, therefore, it is imperative to develop local suppliers, mainly small- and medium-sized enterprises, into highly skilled manufacturers of parts that can compete with imports.

(2) Domestic market-oriented enterprises

Foreign companies serving the domestic market haven been shifting their focus to exports in response to the currency devaluation. Many of them started to operate in Thailand since the 1970s to supply import substitutive products. Over three decades, they have been fostering a large number of local enterprises, with local content exceeding 70%. Up until the economic crisis in 1997, they grew with strong domestic demand, developed good relationships with local suppliers and introduced new technologies through technical assistance. As they move to the export market, they have to procure parts with higher quality from the current pool of suppliers and intend to develop a support system in that direction and a new relationship.

(3) Local enterprises

Very few local enterprises export their products. Small- and medium-sized enterprises delivery all products to domestic customers for the following reasons:

1) They can only manufacture parts for products sold in the domestic market, not for those that meet industrial standards adopted in importing countries, nor they have knowledge or know-how to obtain certification under such standards.

2) They mainly make parts according to drawings and specifications provided by the buyer, and they do not develop products nor modify the existing ones.
3) There is no brand unique to Thai industry, which fails to study products of competitors in the international market.
4) Most local enterprises are specialized in production and do not have marketing know-how and experience required to explore new markets, despite strong price competitiveness.

Nevertheless, around 30% of local enterprises are aggressively selling products to foreign companies operating in the country. They have been increasing sales at an annual rate of 20% and widen the gap with local enterprises that do not choose or are unable to choose the export-oriented strategy. They are mostly managed by owners who are capable of making quick decision and respond to inquires from many countries including South Korea, Singapore and Taiwan.

4.3.2.3 Current state and future outlook for the electric and electronic industry in Nakhon Ratchasima

(1) Current state

In Nakhon Ratchasima, leading electric and electronics makers such as JVC, Seagate and Orion are already operating and supporting industries to serve them are emerging. A major concentration is seen in the Suranarre industrial estate where 13 electric and electronics makers (mainly Japanese) are operating. Suppliers include Nippo (molding), Saian (mold), and APTS and Toyonaga (electronic parts). The move was initiated by assemblers, followed by suppliers who invested from Japan or Bangkok to establish the parts-supply system to enable local procurement. Suppliers are located near export manufacturers because frequent delivery (twice per day) is required for the manufacture of export products.

(2) Issues

At present, export enterprises that have high levels of technology required by the electric and electronics industry are operated in the province, and local suppliers are emerging, such as molding and pressing shops. Nevertheless,

their number is still small and further efforts should be made to bring a wide variety of suppliers into the provide to establish a broad supplier base. The province accommodates a large number of high-tech manufacturers and can grow into a high-tech production base that is comparable to the household appliance production base in and around Bangkok. Major issues facing the electric and electronics industry in the area are summarized as follows:

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

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

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

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

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

4.3.3 Ceramics

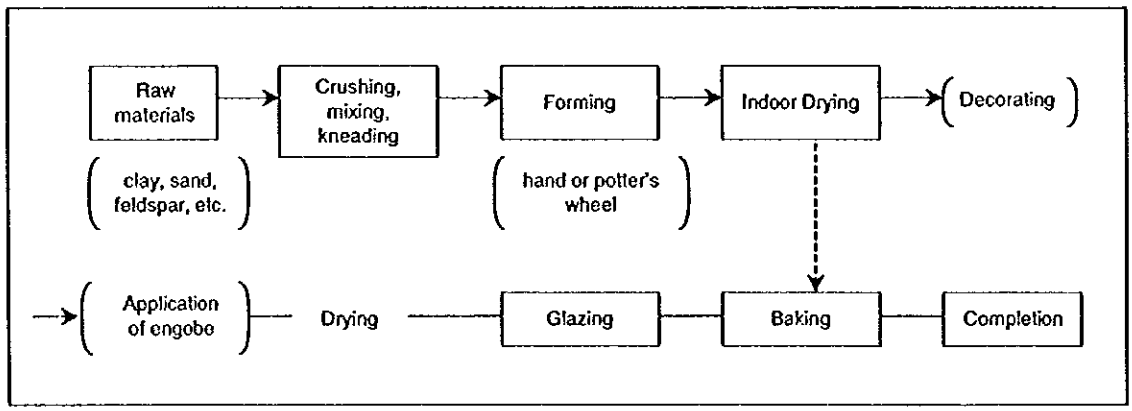
4.3.3.1 Current state of the ceramics industry

