No.49

A STUDY ON INDUSTRIAL SECTOR DEVELOPMENT IN THE KINGDOM OF THAILAND

PLASTIC PROCESSING AND CERAMIC TABLEWARE

THIRD YEAR FINAL REPORT

OCTOBER 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of Thailand, the Government of Japan has decided to conduct a study on the development of industrial sectors in the Kingdom of Thailand and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent to Thailand a study team headed by Mr. Akira Inoue, Japan External Trade Organization, during the periods from November 1 to December 20, 1990 and from June 11 to 30, 1990.

The team held discussions with the Government of Thailand officials concerned and conducted field surveys in the selected areas. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will serve for the development of the industrial sectors concerned and contribute to the promotion of friendly relations between our countries.

I wish to express my deep appreciation to the Government of Thailand officials concerned for the close cooperation which they extended to the team.

October 1990

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

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(ABBREVIATIONS AND ACRONYMS)

AIST	Agency of Industrial Science and Energy
ASEAN	Association of South-East Asian Nations
BAAC	Bank for Agriculture and Agricultural Cooperatives
BOI	Board of Investment
BOT	Bank of Thailand
CEM	Council of Economic Ministers
CVD	Counter-vailing Duties
DEP	Department of Export Promotion
DIP	Department of Industrial Promotion
DIW	Department of Industrial Works
DOVE	Department of Vocational Education
EIC	Economic Industrial Center
EIMP	Export Industry Modernization Program for Small & Medium Industry
EIPC	Eastern Industrial Promotion Center
FIDC	Furniture Industry Development Center
FTI	Federation of Thai Industries
GATT	General Agreement on Tariff and Trade
IEAT	Industrial Estate Authority of Thailand
IEPD	Industrial Economics and Planning Division
IFCT	Industrial Financial Corporation of Thailand
IMF	International Monetary Fund
IPC	Industrial Policy Committee
IPC	Industrial Promotion Center
ISD (ISI)	Industrial Service Division
ITVE	Institute of Technology and Vocational Education
JPPCC	Joint Public-Private Consultative Committee
KMIT	King Mongkuts Institute of Technology
MIDI	Metal-working & Machinery Industry Development Institute
MITI	Ministry of International Trade and Industry
MOC	Ministry of Commerce
MOE	Ministry of Education
MOF	Ministry of Finance
MOI	Ministry of Interior
MOI	Ministry of Industry
MOSTE	Ministry of Science, Technology and Energy

MUA	Ministry of University Affairs
NESDB	National Economic and Social Development Board
NIES	Newly Industrializing Economies
NIPC	Northern Industrial Promotion Center
NISD	National Institute for Skill Development
NPC	National Petrochemical Complex
NSO	National Statistics Office
OBID	Office of Basic Industry Development
OCSB	Office of the Cane and Sugar Board
OECD	Organization for Economic Cooperation and Development
OECF	Overseas Economic Cooperation Fund
OEM	Original Equipment Manufacturing
PID	Petroleum Industry Division
PIO	Provincial Industrial Office
RNEC	Regional Non-formal Education Center
SICGF	Small Industries Credit Guarantee Fund
SIFO	Small Industries Finance Office
SMEA	Small and Medium Enterprise Agency
TDRI	Thailand Development Research Institute Foundation
TID	Textile Industry Division
TMDPC	Thailand Management Development and Productivity Center
TPIA	Thai Plastic Industry Association
TRIM	Trade-related Investment Measures
VAT	Value-added Tax

INTRODUCTION

Introduction

This is the Final Report for "A Study on Industrial Sector Development in the Kingdom of Thailand (Third Year)".

The study was based on the "Scope of Work for the Study on Industrial Sector Development in the Kingdom of Thailand", signed on August 18, 1987, by the Government of the Kingdom of Thailand and the Japan International Cooperation Agency (JICA).

The study was entrusted to the "Joint Venture for Study on Industrial Sector Development in the Kingdom of Thailand" organized by the Japan External Trade Organization (JETRO) and NKK Corporation, and was carried out from late October 1989 to September 1990. The third year of study focused on two sectors and a total of four products, namely the plastic processing industry (household goods and industrial parts) and the ceramic industry (tableware and novelties).

A field survey in Thailand was carried out from November 1 to December 20, 1989, and a supplementary field survey from June 9 to 16, 1990. Interim reports were submitted to the Thai government in June 1990 and were accompanied by explanations and deliberations. Also during this time, a questionnaire survey was conducted in Japan and studies on other nations were carried out through JETRO overseas offices.

The present Report consists of the following five parts and an appendix: the Introduction, I. Conclusion (Comprehensive Programs), II Policies and Regulations, III. Plastic Processing, IV. Ceramics, and V. Total Review of First to Third Years. Chapters III and IV provide an overview of the current state of the industries covered, including the situation in third countries, and extracts the problems in the same, while the Conclusion proposes comprehensive programs to deal with these. Further, Chapter V summarizes the problems in industrial policies learned through the first to third year surveys and makes some proposals regarding them.

The JETRO-NKK Joint Venture organized a Study Team consisting of the following members:

Akira INOUE	Team Leader (Senior Economist and Director, Development Survey Project Group, JETRO)
Sadao SHIMAZU	Deputy/Investment Promotion and Export Promotion (Deputy Director, Development Survey Project Group, JETRO)
Kota NAGAI	Deputy/Export Industry Promotion/Plastic Processing (Deputy Director, Development Survey Project Group, JETRO)
Toshio KUROSAKI	Economist/Export Industry Promotion/Ceramics (Deputy Director, Development Survey Project Group, JETRO)
Toshio INOMATA	Economist/Export Promotion and Export Industry Promotion (Assistant Director, Development Survey Project Group, JETRO)
Jun TSUNEKAWA	Economist/Export Industry Promotion/Plastic Processing (Assistant Director, Development Survey Project Group, JETRO)
Osamu MIZUTANI	Economist/Investment Promotion (Survey in Japan) (Assistant Director, Development Survey Project Group, JETRO)
Eiichi ASANO	Economist/Export Promotion (Survey in Japan) (Deputy Director, Development Survey Project Group, JETRO)
Shoichi SATO	Deputy/Industrial Engineer (Production and Technology) (Deputy General Manager, Maritime Development Dept., NKK Corporation)
Hiroyuki TANAKA	Economist/Management (Management and Finance)

	(Manager, Maritime Development Dept., NKK Corporation)
Munetaka IKEBE	Industrial Engineer/Project Survey and Analysis/Plastic Household Goods (Senior Chief Consultant, Martech Co.)
Kakeo HATTORI	Industrial Engineer/Project Survey and Analysis/Plastic Industrial Goods (Research Director, Martech Co.)
Nobukazu YAMAUCHI	Industrial Engineer/Project Survey and Analysis/Ceramics (Consultant, Japan Ceramic Engineering Co.)

1. Background, Objective and Method of Study

1-1. Background and Perspective

After the first oil crisis, the world economy entered a period of low growth. The Asian NIEs and ASEAN nations managed to achieve economic growth rates higher than the world average. With the advent of the 1980s, however, the ASEAN nations were confronted with severe economic problems due to the plummeting prices of primary products and crude oil and the resulting drop in foreign currency earnings and increased debt.

The ASEAN nations found themselves in dire straits in the 1980s due to the changes in the international environment and embarked on a policy of quickly promoting export industries to increase foreign currency earnings. With this in mind, they have been promoting local industry and actively encouraging foreign investment. On the other hand, Japanese companies and other firms from the industrialized nations and Asian NIEs have been accelerating direct investment in developing countries, and the ASEAN nations in particular, to deal with the changes in their domestic industrial structures and the reorganization of the international division of labor. They have been transferring capital, technology, and know-how to the ASEAN nations and thus contributing to industrial development there. Japan in particular has been requested to participate in this process.

Since the 1970s, a horizontal division of labor has spread among Japan, the U.S. and the Asian NIEs, leading to a steady expansion of trade in manufactured goods. As the ASEAN nations join in full measure, a horizontal division of labor is being established throughout the entire Asia Pacific region. This will represent the most significant structural change in the world economy in this century.

In Thailand, one of the ASEAN nations, the focus of the economy is shifting from agriculture to manufacturing. Since 1984, manufacturing has taken over first place in terms of share of the GDP (gross domestic product) from agriculture, forestry, and fisheries. This is an indication of the changes wrought in the economic structure by the industrialization program in effect since the 1960s.

Thai industrialization began with import substitution, primarily in the light industries, but it was gradually expanded to cover other fields as well. Starting in the early 1970s, the country also began to work towards export-oriented industrialization, but

these efforts proved to be ineffective. Since 1977, export-oriented industrialization has been promoted with an emphasis on fostering agro-based industries and the expansion of foreign investment. In 1983, further supplementary measures were taken, with export ratios being clearly specified for export promotion projects, controls relaxed on foreign equity participation, and so on. Recent Thai economic policies have focused both on greater economic efficiency and the expansion of exports. The current (sixth) 5-year plan (1986-91) stresses the increase of export revenues through diversification of agricultural products, and promotion of agro-industries and of export industries.

Government efforts have led to steadily rising exports. In particular, there has been striking growth in exports of textile products, ICs, canned marine products, toys, and other industrial goods.

Starting from the second half of 1986, along with the appreciation of the yen and the hike in the value of the currencies of the Asian NIEs with respect to the dollar, there was an increasing trend among corporations in Japan and the NIEs to look towards the ASEAN countries for production bases for labor-intensive export products and the like. Thailand, in particular, offers political stability, incentives for export-oriented investment, and high-quality, reasonably-priced labor, and this has resulted in soaring direct investment by Japan, Taiwan, and other NIEs.

In the fall of 1986, Japan's Ministry of International Trade and Industry proposed a program for the active assistance of other governments and companies in the Asian nations in four fields:

(1) Improvement of infrastructure for export-type industries
(2) Overall technological cooperation in nurturing strategic export industries (cooperation in manpower training and marketing)
(3) Investment, etc., for nurturing strategic export industries
(4) Advice concerning improvement of the tax systems, investment policies, etc., in developing countries.

The Thai government, in particular the Ministry of Industry, requested the cooperation of the Japanese government after receiving this proposal. The JICA sent a Scope of Work survey mission to Thailand in August 1987 to discuss the industries and products to be surveyed with the Thai government. A plan for the survey was drawn up and the first-year survey was begun in January 1988. The industries and products

decided upon are as shown below.

Industries and Products to be Surveyed

	Industry	Products
1st year	Molds & Dies	Molds and dies (for plastics), Molds and dies (for presses)
	Toys	Plastic and metal toys, Stuffed toys
2nd year	Textiles	Textiles,garments
	Wooden Furniture	Wooden furniture
3rd year	Processed Plastic Goods	Houseware,industrial goods
	Ceramics	Tableware, novelties

1-2. Objectives and Survey Items

The objective for the third year is to survey the plastic processing and ceramic industries and formulate a comprehensive program for development and export promotion.

In the formulation of the program, attention has been given to:

[1] Selection of the most suitable and practical plans

[2] Presentation of as much detail as possible on program objectives, content, costs, schedule, effects, etc.

[3] Presentation of the program divided into short-, medium-, and long-term parts

Specific items to be surveyed by the study have been established as shown below based on the S/W (concluded August 18, 1987):

(1) Summary of Selected Industries

a) Current state of production items, production, trade, and companies

b) Investment, technical tie-ups, financing, taxation, promotion of foreign investment

(2) Current State of Selected Industries and Production Plants

a)Manufacturing processes and specifications

b) Technical level (quality control, etc.)

c) Product development (designs, etc.)

c) Product development (designs, etc.)

d) Corporate management (business management, fund-raising, etc.)

e) Sales strategies (market surveys, marketing, etc.)

f) Relation with peripheral industries (raw materials, equipment, etc.)

(3) Survey on Export Markets by Product

a) Survey of supply and demand and imports in main importing countries

b) Marketability of products in main importing countries

(4) Preparation of Comprehensive Programs for Development of Selected Industries and Export Promotion

a) Institutions and government policies

b) Improvement of technology

c) Product development

d) Sales strategies

e) Business management

f) Manpower training

g) Improvement of industry infrastructure

(5) Finding Japanese Companies Desiring Joint Ventures and Technical Tie-ups in Thailand

a) Survey of companies with joint ventures or technical tie-ups

b) Preparation of list of companies desiring joint ventures or technical tie-ups

1-3. Methodology

The methodology of the study is as follows:

(1) Advance Preparation in Japan

a) Collection and analysis of existing materials and statistics in Japan

b) Preparation of detailed plan for overseas field surveys and work in Japan

c) Preparation of inception report and survey schedule

d) Preparation of question forms

(2) Field Surveys

a) Explanation of inception report and discussions on survey plans

b) Collection of information through interviews with related organizations and deliberations on same

d) Preparation and presentation of progress reports

e) Presentation of interim reports, deliberation on the program, and supplementary surveys

(3) Third Country Surveys

a) Survey of third country markets

b) Survey of industries in competing countries

c) Survey of past industrial and export promotion policies

(a), (b), and (c) were conducted through surveys of written materials and surveys commissioned through JETRO overseas offices.

(4) Survey in Japan

a) Summary and analysis of field survey results

b) Summary and analysis of third country survey results

c) Collection and analysis of interviews with related companies in Japan, on-site surveys, and questionnaire surveys

d) Overview of and deliberation on specific problems

e) Preparation of and deliberation on interim reports

f) Preparation of comprehensive program and final report

Of the above, (d), (e), and (f) were performed through discussions with group members and experts in the field.

2. Survey Schedule and Content

The schedule and content of the third-year survey are described below.

2-1. Advance Preparations in Japan

- Collection of materials and information
- Preparation of plans for third-country surveys and instructions

(Survey of third country markets)

Plastic processing	U.S./U.K.
Ceramics	U.S./Australia

(Survey of competing countries)

Plastic processing	Korea/Hong Kong
Ceramics	Korea/(Taiwan)

• Deliberation on plans for field surveys

2-2. Outline of Field Surveys

2-2-1. Survey Outline

[1] Survey period: November 1 - December 20, 1990

[2] Composition of survey team

Team leader and members	Total 11
JETRO	6
NKK	5

[3] Field office: Located in the ISI, under the DIP (Department of Industrial Promotion), Ministry of Industry

[4] Cooperating Thai organization

The Thai counterpart was the DIP of the Ministry of Industry. To help smooth implementation of the survey, a Steering Committee was established comprised of the NESBD, Ministry of Commerce, Board of Investment (BOI), related industry associations, and other related parties.

2-2-2. Number of Field Interviews and On-Site Plant Surveys

The number of plants surveyed and the number of interviews held with related organizations in the field survey were as follows:

Party visited	No.
Plastic processing factories (including factories in related fields)	36
Ceramic factories (including raw material and export relatedfactories)	49
Bangkok region	19
Chiengmai region	13
Lampang region	17
Government organizations	44
Organizations, schools, etc.	21
Total	150

2-3. Survey in Japan

(1) Analysis of the results of field surveys and work in Japan
(2) Interviews with related institutions and corporations in Japan
(3) Analysis of third country survey results
(4) Questionnaire surveys in Japan

During the term of the field survey, a questionnaire survey was run in Japan on companies interested in overseas investment. The state of posting and recovery of the questionnaires was as follows:

Companies posted to	No. sent	No. recovered	Recovery rate
Plastic industrial parts		89	43%
Plastic houseware	300	33	36%
Ceramics	300	80	27%

(5) Preparation of and deliberation on program proposals
(6) Preparation of interim reports

Note that during the survey in Japan (April 1990), two members of the counterpart organization (Mr. Wirat and Ms. Sweena) participated for about one month in the work in Japan, the deliberations on the programs, etc.

2-4. Interim Report and Supplementary Field Survey

(1) Survey period: June 11 (Monday) to 30 (Saturday), 1990 - 20 days

(2) Survey members: Six members of survey team (Inoue, Shimazu, Nagai, Kurosaki, Sato, Tanaka) (June 9 to 16: JICA Advisory Group also present in Thailand)

(3) Summary of work

(1) In the June 15 meeting of the Steering Committee, an explanation was given of the interim report on the industries covered by the third year survey, i.e., plastic processing and cermaics, and the problems in institutions and policies, based on the interim report, and the draft programs, an explanation was given of the three year review, questions were answered, and discussions held.

(2) Some corrections, opinions, etc. were submitted regarding the interim report, but in general approval was obtained of the same. There were no particular corrections or comments made on the draft programs or three year review.

(3) In the supplementary survey, the ceramic group (Inoue, Kurosaki, and Tanaka) surveyed the situation in the Northern Chiengmai and Lampang regions from June 17 to 22 and spent the rest of the time surveying the Bangkok region.

(4) In the supplementary survey, particular stress was placed on the following and the results anticipated were substantially obtained:

(Plastic processing)

- State of compound industry and molding machine manufacturing industry in relation to plastic processing
- State of preparation for establishment of training facilities for plastic processing

(Ceramics)

- State of preparation for establishment of Lampang Ceramic Center and interest

of related industries etc.

- Trends in problem of ceramic materials
- State of activities of large ceramic companies in Bangkok

(Institutions and Policies)

- State of progress in reorganization of Ministry of Industry for strengthening industrial sector policy functions
- Changes in roles and responsibilities of Ministry of Industry and other government organizations

2-5. Survey in Japan

- Analysis and summary of survey results
- Analysis and summary of third country survey results
- Deliberations with related institutions concerning establishment of comprehensive programs
- Final summary of the comprehensive programs
- Preparation of the final report (draft)

PART-I.
CONCLUSION

PART-I. CONCLUSION

Contents

PART-I. CONCLUSION

Chapter 1. Proposal of comprehensive Programs for Plastic Processing Industry

1-1. Main Problems

The Thai plastic processing industry started out in the 1950s as an import substitution industry. Starting in the 1980s, exports exceeded imports and today the industry is one of the main export industries of Thailand.

However, to achieve even greater development, the following problems have to be resolved:

(1) Necessity for Raising Technical Level Along with Diversification of Plastic Processed Products

At the present time, the plastic products being manufactured are diversifying from household goods and daily sundries to industrial parts for household electric and electronic appliances, automobiles, bicycles, etc. However, the production technology for industrial use plastic products, which require a high degree of precision, is not well developed overall in terms of the knowledge regarding materials, mold technology, molding technology, etc. There is considerable room for improvement.

(2) Lack of Comprehensive Policy For Promotion of Plastic Processing Industry

Up to now the Thai plastic processing industry has mainly developed based on private, free business activities. To promote even more development in the future, it is essential to reduce tariffs on raw materials and related machinery, promotion joint ventures in molds and dies and in the plastic sector, and take other policy measures. Further, there remain problems which must be handled by public organizations, such as the training of personnel and the promotion of special technology, with respect to the improvement of the technical level mentioned in (1) above.

(3) Greater Promotion of Exports

To further promote the exports of plastic household goods, daily sundries, etc., it

would be desirable to try to raise the processing and design capabilities of the processors and to provide more abundant overseas market information.

To resolve these problems, the following countermeasures and programs are proposed:

In implementing this proposal, it is essential that there be close cooperation with private industry and that policies be prepared and information be furnished for improving technology. Therefore, programs have been proposed which including establishment of such systems.

Table I-1. Comprehensive Programs (Plastic Processing Industry)

Package of measures	Programs	Method of implementation and schedule of implementation: Method	1st stage	2nd stage	3rd stage	
Drafting of policy regarding plastic industry and new establishment of function for promotion of same	Establishment of policy unit for plastic processing industry		o			
	• Preparation and implementation of promotion measures	Implementation of recommendations		o	o	(Continuous task)
	• Joint work with plastic related private organizations	Establishment of Industrial Committee		o	o	
	• Coordination with other ministries	Adjustments for implementation of promotion program		o	o	(Continuous task)
	• Establishment of information on plastics			o	o	(Continuous task)
	Statistics, industrial information Technology	Collection of data and information Plastic division of EIPC				
	• Support and coordination of activities of various organizations in Ministry of Industry			o	o	(Continuous task)
Promotion of industrial organizations and establishment of cooperative system among related organizations	Establishment of Plastic Industry Committee	Operation by policy unit	o	o	o	(Continuous task)
		Exchanges with related organizations		o		
Formulation and implementation of incentives for promotion of plastic processing industry	Program for promotion of plastic processing industry	Implementation of policies by plastic unit	o			
	• Encouragement of indirect exports and investment of small and medium sized enterprises	Cooperation with BOI		o		
	• Encouragement of molds and dies, secondary processing, and compounding industry	Cooperation with BOI		o		
	• Reduction of import tariffs on plastic processing machines and plastic molds	Cooperation with MOF		o		
	• Reduction of import tariffs on plastic materials	Cooperation with MOF		o		
	• Active use of institutional financing for investment of small and mediums sized enterprises	SIFO		o		

Package of measures	Programs	Method of implementation and schedule of implementation			
		Method	1st stage	2nd stage	3rd stage
Collection and dissemination of overseas information regarding household plastic goods and promotion of exports	Program for promotion of exports of household plastic goods by DEP				
	• Survey of trends in key overseas markets for household plastic goods (including collection of samples and catalogs)	Market research (DEP)	o	o	o
	• Announcement of results of survey	Announcement in journal of TPIA etc.		o	
	• Development of new products	Seminars and training		o	
	• Participation of superior products in overseas trade fairs	Establishment of selection committee	o	o	
	• Dispatch of export missions	DEP	o		
	• Preparation of directories	Cooperative projects among DEP, DIP, TPIA, and Plastic Club		o	o
Establishment of technical training organization regarding plastic processing	Establishment of plastic training division in EIPC	Deliberations with Industrial Committee	o		
		Engagement of experts		o	
	• Establishment of function for training skills of plastic molding and processing	Engagement of experts		o	
		Furnishing of equipment and materials		o	
		Training of personnel			o
	• Technical training function for testing and analysis of plastic materials	Engagement of experts		o	
		Furnishing of equipment and materials		o	
		Training of personnel			o
	• Commissioning of testing, analysis, research and development for plastic materials	Engagement of experts		o	
		Furnishing of equipment and materials		o	
		Training of personnel			o
	• Functions of information center	Training of service staff			o
	Collection of external technical information	Training		o	
	Accumulation of internal technical information	Announcement in TPIA journal			
	Opening of results to public	Publication of journal			o
	• Introduction of principle of beneficiaries paying for services	Guidance of unit			o

1-2 Countermeasures and Programs

<Countermeasure 1>
Establishment of new function of proposing and promoting policies relating to plastic Processing industry

The Thai plastic processing industry has enough leeway for increasing exports of household goods and daily sundries and the need is extremely great for meeting the rapidly rising demand for industrial parts in the export oriented assembly industries (electric and electronic equipment industries etc.), so the government should give positive support to the activities of private companies, including cottage-sized, small, and medium sized enterprises, in the areas of technical level, quality, improvement of productivity, and augmentation of production capacities. This requires the proposal and promotion of sectorial industrial policies for the plastic processing industry. It is absolutely essential to establish some policy unit which would take on a central role in this.

<Program 1>

Establishment of Policy Unit for Plastic Processing Industry

This unit would perform the following tasks:

1) Devise a promotion policy and implement promotion activities for the plastic processing industry

In the beginning, the main activity would be the implementation of recommendations contained in the report. The issues which would affect the industry in the future would gradually be considered. (ex. environmental problems)

2) Cooperation with plastic related organizations

To hold periodic meetings with private organizations (To listen to requests from plastic industries or to request cooperation from the sector or policies)

3) Coordination with other ministries:

The kind of problems to be discussed with related ministries are as follows.

When other problems occur, this unit would contact related ministries as required. With the Ministry of Commerce (exchange of market information), the Ministry of Finance (import tariff problems regarding raw materials and machinery), Ministry of Education and Ministry of Interior (Department of labor direction of training of skilled labor), Ministry of Science, Technology and Energy (clarification of division of duties, cooperation), BOI (policy for domestic raw materials, promotion policy)

4) Collection of information on plastics

It is impossible for the unit to collect information by itself, it is necessary to establish a system for the collection of basic statistics and information for making policy. regarding basic statistics and information on raw materials, it is necessary to establish a system which works in cooperation with the Information Center.

For reference, the statistics collected from the plastic industry in Japan are attached.

It is expected that the collection of technical information would be done by the plastic section of EIPC.

5) Assistance to other sections (including EIPC, mentioned later) and coordination with other sections of the Ministry fo Industry.

In particular, regarding the establishment of a technical training organization for plastic processing as mentioned in Program 5, in the preparatory stage, the functions and activities of the organization must be settled through an exchange of opinions and coordination with the private sector, The target project would then be realized through cooperation with and assistance from the related sectors. The policy unit would serve as the organizer or promotion of this project and therefore would preferably be established as early as possible.