Dan Kwian Village in Nakhon Ratchasima has been long known as a ceramics producing center. At present, there are approximately 70 ceramic shops, most of which are small in size but handle the entire process from forming to sales. Originally, they have manufactured household ceramic products such as water jars and salad (Somtam) bawls. In the late 1980s, as the province began to have interaction with BMR in terms of movement of people and goods, the ceramic shops found new markets and their products changed significantly. Today, they display and sell a variety of products along the road, including gardening tools, pots and vases decorated with patterns showing tree leaves, and ornaments of various shapes including animals and other objects. On the other hand, ceramics in Khorat are made from brownish clays with a high iron content and are baked in a simple mound-shaped kiln. Major products include large pots and jars that exceed 1m in diameter.

As clays produced in Northeast contain iron, they can be baked at a relatively low temperature by burning shrub wood materials. When baked, they turn into blackish in color and are very glossy, similar to the Nanban ware in Japan (non-gloss porcelain introduced during the Momoyama period (the late 16th century). In Dan Kwian, a ceramic shop made ceramic boards engraved with imitated Khmer ornaments and statues of Buddha. These ceramic products are made by pouring the clay mixture into a pattern made of soft resin, followed by natural drying in a shelter. The use of the pattern results in high productivity.

A shop has developed new products that are made by gluing tea leaves to finished ceramic products. It displays a variety of designs on its web site. Each product has unique design and is made by a female artist who graduated from an art college in the U.S. She is gaining popularity and speaks at various seminars. This is a fine example suggesting a desirable direction for the ceramics industry.

The production process of ceramic shops in Dan Kwian is illustrated as follows.



Note that products without decoration are made in the shorter process (shown by dotted lines). Unglazed products account for large portions of production in Dan Kwian.

4.3.3.2 Future outlook for the ceramics industry

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

They have called experts working in other areas for help, but not much improvement has been made because of local conditions peculiar to Northeast that have to be taken into account when improvement measures are devised. As the increase in yield rate leads directly to profits, it should be given of priority. Clearly, a support system is required to find solutions, including a testing and research facility in the regional center.

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

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

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

As ceramics are closely associated with everyday life and people tend to relate ceramic products with a particular producing area, the ceramics industry

in Dan Kwian should market unique products with a clear identification. Also, they should use the Internet for the purpose of exploring new markets.

4.3.4 Silk Industry

4.3.4.1 Current state of the silk Industry

Thai people are composed of several ethnic groups such as Lao and Khmer. Naturally , their clothes reflect traditional patterns and colors of each ethnicity they originate, but these traditional clothes are forgotten or changed in the wave of modernization. In South Isarn including Surin and Buri Ram, however, a unique culture is maintained by Khmer Thais who constitute large portions of regional population.

They weave special splashed patterns that is similar to the Khmer splashed patterns made in Cambodia. Splashed patterns is a weaving technique originated in India and widely used throughout Asia including Japan. Several fine fabrics are bundled and knotted by fabrics according to a desired pattern. They are then dyed to produce dyed and white parts, which are unbundled and woven to create a variety of geometric patterns. The technique has been widely inherited over many generations.

The four provinces produce raw silk, although in small quantities, which was used to produce textiles by farms. The silk industry today has been growing on this foundation. The most well-known producing area is Pak Thong Chai in Nakhon Ratchasima. Silk produced here is known as Khorat silk and is currently made by 200 shops of varying sizes. Other producing centers include Ban Khwao in Chaiyaphum and Sa Wai in Surin, where farms are primary producers on a contract basis and silk production serves as an important source of income for them.