Fig. I-1. Duties of Policy Unit For The Plastic Processing Industry

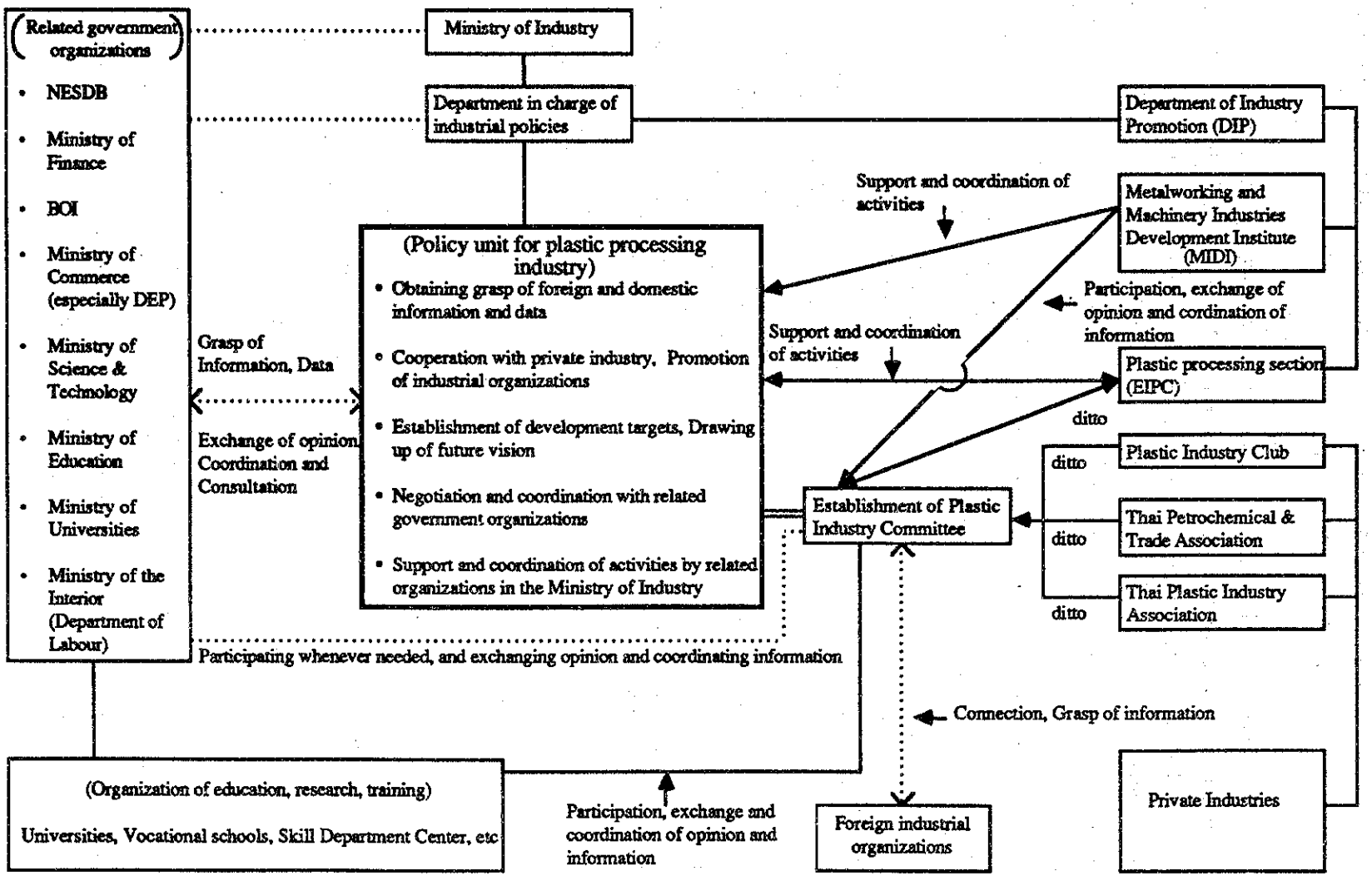


Table I-2. Statistics on Plastic Products

In formulating and realizing industrial sector policies, it is basic and important to obtain a grasp of the related statistical data.

The Japanese Ministry of International Trade and Industry prepares and publishes a "Plastic Product Statistics Monthly" and a "Yearbook of Plastics Statistics". Assembled there are statistics on the production, shipments, and inventories of individual products. The data is obtained by questionnaires prepared by MITI which are sent through the prefectural level governments to business establishments with 40 or more workers.

The items collected in the Yearbook are as follows:

Summary
1. Trends in plastic product industry over the past years
   1. General trends
   2. Trends in production by product
2. Raw materials
3. Trends by size of companies

Statistics
1. Indicators
   Plastic product indicators
2. Production, shipment, and inventory statistics
   1. Comprehensive statistical tables
   2. Shipment and inventory statistics by product
      Plastic products (total)
      Film
         Soft film products
         Hard film products
      Sheets
      Plates
      Synthetic leather
      Pipes
      Joints
      Machinery and equipment parts
      Daily necessities and sundry goods
      Containers
      Building materials
      Foam products
      Reinforcement products
      Others
      Bath tubs
   3. Production statistics by prefecture etc.
   4. Sales statistics by prefecture etc.
3. Statistics by size of companies
4. Consumption and inventory statistics for raw material resins
   1. Comprehensive statistical tables
   2. Consumption and inventory statistics by raw material resin
   3. Consumption and inventory statistics by prefecture etc. and by raw material resin
5. Labor management statistics
   1. Number of workers in nation
   2. Number of workers by prefecture etc.

Reference materials
1. Trade statistics
2. Production, shipment, and inventory statistics of raw material resins
3. Figures for production of plastic processing machines
4. Production, shipment, and inventory statistics for PVC pipes, joints, and sheets

Note that apart from this, industrial organizations often prepare statistics based on information supplied by their member companies. For example, the Japan Plastics Industry Association, the Japanese PVC Association, the Japan ABS Resin Industry Association, etc. each prepare and announce statistics regarding production, shipments, demand forecasts, etc.

<Countermeasure 2>
Promotion of industrial organizations and establishment of system of cooperation among related organizations

To ensure the effective activities of the government policy unit and technical training organizations, cooperation would be essential with industrial organizations (clubs, association, cooperatives, etc.) which represent the opinions of private industry and promote cooperation in the industry. Toward this end, government organizations must provide services which serve to promote and strengthen such industrial organizations and give support so as to achieve closer communication and cooperation among the industrial organizations. To realize this, the establishment of periodic meetings between government organizations and related private industrial organizations would be effective.

[Program 2]

Establishment of Plastic Industry Committee (Provisional Name)

To promote exchanges of information and opinions on government promotion measures for the plastic industry, establishment and activities of government training organizations, cooperation in the private industry, etc. and to promote cooperation between the government and private sector or among related private industries, a committee should be established comprised of those related government organizations and related industrial organizations and should hold meetings periodically. This committee is different from joint committee by FTIA and MOI. The purpose of this committee is for promoting practical activities in daily.

The members of such a committee could be as follows:

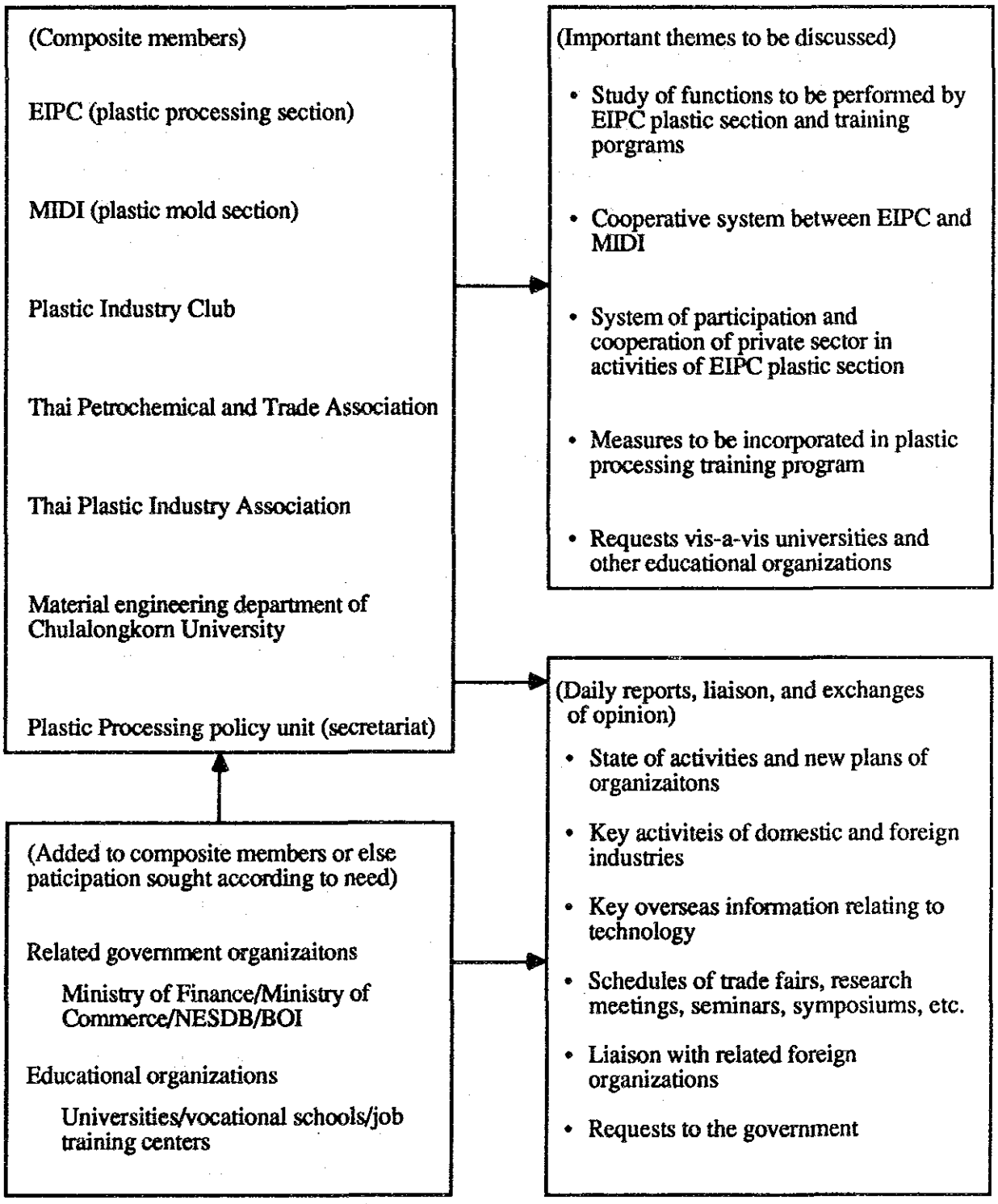
—Plastic policy unit in Ministry of Industry
—EIPC (plastic processing section)
—MIDI (Metal-Working and Machinery Industries Development Institute)
—Plastic Industry Club
—Thai Plastic Industry Association
—Thai Petrochemical and Trade Association
—Universities, educational organizations, etc. with plastic section

In addition, when necessary, consideration should be given to seeking the participation of related sections of the Ministry of Commerce and the Ministry of Science, Technology and Energy.

The secretariat of the committee should desirably be the above mentioned policy unit.

Further, the committee must base its activities on specific themes such as deliberations on the directions of activities in the EIPC plastic processing division, the exchange of opinions with manufacturers of raw materials regarding the supply of materials, and communication with foreign industrial organizations. In particular, regarding the establishment of a training function in the EIPC, it is necessary to solicit in advance the opinions, desires, etc. of industrial organizations, related organizations, etc. and incorporate the same into the plans as much as possible. Therefore, it would be desirable to launch the committee as fast as possible.

Fig. I-2. Roles of Plastic Indsutry Committee



<Countermeasure 3>
Formulation and implementation of incentives for promotion of plastic processing industry

The above-mentioned policy unit would take the lead and, through deliberations with industrial organizations and related government agencies, prepare a comprehensive plan for promotion of the plastic processing industry and mobilize all possible incentives for realization of the same. In particular, for the plastic auto part industry, it is considered necessary to switch over from the old import substitution type promotion measures (of the type which tried to raise the ratio of domestic supply of auto parts assembled in the country) to measures promoting the conversion of the entire auto parts industry to an export orientation.

[Program 3]

Program of promotion of plastic processing industry

This program is envisioned as incorporating the following:

- Flexible use of BOI incentives (in particular for investment in indirect exports and small and medium sized companies)
- Positive use of BOI incentives for promoting plastic mold and die making industry, plastic secondary processing industries (in particular, plating, fixing, special printing, etc.), the specialized compound industry, etc.
- Abatement of import tariffs for plastic processing machinery and molds & dies for plastics.
- Reduction or waiver of import tariffs for special plastic materials
- Positive use of institutional financing (SIFO etc.) for investments of small and medium sized enterprises

Along with the increase in production of plastic industrial parts, demand for special plastics and compounds has been increasing and there has been an increase in the cases where application of the tax abatement or tariff refund measures of the BOI investment incentives is technically difficult. To promote plastic industrial parts as an important sector of the supporting industries, it is considered necessary to devise incentives of a more simpler form, such as sharp reductions of the import tariffs on

plastics.

Regarding plastic auto parts, due to the heavy burden of mold costs etc., there are limits to the approach of raising the local content of domestic cars. Considering the fact that Japanese and U.S. auto markers are moving aggressively to increase their procurement of parts from abroad, rather emphasis should be placed on the promotion of plastic auto parts industries with export competitiveness and to aim at gradually expanding the range of those parts.

Fig. I-3. Promotion Program for the Plastic Processing Industry

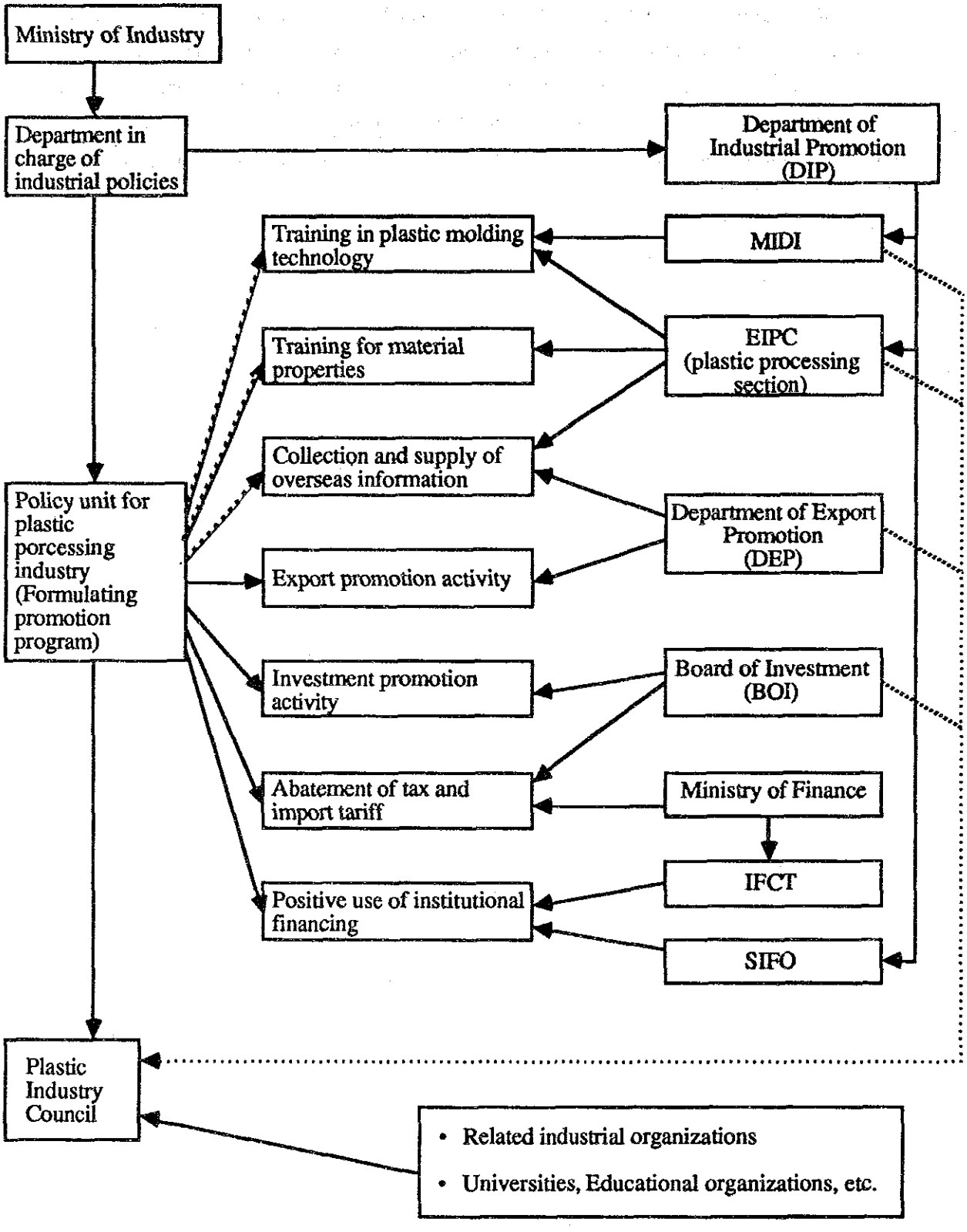
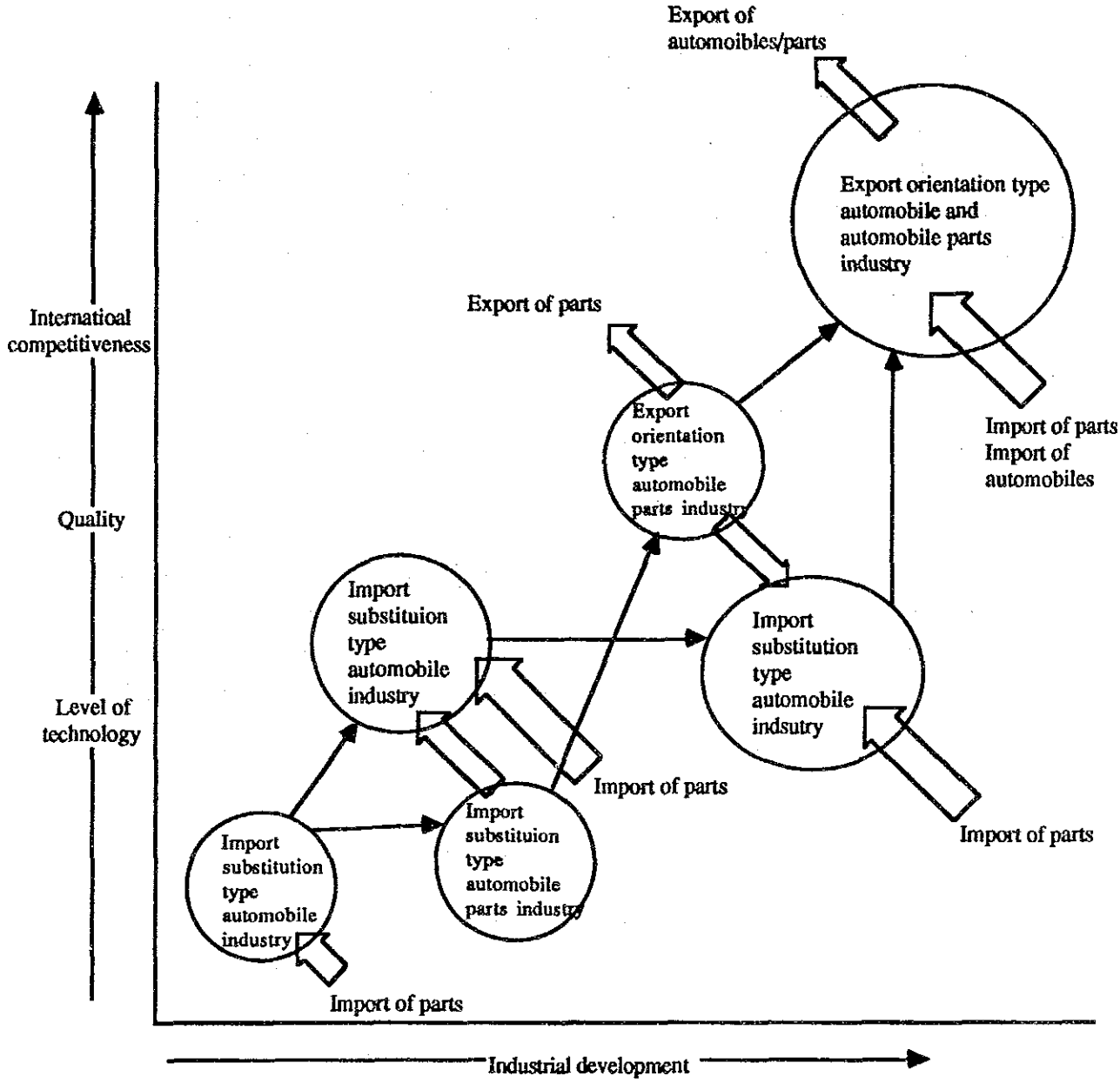


Fig. I-4. Possibility for the Development of the Automobile and Automobile Parts Industry



<Countermeasure 4>
Collection and dissemination of overseas information regarding household plastic goods and promotion of exports

There is enough leeway for increasing exports of tableware, kitchenware, bathroom goods, and other household use plastic products by development of new products, improvement of quality and design, and strengthening of marketing activities. Therefore, it would be effective if the Department of Export Promotion (DEP) of the Ministry of Commerce would work to obtain a grasp of and disseminate overseas market information regarding plastic products and if it would participate in overseas trade fairs, dispatch export missions, support development of export oriented products, and engage in other activities in cooperation with industrial organizations.

[Program 4]

Program of export promotion of household use plastic products by DEP

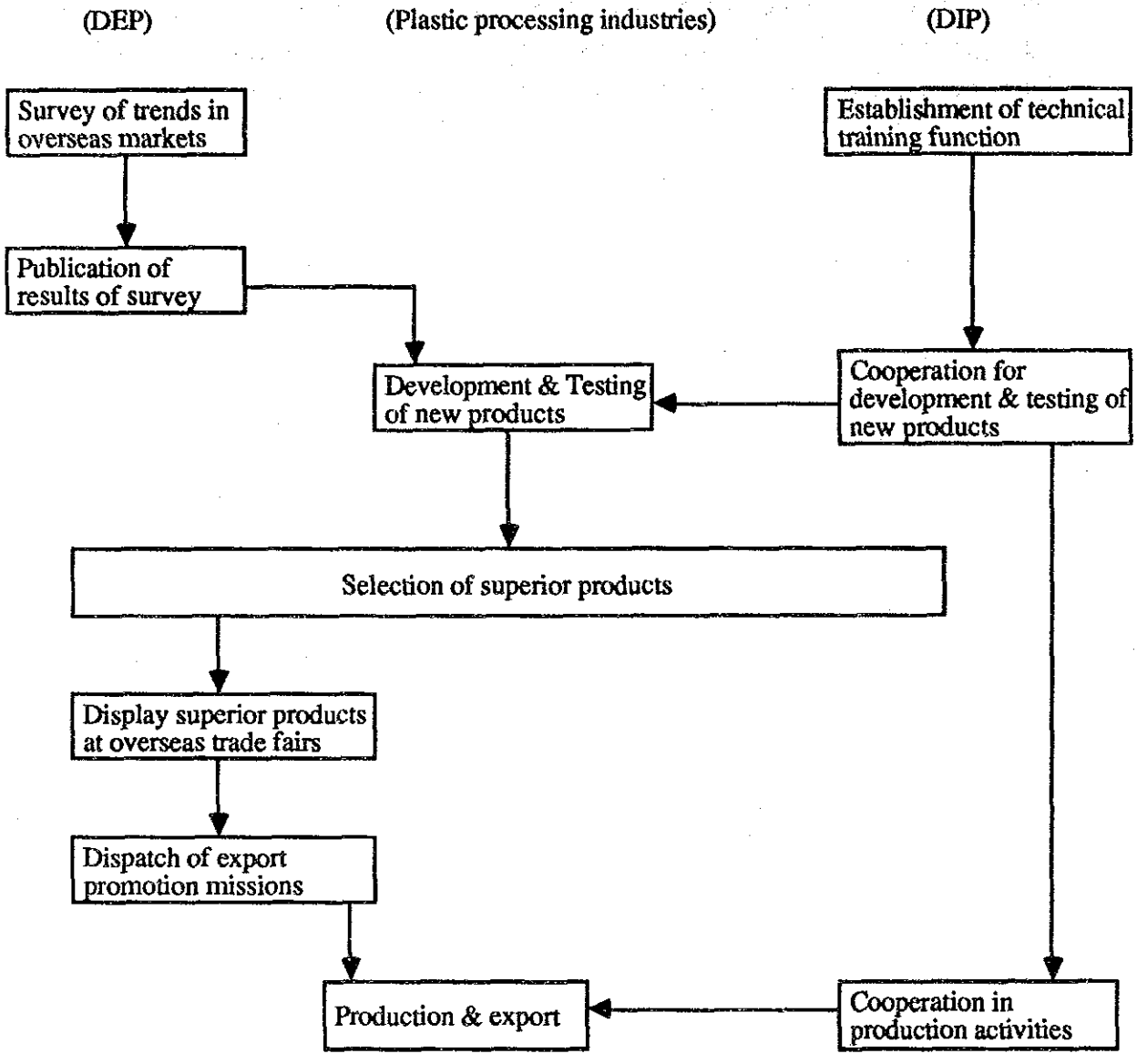
The Department of Export Promotion (DEP) of the Ministry of Commerce would, in cooperation with industrial organizations and the DIP, implement an integrated promotion plan for small and medium sized enterprises covering everything from new product development to market development. The process would be something like the following:

- Survey of trends in key overseas markets for household use plastic goods (including collection of samples and catalogs)
- Disclosure of results of survey to the industry (for example, having same carried in "Plastic" journal issued by TPIA)
- Development by companies of new products in line with trends of the overseas markets
- Display of superior products in overseas trade fairs with the support of the DEP
- Dispatch of export promotion missions with the support of the DEP at the time of the trade fairs

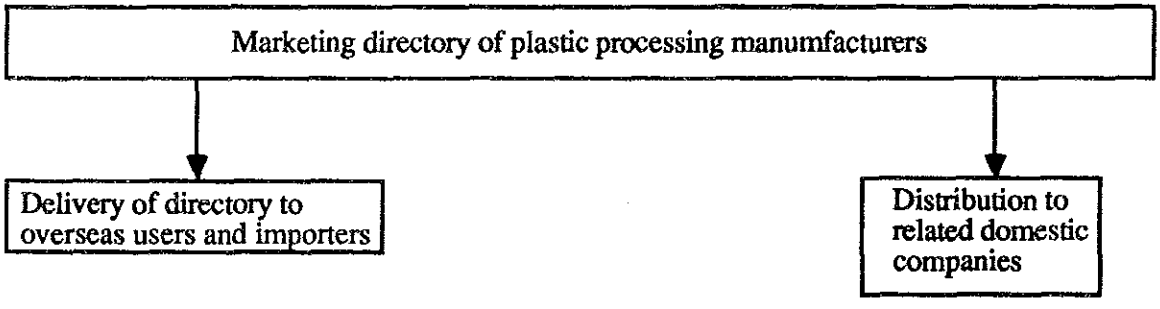
Note that apart from the above, it would be effective to prepare, at least once every two to three years, a directory of processing manufacturers considered able to handle

orders from abroad, subcontracting of production, etc. (preferably including the size of the businesses and other information in addition to the names of the companies, addresses, and production lines), through cooperation of the DEP and DIP, and to distribute the same through the DEP to overseas users and importers and further to send information to these users and importers on the products in trade fairs.

Fig. I-5. Program for Promotion of Exports of Household Plastic Products



(Progressing at the time of the above)



<Countermeasure 5>
Establishment of technical training organization for plastic processing

To promote the development and growth of the Thai plastic processing industry, it is necessary to improve and upgrade the knowledge regarding materials, mold and die making technology, plastic molding technology for various products, etc. for both the field of household goods and daily sundries and the field of industrial parts. In this regard, the establishment of a technical training organization aimed at retraining and reeducation of employees of companies would be very effective in the sense of supporting the efforts of private companies. The plans for establishment of a plastic processing section in the EIPC (Eastern Industrial Promotion Center), which the Ministry of Industry has decided to set up, is considered to be useful in regard to this need.

[Program 5]

Establishment of plastic processing training section in EIPC

The plastic processing training section to be established in the EIPC would preferably have the following functions:

1) Training in plastic molding technology
2) Training in experimental and analysis technology for plastic materials
3) Service for experiments analysis and development of plastic materials on order from plastic goods producers
4) Information center for plastic molding technology and the study of material properties

This information center would accumulate information on plastic-related industry and collect overseas market and technical information in cooperation with the Ministry of Commerce and Ministry of Science, Technology and Energy, etc.

Besides these activities, the center would publish the results of activities by this organization.

Regarding the above-mentioned, functions details are given in the attached paper "The planning of apparatus in the plastic division of EIPC and technical transfer".

Note that in the technical training for plastic molds & dies, the cooperation of MIDI (Metal-Working and Machinery Industry Institute) should be obtained and the maximum use made of its facilities. Further, in the operation of the EPIC plastic processing section, it would be desirable to maintain close cooperation with private industry so as to meet the needs of industry and to introduce as much as possible the principle of the beneficiaries bearing the costs of the services.

Appendix [Detailed Plan of Program 5]

Plan for Equipment of Plastic Division and Plan for Technical Transfer for EIPC

To improve and spread a wide range of molding technology to molding technicians working in the field of plastic molding, researchers, and skilled workers in the processing sector, the following functions will be given to the plastic division of the EIPC (Eastern Industrial Promotion Center).

The main functions would stress the improvement and promotion of the spread of skills in molding, but simultaneously would spread knowledge about techniques for analysis of molding materials, which, while deeply related to the quality of the molded products is very little recognized at the present time, and the significance of corresponding techniques.

Further, among the necessary functions, consideration is being given to including projected needs in research and development of materials which it is judged will inevitably be sought by the industry in the near future along with its acquisition of processing techniques.

Note that the effectiveness of the functions of the plastic division of the EIPC assumes close coordination with private industry and that in their use it is desirable that the principle of the beneficiaries bearing the costs of the services be introduced as much as possible.

1) Function of training in plastic molding technology

-- Techniques of blending main materials and secondary materials
-- Techniques for preventing occurrence of inferior products, burrs, flow marks, etc.
-- Techniques of molding conditions and product quality
-- Skills for operation of molding machines (injection molding, blow molding, extrusion, inflation, etc.)
-- Methods of use of molds (installation, exchange, etc.)
-- Inspection of molded products and techniques of evaluation

Note that it is desirable to consider adding training in printing, painting, plating, adhesion, and other secondary processing techniques (surface

decorative techniques) in the future.

2) Function of training in techniques of testing and analysis of plastic materials

-- Techniques of testing and inspection of raw materials and molded products and of analysis and determination of physical properties

-- Setting of targets for quality of materials

3) Function of training in techniques of adjusting plastic materials

-- Techniques of design and utilization of general use resins and compounds

-- Techniques of development of molded products and evaluation of performance

4) Function of consigned testing, analysis, and research and development of plastic materials

The EIPC plastic division will be organized so as to enable its equipment and the technical knowhow and skills of its training staff to be effectively offered to and made use by private industry in resolution of problems facing it or in implementation of its plans.

Toward this end, the division will be given functions of undertaking of work by the EIPC staff alone and of joint undertaking of work with technicians of private companies. Further, plans call for inclusion of a function enabling facilities to be opened widely to private technicians to enable the facilities to be effectively used by both the public and private sectors.

5) Function of information center relating to processing technology and characteristics of materials

-- Accumulation and use of information

In particular, effort will be made to collect overseas information and spread it widely in the private sector. Consideration will be given to maintaining close coordination with the TIPA and providing information to the industry journal issued by the TIPA or else publishing an independent public journal.

[Facilities Necessary for Various Functions]

1) Training in molding skills

* Training equipment for molding (Table I)
* Training equipment for pretreatment (Table II)

2) Training in techniques of testing and analysis of materials

* Equipment for analysis of materials and composition of molded articles
  - Equipment for rough analysis of materials (Table III-A)
  - Equipment for detailed analysis of materials (Table III-B)
  - Equipment for analysis of additives (Table III-C)
* Equipment for analysis of grade of materials of molded articles (Table III-D)
* Equipment for evaluation of quality and analysis of molded articles (Table III-E)

3) Training in techniques for adjusting materials (Table IV)

4) Service of handling consigned testing, analysis, and research and development of materials (Table I-IV)

[Area of Site Required for Installation of Equipment]

* Training equipment for molding skills and training equipment for skills for adjustment of materials (Tables I, II, and IV) - About 1,200 m^2
* Training equipment for testing and analysis of materials (Table III) - About 4,000 m^2

The required effective area of installation of the above facilities would be about 2,600m^2, including about 100 m^2 for constant temperature rooms, about 250 m^2 for air-conditioned rooms, and 50 to 709 m^2 for testing and pretreatment scientific experimentation rooms. These would require dustproof and vibration-proof constructions.

* In addition, space would be required for stockpiling of resin materials and for display and storage of molded products.

[Technical Transfer Plans]

For the transfer of technology regarding purposes of use of the equipment, usage methods, analysis of data, etc. to the technicians in the EIPC, experts will be dispatched under the schedule shown in Table V. Experts are planned to be dispatched for a total of 78 expert-months. The term will stretch over two years. In the first one year, training will be provided only to EIPC technicians who will be directly involved in the guidance of the private sector and spread of techniques and skills to the same and who will engage in their own research and development in the future, while in the second year technology will be transferred in the form of support given to the EIPC technicians in their provision of services to the private sector (on the job training system).

Plan 5 - (Table I.) Equipment for Molding of Plastic (Two Sets of Equipment Each)

Name of equipment	Main specification	Utilities
Injection molding machine	40 kW, clamping force 100 tons	Mold, mold temp. controller
Same	75 kW, clamping force 330 tons	Same
Blow molding machine	30 kW	Air compressor, 18 liter industrial use
Rotational molding machine	15 kW	
heet casting machine	70 kW, 65 f, 100 kg/H	Vacuum former (40 kW, 400 x 100mm), winder
Monoaxial stretching machine	100 kW, 40 f	Oven, roll, winder
Biaxial stretching machine tester	60 kW, 40 f, Pantagraph	Oven, roll, winder
Air cooled blown film making machine	Surface treatment,	40 kW, 40 f, static remover, winder
Water cooled blown film making machine	45 kW, 40 f,	Surface treatment, static remover, winder
Extrusion laminater	100 kW, 50 f, roll width 500 mm	Hot air dryer, roll, winder

Plan 5 - (Table II.) Equipment for Treatment Before Molding of Plastic

Name of equipment	Main specification	Utilities
Air circulation type dryer	6 kW, volume 100 liters	
Hopper dryer	6 kW	
Blender	V blender, 20 kg/batch	
Grinder	7 kW	

Plan 5 - (Table IV.) Equipment for Adjustment of Plastic Materials

Name of equipment	Main specification	Utilities
Brabender plastograph	12 kW, volume 60 cc	Duct
Twin-roll mixer	20 kW	Duct
Single-screw extruder	40 f, L/D 28	Duct
Twin-screw extruder	60 kW, 44 f, L/D 30	Duct, water tank,cutter
Super-mixer	15 kW, volume 50 liters, batch type	Duct

Plan 5 - (Table III.) Testing and Analysis Equipment for Plastic Materials

	Name of equipment	Room condition		Purpose of use				
		Constant temp.	Air-conditioning	A	B	C	D	E
1)	Infrared spectrophotometer (FT type)		*	*	*	*		
2)	Hot press (small size, each set for heating and cooling)			*			*	
3)	Cold pulverizer			*				
4)	Microtome			*				
5)	Optical microscope		*	*				*
6)	IR-microspectrometer		*	*				
7)	Gas chromatograph with mass detector		*		*	*		
8)	Differential scanning calorimeter		*		*			
9)	Pyrolysis gas chromatograph		*		*	*		
10)	Nuclear magnetic resonance (^{1}H,^{13}C superconducting magnet)		*		*			
11)	Centrifugal separator				*			
12)	High speed liquid chromatograph		*			*		
13)	Ultraviolet spectrophotometer		*			*		
14)	High frequency oven					*		
15)	Scanning electron microscope		*			*		*
16)	Size exclusion chromatograph		*				*	*
17)	Solution viscometer		*				*	*
18)	Density gradient tube	*					*	*
19)	Capillary rheometer		*				*	
20)	Melt indexer						*	
21)	Melt tensionmeter		*				*	
22)	Universal strength tester (autograph etc.)	*					*	
23)	Tearing tester (Elemendorf type)	*					*	
24)	Impact tester	*					*	
	Izot impact tester							
	Charpy impact tester							
	Brittleness temperature tester							
25)	Hardness tester (Rockwell type)	*					*	
26)	Creep tester	*					*	
27)	Heat distortion tester	*					*	
28)	Haze meter	*					*	
29)	Gloss meter	*					*	
30)	Calorimeter	*					*	