Recently, however, the silk industry uses less and less locally produced silk which is increasingly replaced with the product from other producing centers (mainly Phet Cha Bun) or imports from China and Vietnam, and local production is on the decline.

4.3.4.2 Future outlook for the silk industry

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

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

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

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

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

4.3.5 Machinery Industry

4.3.5.1 Current state

The machinery industry is considered to be a self-autonomous subsector only when it maintains self-sustaining, integrated production capabilities and organizations from product development, to design, manufacture, inspection and testing, which must be supported by resources to market the industry's products effectively.

Subcomponents of the machinery industry that have relatively strong presence in the target provinces are farm tractors, buses, special vehicles, rice sweepers, and automotive parts. Some of them appear to have the integrated production process although product development and design capabilities are not known. In fact, they manufacture products for OEMs to their specifications or products with copied designs. While such practices do not consume much management resources, they do not produce significant profits. Nevertheless, the machinery manufacturers have the ability to provide maintenance and repair services for the above products.

Some parts used by the machinery manufacturers operating in the provinces are imported from neighboring countries including China, but they have quality problems. Special steel materials (e.g., stainless steel, heat resisting steel, and load bearing steel) are mostly dependent on imports, making the manufacturers lose competitiveness in terms of price and delivery in the Bangkok Metropolitan Region. Meanwhile, they suffer from shortages of skilled workers who are indispensable in various machinery production processes. The existing pool of skilled workers is steadily aging, likely to affect the industry's production capabilities in due course. It is therefore an urgent task for the industry to attract and train young workers to reinforce the skill base.

Finally, production equipment is generally deteriorated due to aging, particularly machine tools that were mostly made by leading manufacturers in Europe, the U.S., or Japan. Naturally, automation appears to be a future challenge for the industry.

4.3.5.2 Future outlook

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

At present, joint ventures with Japanese manufacturers operating in Nakhon Ratchasima are capable of supplying parts for office equipment, television sets, video mechanisms and printers. However, the production system for such precision machined parts is primarily supported by Japanese suppliers who invest in the area and their production techniques, which have still to be transferred to local manufacturers.

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

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

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

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

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

4. To improve the working environment for precision machining, i.e., better environmental control to reduce dust in the air and provide

constant temperature and humidity conditions (most manufacturers seem to have sufficient land and building space).

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

6. To modernize production management practices (also applicable to other subsectors), which will produce immediate benefits such as the introduction of PCs into design and process control departments, the ability to understand actual production capacities and skills, and the establishment of a formal quality assurance system.

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

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

Chapter 5 Evaluation for Development Potentials and Constraints in Each Province

Chapter 5 Evaluation for Development Potentials and Constraints in Each Province

5.1 Problem Analysis and Objective Analysis through Workshops

5.1.1 Objectives, Methodologies and Schedules of Workshops

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

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

A draft of the regional industrial development plan covering the four provinces is to be presented in Workshop C. Through the process of Workshops B and C, the plan was and is to be revised and adjusted to the opinions and comments of the local people. Workshops D and E are the presentation of the draft final plan both in Bangkok and Nakhon Ratchasima for the dissemination of the plan.

Initially, the study team planned to have 8 workshops in total only for the problem analysis of the four provinces. Those workshops were to be participatory group discussions. Afterward, the number of workshops was reduced to four in response to the suggestion of the counterpart. The major reason for reducing the number of workshops, according to the counterpart, was time constraint of local participants, mainly those from the private sector in the

province concerned. Consequently, the workshop for the problem analysis was held once for each province.

The schedule for each workshop is shown in Table 5.1-1. For the workshops in Nakhon Ratchasima and Buri Ram, the study team took initiative for the operation and the local consultants conducted the rest two workshops in Surin and Chaiyaphum. In Buri Ram, one of the local consultants took the role of the moderator for the workshop, with the assistance of the study team, for the purpose of on the job training and the preparation for the rest two workshops.

Table 5.1-1. SCHEDULE OF WORKSHOPS

		Nakhon Ratchasima	Buri Ram	Surin	Chaiyaphum
Workshop A	Problem Analysis	18-Jan	20-Jan	24-Jan	26-Jan
Workshop B	Objective Analysis and Development Directions	9-Feb.	10-Feb.	15-Feb.	17-Feb.
Workshop C	Analysis of Regional Industrial Development Plan	21-Mar			
Workshop D	Presentation of Regional Industrial Development Plan	26-May in Bangkok			
Workshop E	Presentation of Regional Industrial Development Plan	29-May			

5.1.2 Workshops A (Problem Analysis)

Workshops A consist of explanation of the purpose of the workshops, introduction of PCM as a tool used for problem analysis, sessions of problem analysis on the industrial development in the provinces concerned. The purpose of Workshops A was to discuss and share the problems in each province in terms of industrial development. Since this was the first time for local people to use problem analysis of PCM, the team explained the participants the overview of PCM as well as how to conduct problem analysis sessions.

Following the introduction of the PCM method, the session for selecting a core problem and specifying direct causes was conducted with the lead of the moderator. In order to find out the core problem, a question such as "What is the major problem of industrial development in the province?" was asked to the

participants[1]. Among the problem cards presented by all the participants, one card was selected with the consent of themselves. The major criterion for selecting the core problems was the coverage of important issues in the province. Next, direct causes were also placed in the same way the core problem was selected. After the selection of the direct causes, two sub groups consisting of the participants were formed, and the two groups separately analyzed root causes for each of direct causes assigned. The results of the discussion by the two sub groups were presented by the representatives of the sub groups and shared by all the participants.

5.1.2.1 Results of Workshop A in Nakhon Ratchasima

The results of Workshop A in Nakhon Ratchasima were as follows.

(1) Core Problem and Direct Causes of Nakhon Ratchasima

The card selected as the core problem in **Nakhon Ratchasima** was:

"Competitiveness of local products is low."

The participants defined six direct causes of the core problem. The direct causes were:

a) Marketing capability is low;
b) Cost of production is high;
c) Production skills are limited;
d) Quality of products does not meet international standards;
e) Government support for R&D is not sufficient; and
f) Appropriate technologies are not used.

Further details including the problem tree after revision by the team are shown in ANNEX II-1. Some revisions were made by the team so that everyone could understand cause-effect relationships.

[1] This leading question was used in Nakhon Ratchasima. For the rest three provinces, the question was modified slightly. That was "What is the major problem of industrial promotion in the province?"

(2) Objective tree of Nakhon Ratchasima

An objective tree is developed by replacing the problematic situations in the problem tree with the improved situations. The core objective set for the industrial development of Nakhon Ratchasima was:
"Local products gain competitiveness."

In order to achieve the core objective, various means were considered. As a result, six direct means were set as follows:

a) Marketing capability improves;
b) Cost of production remains low;
c) Production skills are improved;
d) Quality of products does meet international standards;
e) Government support for R&D increases; and
f) Appropriate technologies are used.

If the six direct means are achieved, the core objective will be achieved (ANNEX II-1).

(3) Findings through the Workshop in Nakhon Ratchasima

In Workshop A, there were a few private sector people attended. As a result, the industry in the province was not so deeply analyzed from the viewpoint of the private sector. Existing serious problems of the private sector in Nakhon Ratchasima were to be studied by having interviews with companies.

In spite of that, there were also some important findings from the workshop. The first one was that there are not many top managers having appropriate and modern management knowledge and skills. One of the root causes of the direct causes of a), b), d) and f) are derived from insufficient management knowledge and skills of top managers. Although the attendants did not recognize that aspect in the workshop, marketing capability, cost control of products, conformance with quality standards and selection of appropriate technologies are all managerial issues. In fact, there was a difficulty for proceeding the workshop because of the

participants' misunderstanding of the meanings of managerial terms such as marketing and quality standards.