31)	Slip tester	*				*	
32)	ESCR tester (Environmental Stress Cracking Resistance)	*				*	
33)	Thermodegradation test					*	
34)	Fadeometer (Fade-o-meter type)					*	
35)	Weatherometer (Weather-o-meter type)					*	
36)	Birefringence tester		*				*
37)	X-ray diffraction tester		*				*
38)	Surface roughness tester		*				*
39)	Moisture meter						*
40)	X-ray detector (energy dispersion type)		*		*		
41)	Thermo-balance		*			*	

Plan 5 (Table V.) Plan for Dispatch of Experts (Example)

General Training Item	Name of Training Equipment	Expert	Schedule of Technical Transfer (Two Years) Jan. Apr. July Oct. Jan. Apr. July Oct.	M/M
Comprehensive coordination of training		Group leader		24
Analysis and physical analysis 1. Analysis of plastic products on market (a) Judgement of rough types of plastics	1) Infrared spectrophotometer 2) Hot press 3) Cold pulverizer 4) Microtome 5) Optical microscope 6) IR-microspectrometer	A		6
(b) Judgement of detailed types of plastics	7) Gas chromatograph 8) Differential scanning calorimeter 9) Pyrolysis gas chromatograph	B		6
	10) Nuclear magnetic resonance apparatus 11) Centrifugal separator Other necessary equipment 1)	C		9
(c) Analysis of additives mixed in	12) High speed liquid chromatograph 13) Ultraviolet spectrophotometer 14) High frequency oven	B		—
	15) Scanning electron microscope 40) X-ray detector Other necessary equipment 1) 7) 9)	D		9
2. Judgement of grade of polymers (a) Determination of molecular weight and distribution of molecular weight (b) Evaluation of crystallinity	16) Size exclusion chromatograph 17) Solution viscometer 20) MI 18) Density gradient tube	E		6

General Training Item	Name of Training Equipment	Expert	Schedule of Technical Transfer (Two Years) Jan. Apr. July Oct. Jan. Apr. July Oct.	M/M
(c) Evaluation of physical properties of solution	19) Capillary rheometer 21) Melt tensionmeter Other necessary equipment 20)	E		—
(d) Evaluation of quality Mechanical properties Thermal properties Optical properties Frictional properties Chemical resistance	22) Universal strength tester (autograph) 23) Tearing tester (Elemendorf type) 24) Impact tester (Izot, Charpy, etc.) 25) Hardness tester (Rockwell type) 26) Creep tester 27) Heat distortion tester 41) Thermo-balance 28) Haze meter 29) Gloss meter 30) Calorimeter 31) Slip tester 32) ESCR tester 33) Thermodegradation test 34) Fadeometer 35) Weatherometer Other necessary equipment 2)	F		6
3. Analysis of molding conditions and quality of molded articles	36) Birefringence tester 37) X-ray diffraction tester 38) Surface roughness tester 39) Moisture meter Other necessary equipment 15) 16)	F		—
Working training 1. Operation of molding machines	Injection molding machine Blow molding machine Rotational molding machine	G		6

General Training Item	Name of Training Equipment	Expert	Schedule of Technical Transfer (Two Years) Jan. Apr. July Oct. Jan. Apr. July Oct.	M/M
	Sheet casting machine Monoaxial stretching machine Biaxial stretching machine Air cooled blown film making machine Water cooled blown film making machine Extrusion laminater	H		6
2. Preparation of raw materials	Dryer Hopper dryer Blender Grinder	H		—
Preparation of materials 3. Operation of compounding machines	Brabender plastograph Twin-roll mixer Single-screw extruder Twin-screw extruder Super-mixer	G		—

Note: The above mentioned Plan for Dispatch of Experts is an example as stage of planning.
In case of engagements in practical, the number of experts and the way of dispatch should be studied according to the condition.

(Reference for Program-5)

Operational Plan for EIPC Plastic Division

The operation of the EIPC plastic division up until the transfer of technology to the technicians of the EIPC plastic division and the start of services by those technicians to the private sector is roughly planned to be as follows. The transfer of technology to the technicians of the EIPC and the education and training of private sector technicians will cover both scientific theory and practical skills.

[Preparation of Services and Persons Covered]

1) Education and training in technology for molding plastics and for adjusting materials

2) Education and training in technology for testing and analyzing plastic materials

First fiscal year...	Transfer of technology to technicians in charge in EIPC plastic division and to all supplementary personnel by overseas experts
Second fiscal year...	Division of EIPC technicians into fields of expertise 1) and 2) for educating and training private sector technicians. The overseas experts will provide assistance in the practical activities of EIPC technicians so as to ensure complete transfer of technology.
Third fiscal year on...	The EIPC technicians and supplementary personnel will commence full scale activities on their own. Suitable persons will be dispatched overseas or overseas experts will be engaged, as needed, to continue to maintain and improve the facilities and technical skills.

3) Testing, analysis, and research and development of plastic materials on commission

Work will be performed, primarily by the technicians and the supplementary personnel of the above section 2), on commission from the private sector. The commissioned work will begin from the second fiscal year, with guidance from overseas experts for the first year after the start. Further, private sector technicians will

be used in accordance with the nature of the commission.

4) Information activities on processing technology and characteristics of materials

A group of specialists will be selected from the technicians to collect information and disseminate it to industry from the second fiscal year. Guidance will be received from the overseas experts for the first year after the start of this work.

[Plan for Technical Transfer and Education and Training]

A total of nine overseas experts will be designated. The number of experts in each technical field is shown in parentheses.

1) Scientific Theory

[1] Methods of chemical analysis of polymers, methods of mechanical analysis of polymers, polymer physics (three overseas experts)
[2] Chemistry of additives and methods of analysis of additives (one overseas expert)
[3] Polymer (solid, molten, and solution) physics (one overseas expert)
[4] Resin materials in general (one overseas expert)
[5] Molding theory (injection, extrusion, blowing, etc.) and basics of molds (one overseas expert)
[6] Construction, maintenance, and safe operation of molding machines (one overseas expert)

2) Practical Skills

For details on the contents, see Plan 5 (Table V).

[1] Material analysis and analysis of physical properties
- Analysis of materials of plastic products (four overseas experts)
- Judgement of grade of polymers (two overseas experts)
- Analysis of molding conditions and quality of molded articles (one overseas expert)

[2] Molding and blending of materials (two overseas experts)

[Education and Training Course]

1) Education and training in technology for molding of plastics and adjustment of materials

- Worker training course (enrollment: 50 persons, six months' duration, two times a year)

  This course will be directed at persons with at least technical vocational school degrees with no practical experience and will give them practice in operation of processing facilities and knowledge on basic processing theory.

- Retraining course (enrollment: 30 persons, three months' duration, two times a year)

  This course will be directed at technicians with at least technical vocational school degrees with at least five years practical experience and will give them knowledge of advanced processing technology based on theory.

2) Education and training in testing and analysis technology of plastic materials

- Testing and analysis course (enrollment: 10 persons, six month's durtion, two times a year)

  This course will be directed at technicians with at least two-year college degrees who have at least five years of practical experience in plastic processing manufacturers or material processing manufacturers and will give them knowledge of applied technology relating to the testing and analysis of materials and material processing.

Certificates will be given in each of the courses to persons completing the training.

[Plan of Staff]

		1st fiscal year	2nd fiscal year		3rd fiscal year on	
		12 months	1st half	2nd half	1st half	2nd half
Overseas experts		9	9		—	
E I P	Processing and adjustment technicians	13	6		6	
	Testing and analysis technicians		7 (4)		7 (4)	
C	Supplementary personnel (technical)	10	10		10	
Worker training course		—	50	50	50	50
Retraining course		—	30	30	30	30
Testing and analysis course		—	10	10	10	10

- Figures show number of personnel.
- Figures in parentheses show number of personnel performing work on commission.

[Budget and Expenses]

1) Expenses for purchase of equipment (price of procurement in Japan)
- Molding facilities:Shown in plan 5 (Table I) ¥830 million
- Premolding treatment facilities: Shown in plan 5 (Table (II) ¥7 million
- Material testing and analysis facilities: Shown in plan 5 (Table III) ¥352 million
- Facilities for adjustment of materials: Shown in plan 5 (Table IV) ¥90 million

2) Maintenance expenses (yearly amount)
- Expenses for repair of equipment
  (parts, lubricating oil, calibration of meters, molds, etc.) ¥7 million
- Consumables (reagents, recording paper, N2 gas, tools, etc.) ¥4 million
- Educational materials (resin, solvent, dyes, molds, etc.) ¥12 million

3) Training expenses
- Borne by individuals
- Borne by companies

4) Expenses for commissioned testing and analysis and joint development
To be borne by beneficiaries based on provisions of EIPC (actual costs)

1-3. Study of Priority Order of Programs

The Thai plastic processing industry has reached a certain level of development and private sector activity is busy, so these programs aim at supporting the vitality of private companies by government authorities and promotion of the industry under cooperation with the private sector.

The priority order of the programs is as shown in Table 1-3. The priority order was given based on the relative ease of implementation without a large monetary burden.

In implementing the individual programs, the following would be desirable:

1) Establishment of Policy Unit for Plastic Processing Industry

To clarify the responsibility over the plastic processing industry, it would be desirable to establish a policy unit for implementation of policies before establishing any programs.

2) Establishment of Plastic Industry Committee

The policy unit must immediately organize such a council so as to enable an exchange of information and opinions between private companies and related government authorities and further to implement usual promotion measures.

3) Program for Promotion of Plastics

The plastic processing industry is heavily comprised of small and medium sized enterprises and includes large numbers of companies too, so it is considered necessary to implement a program (countermeasures and policies) for strengthening the overall foundation of the processing industry which would enable all the companies to equally share in the benefits and could be expected to be effective. The policy unit to be established should take positive charge over negotiations with related government organizations for implementation of the program.

4) Export Promotion Program for Plastic Household Goods by DEP

The export promotion activities of the DEP are well known in the industry. In

promoting the exports of plastic products, it would be desirable to promote exports in a planned fashion in the overall export promotion activities and in cooperation with industry.

5) Establishment of Plastic Training Division in EIPC

The training of technicians and skilled workers is an important task of government affiliated organizations. The Ministry of Industry should perform its designated tasks while maintaining contact with the affiliated organizations. The technology required for the plastic processing industry covers diverse areas and is numerous in type. Progress of that technology, further, is fast. The training division of the EIPC should monitor these trends and adapt its operations to meet the needs of the times.

Table I-3. Study of Priority Order of Programs (Plastic Processing Industry)

Program	(1) Establishment of policy unit for plastic processing industry	(2) Establishment of Plastic Industry Council	(3) Program for promotion of plastic processing industry	(4) Program for promotion of exports of household plastic goods by DEP	(5) Establishment of plastic training division in EIPC
Existence of public promotion organization	—	No	No	Yes	No
Necessity of augmentation or new establishment of the above	New establishment	New establishment	New establishment	—	New establishment
Magnitude of required funds	—	—	—	—	Large
Possibility of securing required personnel	Possible in Thailand	Possible in Thailand	Possible in Thailand	Possible in Thailand	High
Magnitude of direct effects	Large	Large	Large	Large from long term perspective	Absolutely necessary in future
Urgency of implementation of program	1	2	3	4	5
Necessity of external support	Small	Small	Small	Small	Large
Possibility of realization of the above	Possible	Possible	Possible	Possible	Possible

Notes: (1), (2), (3), and (4) are policy matters and are possible without construction of new facilities.
(2), (3), and (4) are shown as requiring little external support. This means that related organizations will provide advice and necessary information according to need.

Chapter 2. Proposal of Comprehensive Programs for Ceramic Industry

2-1. Main Problems

(1) The Thai ceramic industry has been developing as an export industry, but there are major differences in knowledge and experience depending on the region, such as Bangkok, Chiang Mai, and Lampang and depending on the companies in the supply of raw materials, processing technology, design, management, export marketing, etc. In general, there are many points which require improvement in companies in Lampang. The Ministry of Industry, in particular, must cooperate with other government organizations, research organizations, etc. to formulate comprehensive promotion measures and implement the same.

(2) The first problem is the instability of the quality of the clay, a domestic raw material. This is a major factor obstructing the improvement of the quality of ceramic products. Therefore, in mining and supplying clay, it is urgent to establish a system which could supply stable quality clay through a check and grading of the clay quality.