5.1.2.2 Results of Workshop A in Buri Ram

The results of Workshop A in Buri Ram was different from Nakhon Ratchasima. Thanks to many participants from the private sector, the focus of the discussion was on the knowledge of entrepreneurs and top managers.

(1) Core Problem and Direct Causes of Buri Ram

The core problem selected was:

"Entrepreneurs' knowledge is not enough to develop/promote existing and new business."

Direct causes to the core problem found were five:

a) Entrepreneurs stick themselves to the traditional style of doing business;
b) Opportunities to learn new knowledge are limited;
c) Government support units are not functioning;
d) Investment from outside of the province is little; and
e) Entrepreneurs are not interested in seeking for management knowledge.

Further details are shown in ANNEX II-2.

(2) Objective tree of Buri Ram

The core objective set for the industrial development of Buri Ram was:

"Entrepreneurs accumulate their knowledge about developing existing businesses as well as promoting new businesses."

Starting from the core objective, five direct means were set:

a) Entrepreneurs find out new ways of doing business;
b) Opportunities to learn new knowledge are expanded;

c) Government support units collaborate among them;
d) The province becomes attractive for investors from outside; and
e) Entrepreneurs understand the importance of management knowledge.

By achieving those five direct means, the core objective will be achieved (ANNEX II-2).

(3) Findings through the Workshop in Buri Ram

The participants considered that human resource development in the field of entrepreneurship was important. In order for the province to increase the number of entrepreneurs, it needs to educate people in managerial knowledge and skills.

Another issue to be addressed was the importance of investment promotion. Different from Nakhon Ratchasima, Buri Ram has not been able to attract much investment. Although there are some investment in the field of labor intensive light industries, the potential of Buri Ram as an investment destination has not been fully exploited.

For both issues, development of entrepreneurs and investment promotion activities, it is necessary for the province to raise people's awareness that industrial development in the province is the key for its future economic success. Without changes in the mindset of the people in the province, both in the private and public sectors, neither effective investor attraction nor expansion of local industries will be materialized. When people become aware of the importance of investment promotion, there will be a chance for the province to create its image as an attractive investment destination by conducting various promotion activities.

5.1.2.3 Results of Workshop A in Surin

(1) Core Problem and Direct Causes of Surin

The core problem selected at the workshop in Surin was:

"Entrepreneurs do not have enough knowledge and understanding in industry."

This was similar to that of Buri Ram.

Direct causes of the core problem were:

a) Entrepreneurs cannot find industrial information;
b) There are few experts in any industrial sub-sectors;
c) People do not know how to learn management knowledge;
d) People's motivation for acquiring knowledge is not high; and
e) Entrepreneurs do not cooperate with each other.

Further details are shown in ANNEX II -3.

(2) Objective tree of Surin

Surin's core objective for its industrial development was:

"Entrepreneurs accumulate sufficient knowledge and understanding in industry."

Direct means were set as follows:

a) Entrepreneurs can access to industrial information;
b) The number of experts in industrial sub-sectors increases;
c) People realize the importance of learning management knowledge;
d) People's motivation for acquiring management knowledge becomes high; and
e) Entrepreneurs cooperate with each other.

Once the direct means are achieved, the core objective will be materialized (ANNEX II -3).

(3) Findings through the Workshop in Surin

The core problem selected in Surin is almost equal to that of Buri Ram. However, the environment for industrial development in Surin is severer than in Buri Ram. Because of the geographical disadvantage as well as limited resources available for industrial development including natural

resources, people in the province are facing with the difficulty for finding business opportunities.

Such a situation has depressed people in the province very much. Consequently, existing companies tend to focus on protecting and maintaining their vested interests. In addition, top managers of existing companies are already old in many cases and not active in terms of business development.

In order to develop industry in Surin, the province needs to have a strong core player who can organize the local business community by breaking the status quo and take the lead for industrial development. Under such a leader, a centripetal force into the provincial industrial development may start working. The centripetal force means the coordination between the public and private sectors as well as the cooperation within the private sector.

5.1.2.4 Results of Workshop A In Chaiyaphum

(1) Core Problem and Direct Causes of Chaiyaphum

The participants in the workshop thought that the major problem for the province's industrial development was coordination between public and private sectors. The core problem selected was:

"Poor coordination between public and private takes place."

As the direct causes, there were four issues:

a) The industrial development plan of Chaiyaphum does not have clear directions;
b) The government does not motivate investors;
c) Useful information on investment climate and procedures is not available in one place; and
d) Entrepreneurs are not active in cooperating with each other.

Further details are shown in ANNEX II -4.

(2) Objective tree of Chaiyaphum

The statement of the core objective was:

"Cooperation between public and private becomes active."

In order to achieve this objective, there are for direct means:

a) The industrial development plan of Chaiyaphum shows clear directions;
b) The government motivates/promotes investors;
c) Useful information on investment climate and procedures is available in one place; and
d) Entrepreneurs themselves cooperate actively with each other (ANNEX II -4).

(3) Findings through the Workshop in Chaiyaphum

Business people in the province are suspicious of the government. They think the government wrongly understands the economic conditions in Chaiyaphum. Moreover, they feel inconvenience with the government service. Among them are time consuming registration procedures and disorganized information on the investment climate.

On the other hand, local business people also recognize problems in terms of the cooperation among them. They are reluctant to cooperate with each other, because they think cooperation will increase and intensify business competition among them. According to the participants in the workshop, the market size for the companies in the province is too small to share with their competitors, and raw materials for their production are also too scarce to be shared. Although the participants addressed the issue as a problem for the province's industrial development, they seemed not seeing the benefits of cooperation within the private sector in the province. It is necessary to change myopic thoughts and behaviors of business people in the province. If their eyes are opened to the outside of the province, not only the market size in their view but also business chances will increase dramatically.

5.1.3 Conclusion of Problem Analysis and Objective Analysis

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

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

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

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

There is a common issue for industrial development of the four provinces from the problem and objective analyses. That is government support and service activities including preparation of information on investment climates in a single place in each province, provision of technical and management

consulting service and training, and intensive communication with the private sector. However, under the current situation, technical and management consulting service is more important for Nakhon Racthasima, and for the rest three, entrepreneurial development and investment promotion activities may be the priority.

5.1.4 Connection between Problem Analysis and Development Directions of the provinces

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

The process of formulating the development directions and strategies of the four provinces is shown in Figure 5.1-1.