The problems in processing technology, design, marketing, etc. are largely due to a lack of information.

(3) From these viewpoints, it is expected that the government's plan to establish a Ceramic Center in Lampang will play an important role in the promotion of the ceramic industry.

This Ceramic Center has to be established and operated with the full cooperation of the local ceramic industries, in particular the Lampang Ceramic Association. As a function, it would be effective to give the center a training function dealing with problems in the supply of stable quality clay mentioned above and further the production process from the processing of the raw materials to the firing. Also, an important function would be to collect and offer for use by the industry technical information relating to ceramics and market information.

(4) The promotion measures for the ceramic industry would desirably for formulated to deal with not only the series of problems mentioned above, but also to include reductions of the import tariffs on machinery related to the manufacture of ceramic products, improvements in the institutional financial schemes such as the SIFO, abolition

of import bans on tableware, etc. In particular, reduction of the import tariffs on machinery would help promote the spread of imported kilns with high fuel efficiencies and leading to stable product quality and, considering this alone, would be tremendous in effect.

(5) For the improvement of technology, modernization of management, and promotion of exports in the ceramic industry as a whole, an important topic will be to encourage a revolution in thinking in the management of small and medium sized enterprises. For this, it would be effect to provide information relating to management, technology, markets, etc. and to hold seminars.

Further, to promote ceramics as an important export industry, it is necessary to work to collect and disseminate foreign designs and market information and to strengthen support for participation in foreign trade fairs aimed at small and medium sized enterprises and dispatch of export missions.

Table I-4. Comprehensive Programs (Ceramic Industry)

Package of measures	Programs	Method of implementation and schedule of implementation				
		Method	1st stage	2nd stage	3rd stage	
Drafting of policy regarding ceramic industry and new establishment of function for promotion of same	Establishment of policy unit for ceramic industry		o			
	• Exchanges of opinion, coordination, and cooperation with ceramic related private organizations and research organizations (universities)	Periodic convening of conference		o		(Continuous task)
	• Exchanges of information and opinions and coordination of policies with other ministries	Coordination of policies regarding supply of raw materials, training of personnel, investment promotion, etc.		o		(Continuous task)
	• Collection and dissemination of related information (furnishing of basic statistics, collection of information on raw materials, etc.)	Accumulation of basic data and related information and announcement of results periodically		o		(Continuous task)
	• Support and guidance of technical research organizations	Preparation of regulations, supervision and guidance, preparation of reports on results, announcement of same		o		(Continuous task)
	• Preparation and implementation of promotion measures	Implementation of recommendations		o		(Continuous task)
Establishment of technical training organization regarding ceramic manufacture	Establishment of Lampang Ceramic Center			o		
	• Analysis and grading of raw materials (Lampang clay)	Implemented in cooperation with research organizations and private organizations	o			
	• Training in ceramic manufacturing technology	Training and seminars in accordance with needs of industry in raw material processing, molding, etc.		o		
	• Research and development	Research and training on product development, design, etc.			o	
	• Other training	Seminars regarding modernization of management, improvement of productivity, etc.			o	
	• Technical and information services	Collection and dissemination of technical information		o		

Package of measures	Programs	Method of implementation and schedule of implementation			
		Method	1st stage	2nd stage	3rd stage
Checking and grading of raw materials and stabilization of quality	Preparation of analysis and grading system for raw materials at NIPC	Transfer of functions simultaneously with establishment of Lampang Ceramic Center	o		
	• Engagement of foreign experts	Seminars, OJT, etc.	o		
	• Grading by cooperation with raw material suppliers	Deliberations with industrial organizations, raw material producers, etc.		o	
	• Establishment of raw material processors	Periodic conferences with industry			o
Activities for promotion of exports of ceramics and for raising awareness of production areas	Campaign for promotion of ceramic industry	Cooperation with DEP			
	• Marketing activities covering key overseas markets	Obtaining grasp of market trends and provision of information to industry	o		
		Selection of promising products and participation in trade fairs		o	
		Dispatch of export promotion missions		o	
		Promotion of buyers missions from abroad		o	
	• Sponsoring of Lampang/Chiengmai Ceramic Festival	Superior design contest, exhibition and sales, etc. (in cooperation with industrial organizations)	o		
Mobilization of incentives for promoting ceramic industry	Program for special promotion of ceramic industry				
	• Reduction of import tariffs	Cooperation with MOF		o	
	• Exception application of investment incentive system	Cooperation with BOI		o	
	• Positive use of institutional financing	SIFO		o	

2-2. Countermeasures and Programs

<Countermeasure 1>
Establishment of function of proposing and promoting policies relating to ceramic industry

The Thai ceramic industry (tableware and kitchenware and novelties) is comprised of a few large corporations primarily engaged in exports and large numbers of small and medium sized enterprises which supply traditional goods for domestic demand and which are old fashioned in many areas. It will be extremely important to modernize these small and medium sized companies and increase their exports, in the sense of promoting regional dispersion of industry too. From this viewpoint, proposal and realization of sectorial industrial policies for the ceramic industry are important for the Ministry of Industry and establishment of a policy unit in the same to take charge of their promotion is considered essential.

[Program 1]

Establishment of policy unit for ceramic industry

This unit would be established as part of the government section in charge of industrial policies and would perform the following tasks:

•Exchange of opinions, coordination, and cooperation with ceramic related private organizations and research organizations (universities, etc.)

— Periodic liaison conferences (for hearing desires of private companies, demands for cooperation in policies by government, research, seminars, etc.)

(For the time being, the important work will be the establishment of the Lampang Ceramic Center mentioned in Program 2 and the establishment of raw material analysis and grading function mentioned in Program 3.)

•Exchange of information and opinion, coordination of policies, etc. with other ministries

— With the Ministry of Commerce (exchanges of market information), the Ministry of Finance (import tariff problems regarding raw materials and machinery), Ministry of Interior (Department of Labor = direction of

training of skilled labor), Ministry of Science, Technology and Energy (clarification of division of duties), BOI (promotion of subcontractors)

•Collection and dissemination of related information

— Establishment of function for collection of basic statistics and for collection and dissemination of information on materials and on technology

•Supervision, and guidance of training, research and development organizations

— Preparation of regulations of training and research organizations, (duty of public disclosure of results of research, types and ranges of services handled, etc.), and supervision based on those regulations

•Preparation and implementation of incentives

—Implementation of recommendations of report

Study of future problems (energy saving, etc.)

Note that, even regarding the establishment of the Lampang Ceramic Center mentioned in Program 2 and the establishment of a raw material analysis and grading function mentioned in Program 3, at the preparatory stage, it will be necessary to exchange opinions and coordinate with private industry, related organizations, etc. and to engage in activities for the realization of these projects. The role of the policy unit (in Bangkok) as the central organizer for all this is considered essential. Therefore, it is preferable to establish the policy unit as quickly as possible.

The quality of ceramic products is largely governed by the quality of the materials, so the government, which decides upon the system for supply of raw materials, would find it extremely important to grant concessions. The policy unit must fully recognize this point and strive to coordinate among the government organizations having jurisdiction over mine development.

Table 1-5. Reference: Statistics on Ceramic Products

In formulating and realizing sectorial industrial policies, it is important to obtain a grasp of the related statistical data.

In the Ministry of International Trade and Industry of Japan, the following main types of statistics are being prepared relating to ceramic products:

1. The following data is prepared for ceramic products (tableware, novelties, tile, sanitary porcelain, etc.) using "general merchandise statistics" :

(1) Production indexes

(2) Production, shipment, and inventory statistics

Volume of production, volume and value of sales (domestic and export), volume of inventories

2. The following data is prepared for materials using "resource statistics":

Production, reserves, and imports (exports) of main materials

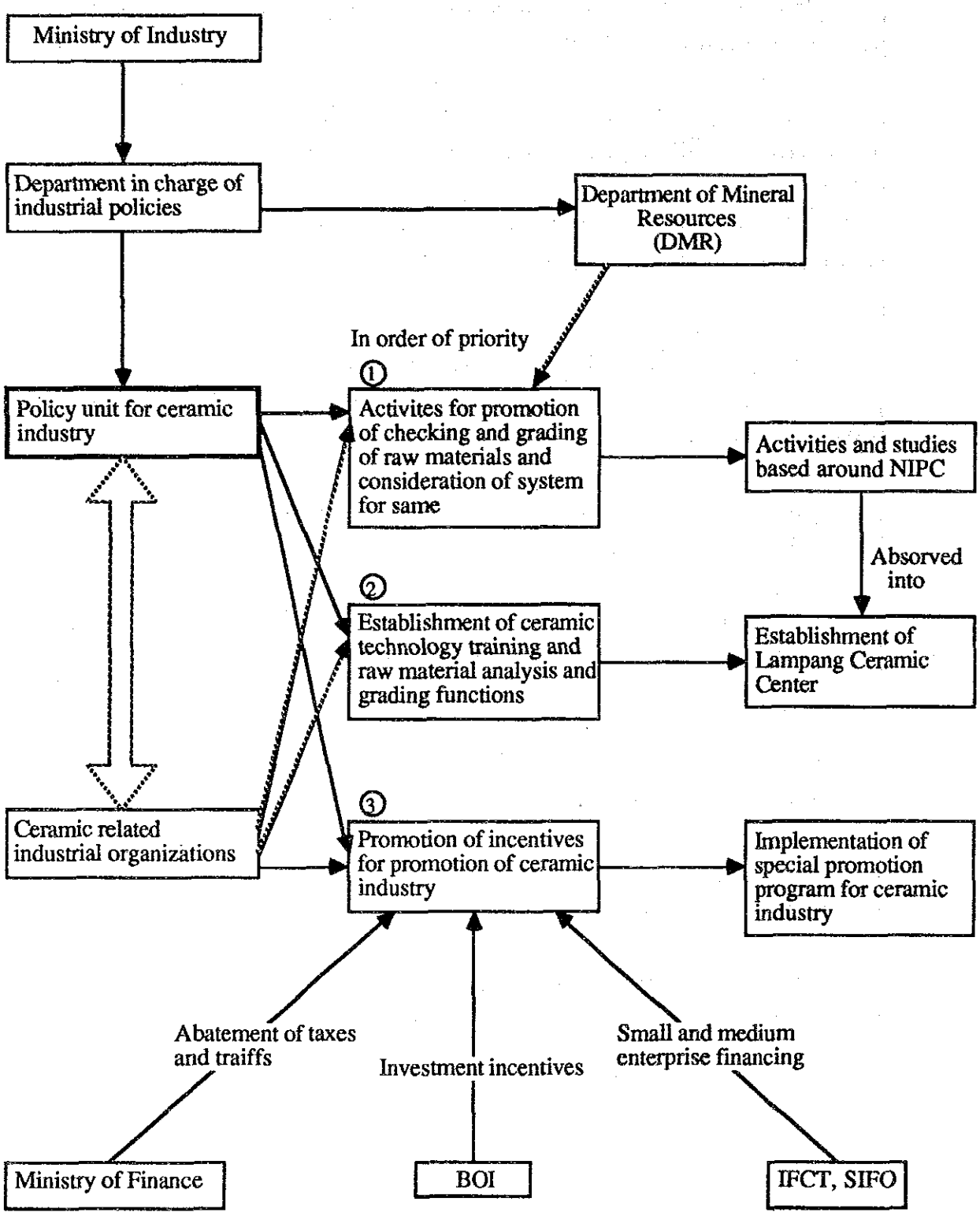
3. Statistics broken down into numbers of employees for places of business with four or more employees are prepared to show trends in manufacturing plants using the "census of manufacturers" and the following are clarified:

Number of employees, number of business places, value of materials used, value of products shipped, value of production, etc.

The data is prepared, for ceramic products, for tableware, novelties, tile, sanitary porcelain and other sectors.

In addition to the above, industrial organizations obtain data from their member companies and prepare production, shipment (export) and other related statistics.

Fig. I-6. Duties of Policy Unit for the Ceramic Industry



<Countermeasure 2>
Establishment of technical training institute for manufacture of ceramics

To convert the many small and medium sized enterprises from an orientation toward domestic demand to one of exports, technology and skills must be upgraded throughout the production process, from processing of materials to molding, firing, and product inspection. For this, it is considered effective to establish a technical training institute for the retraining of the technical staff of companies. The Ceramic Center, which the Ministry of Industry has already decided to establish in Lampang to the North, should be extremely significant in this regard and also from the viewpoint of regional dispersion of industry.