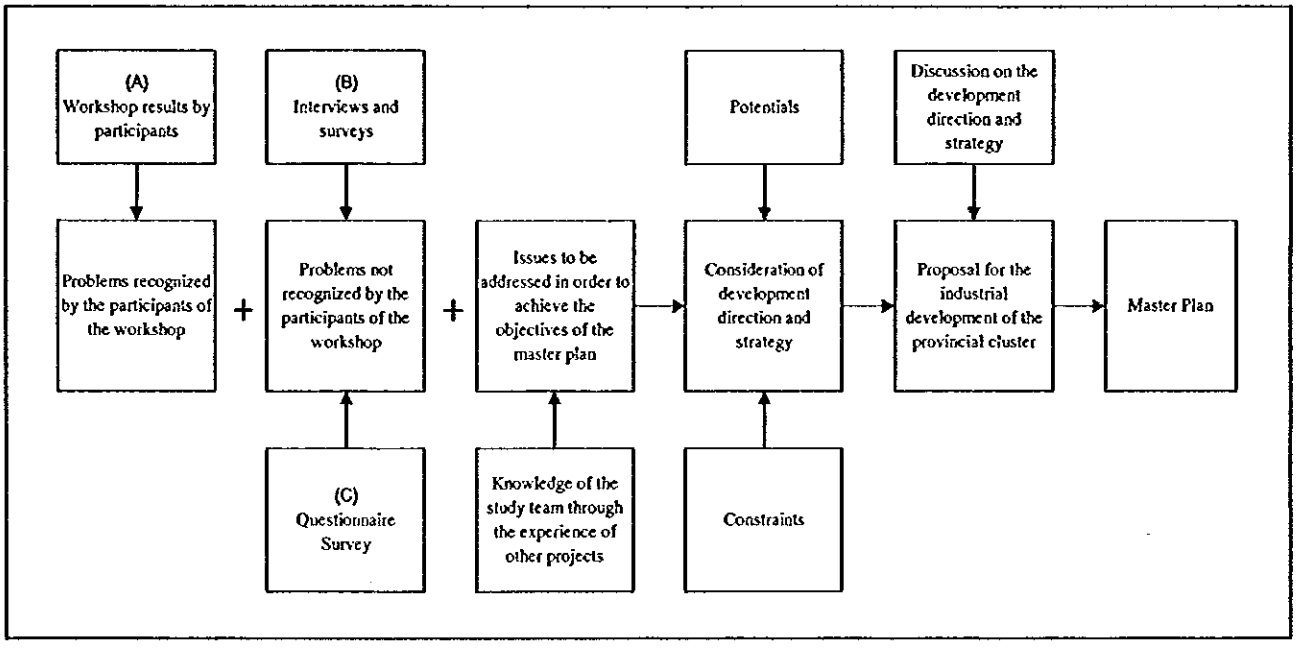


Figure 5.1-1. PROCESS OF FORMULATING DEVELOPMENT DIRECTIONS

5.2 Development Potential and Constraints in the Target Provinces

5.2.1 Assessment of Development Potential of the Provinces

The current state of each province and the Provincial cluster analyzed from the perspective of industrial development. As the basis of analysis, the study team looked into (A) the results of the workshops (problem identification and analysis) participated by representatives of local governments and organizations, as well as (B) the results of the interview and (C) questionnaire surveys of selected enterprises and the interview survey of government bodies and related organizations, which were carried out concurrently with the workshops (Figure 5.1-1). Generally speaking, the results of the field surveys revealed a clear difference between Nakhon Ratchasima and other three provinces in terms of depth and breadth of industrial foundation. It is important to realize that Buri Ram, Surin and Chaiyaphum are still maintaining their economic base in processing of primary resources including farm products and mining, although other industries are emerging – different types to reflect local conditions peculiar to each province. On the other hand, the industrial base in Nakhon Ratchasima has successfully extended to advanced processing stages while diverse industries are growing. Thus, the target provinces, although being treated as one region, differ in their initial settings as they start the industrial development process.

(1) Development Potential of the Provinces

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

(a) Comparative advantages of Nakhon Ratchasima

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

(b) Comparative advantages of Buri Ram

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

(c) Comparative advantages of Surin

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

(d) Comparative advantages of Chaiyaphum

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

(2) Assessment of Development Potential of the Provinces

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

Comparative Advantages of the Nakhon Ratchasima Provincial Cluster

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

5.2.2 Evaluation of Development Constraints

(1) Development Constraints in the Provinces

From the standpoint of attracting industrial projects, each of the target provinces has various constraints as well as advantages. The following tables summarize major constraints for industrial development in the four provinces.

(a) Nakhon Ratchasima

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

(b) Buri Ram

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

(c) Surinam

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

(d) Chaiyaphum

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

(2) Development Constraints in the Provincial Cluster

A major constraint commonly seen in the provincial cluster is the seasonal return of factory workers to home during the cultivation season. As economic activities and lifestyles in the area are firmly founded on agriculture, the seasonal shortage of factory labor is difficult to avoid and makes year-round production management difficult for most factories. Also, water shortage is a threatening problem in the provincial cluster as a whole, while the problem has surfaced in some provinces during the dry season.

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

Development Constraints of the Nakhon Ratchasima Provincial Cluster

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

5.2.3 Major Development Issues by Field

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

(1) Machinery and electric/electronics industries

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

(2) Farm product processing

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

(3) Work force and human resource development

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

(4) Local/traditional industries

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

(5) Industrial infrastructure

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

(6) Financial service for SMEs

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

(7) Investment promotion and industrial estate

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

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