[Program 2]

Establishment of Lampang Ceramic Center

The following are envisioned as the training functions to be established in the Ceramic Center:

• Analysis and grading of raw stone

Establishment of facilities required for analysis and grading of quality of ceramic materials and especially "Lampang Clay" and provision of analysis and grading services for new raw material supply system studied in Program 3.

•Training in ceramic making technology

- Processing of raw materials
- Molding (in particular tableware and kitchenware and novelties)
- Decoration
- Firing (shuttle kilns, tunnel kilns)
- Production control
- Quality inspection of products

•Others

- Training in product development and design
- Production of glazes and sales at cost (cooperation in joint purchases by industrial organizations)

•Other training

— Seminars on modernization of management, improvement of productivity, export marketing, etc.

•Technical and information services

— Collection and dissemination of overseas market information and technical information (obtaining cooperation of DEP of Ministry of Commerce)

— Exhibition and wholesaling of products of companies

Note that, in the operation of the Ceramic Center, it is necessary to maintain close cooperative relations with the local ceramic industry, in particular, the industrial organizations, and to serve industry needs. Further, as much as possible, the principle of the beneficiaries bearing the cost of the services should be adopted so as to ensure a certain amount of income and allow improvement of the Center's own machinery and services.

Further, the Ceramic Center should be envisioned as offering technical and information services for the entire Thai ceramic industry in the future, although for the time being it will engage in activities mainly directed to the ceramic industry in the northern part of the country.

Appendix. [Detailed Plan of Program 2]

Establishment of Ceramic Center

1. Object

(1) Development, refining, and use of ceramic raw materials produced in northern region
(2) Raising of technical level of ceramic industry, establishment of manufacturing technology, and establishment of quality control technology
(3) Training of skilled workers by education and training
(4) Training of expert technical supervisors
(5) Development and application of new products
(6) Promotion of Thai ceramic industry
(7) Roving technical guidance to private companies

2. Details of Activities

2.1. Training

The following will be performed with the aim of training expert technicians, retraining officers of private companies, and training skilled workers:

(1) Basic training
- Training for acquiring basic knowledge regarding the ceramic industry as a whole and production technology

(2) Training of expert technicians
- Training of experts in testing of raw materials, body and glaze making, forming, firing, and other production technologies.

(3) Retraining of private officers
- Concentrated retraining of private company officers, educational personnel, and work foremen
- Training by various training courses and sponsoring of seminars

2.2. Research and Development

The following will be performed with the aim of the development of raw materials, research into new products, and improvements in and development of production facilities:

(1) Research and use of raw materials
- Surveys and sampling for development of various ceramic raw materials
- Chemical and physical analyses for establishment of criteria for selection of usable materials and methods of use

(2) Technical research
- Improvements and development of manufacturing technology for ceramic tableware and related products
- Development and research of production facilities

(3) Product research
- Improvements of quality and making of prototypes of new products, new fields, research and development
- Studies of existing products and checks for improvement of quality

2.3. Technical Information Services

Opening up of technical materials to private companies, educational organizations, etc., exhibitions, technical consultations, and roving technical guidance will be performed.

(1) Opening up to public of specialized ceramic books and technical literature
(2) Exhibition of important products of Thailand and other countries
(3) Promotion of ceramic industry
(4) Roving technical guidance and consultations of private companies
(5) Supply of information relating to promotion of overseas exports

3. Details of Facilities

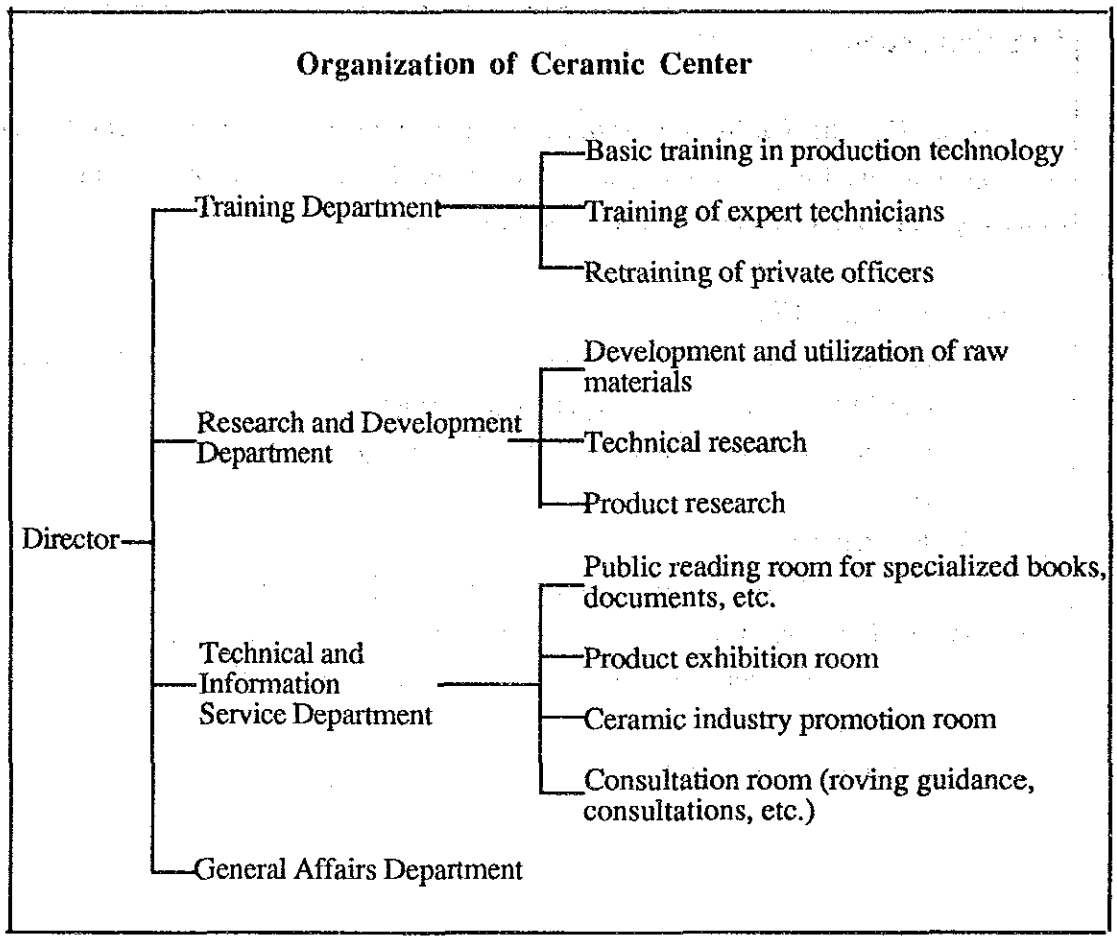
Basically, the facilities introduced will be aimed at testing, research, and development and for job training designed to enable acquisition of manufacturing technology and improvement of the level of technology.

(1) Testing and Research

- Facilities for quick and functional analysis and study of raw materials and to facilitate moving on to and applying next stage
- Facilities aimed at testing and research, development of new products, and research

(2) Job training

- Acquisition of manufacturing technology (selection of raw of materials, compounding, forming, firing, decoration, preparation of body and glaze, etc.)
- Handling of equipment and methods of operation (in particular firing facilities and method of operation)
- Refining of raw materials etc.


Organization of Ceramic Center
Director
Training Department
Basic training in production technology
Training of expert technicians
Retraining of private officers
Research and Development Department
Development and utilization of raw materials
Technical research
Product research
Technical and Information Service Department
Public reading room for specialized books, documents, etc.
Product exhibition room
Ceramic industry promotion room
Consultation room (roving guidance, consultations, etc.)
General Affairs Department

List of Tools Necessary for Ceramic Center

[i] Testing and Research

(A) Equipment of Testing

A-1	Bending Strength Tester for Room Temperature	1 set
A-2	Colorimeter	1 set
A-3	Refractoriness Tester	1 set
A-4	Electric Kiln for Thermal Shock Resistant Check	1 set
A-5	Pressing Machine for Test Piece Making	1 set
A-6	*Compressive Strength Tester*	1 set
A-7	Hardness Tester	2 sets
A-8	Portable Thermo-Couple	1 set
A-9	PH-Meter	1 set
A-10	Optical Pyrometer	1 set
A-11	Viscosity Meter	1 set
A-12	O2 Analyzer	1 set

(B) Equipment of Research and Development

B-1	Automatic Particle Size Analyzer	1 set
B-2	Diamond Cutting Machine	1 set
B-3	Electric Kiln (1,500°C and 1,700°C)	1 set
B-4	High Temperature Gas Kiln (Fax. 1800°C)	1 set
B-5	Constant Temperature Dryer	1 set
B-6	Standard Sieve Set with Vibrator	1 set
B-7	Automatic Motor Grinder	5 sets
B-8	Pot Mill Set	2 sets
B-9	Electric Balance	3 sets
B-10	Electronic Precision Balance	1 set
B-11	X-Ray Fluorescence Spectrometer	1 set
B-12	X-Ray Diffractometer	1 set
B-13	TG-DTA Analyzer, TMA	1 set

[ii] Job Training

(A) Body and Glaze Preparation Section

A-1	Ball Mill 1,000 kg	2 sets
A-2	Ball Mill 100 kg	2 sets
A-3	Ball Mill 50 kg	1 set

A-4	Magnetic Ferro-filter	2 sets
A-5	Vibration Sieve	2 sets
A-6	Agitator for Body	2 sets
A-7	Agitator for Glaze	1 set
A-8	Portable Agitator	2 sets
A-9	Slip Pump	1 set
A-10	Filter Press with Diaphragm Pump	1 set
A-11	Hydraulic Pump Unit	1 set
A-12	De-airing Auger Machine	1 set
A-13	Weighing Balance (1,000 kg)	1 set
A-14	Hoist Elevator	1 set
(B) Forming and Drying		
B-1	Automatic Clay Cutter	2 sets
B-2	Roller Head Jigger Machine	2 sets
B-3	Vacuum Casting Slip Tank	1 set
B-4	Electrical jigger Wheels	10 sets
B-5	Mechanical Jigger	5 sets
B-6	Finishing Jigger	2 sets
B-7	High Speed Agitator with Tank	1 set
B-8	Air Compressor	1 set
B-9	Chamber Dryer	1 set
B-10	Slip Rotor	2 sets
B-11	Hot Air Generator	1 set
(C) Glazing		
C-1	Dust Cleaning Machine	1 set
C-2	De-glazing Machine	2 sets
C-3	Belt Conveyor	2 sets
C-4	Portable Agitator	2 sets
C-5	Dust Collector	1 set
(D) Firing		
D-1	Biscuit Firing Shuttle Kiln (1.5 M3)	1 set
D-2	Glost Firing Shuttle Kiln (2 M3)	1 set
D-3	Decoration Electric Kiln (1 M3)	1 set

(E) Decoration		
E-1	Polishing Machine	2 sets
E-2	Automatic Centering Machine	2 sets
E-3	Stamping Pad	2 sets
E-4	Potter Wheel	5 sets
E-5	Mortal and Pestle	6 sets
E-6	Automatic Motor Grinder	3 sets
E-7	Belt Conveyer	1 set
(F) Gypsum Mold Making		
F-1	Vacuum Agitator	1 set
F-2	Original Mold Jigger	1 set
F-3	Finishing Jigger	1 set
F-4	Potter Wheel	6 sets
(G) Clay Washing		
G-1	Disintegrating Agitator	1 set
G-3	Filter Press with Diaphragn Pump	1 set
G-4	Grinding Mill	1 set
G-5	Slip Pump	1 set
G-6	Vibration Sieve	1 set
G-7	Agitator	1 set
(H) Maintenance Workshop Equipment		
H-1	Table Grinder	1 set
H-2	Portable Grinder	1 set
H-3	Disk Grinder	1 set
H-4	Portable Drill	2 sets
H-5	Mechanical Tools	1 lot
H-6	Electric Tools	1 lot
H-7	Electrical Circular Saw	1 lot
H-8	Carpenter Tools	1 lot
H-9	Standard Bit	1 lot
H-10	Electric Arc Welder Set	1 set
H-11	Gas Cutting Torch Set	1 set
(I) Sewage Disposal Equipment		
	Sedimentation tank:. concrete-made, 5mL x 5mW x 2mD	2 units
[iii] Spare Parts		1 lot

Reference: Operational Plan for Ceramic Center

1. Content of Training

(1) Basic course

Object: Acquisition of basic knowledge primarily on manufacture and quality
Coverage: All related parties in ceramic industry
Subjects: Materials, manufacture, quality control, etc.

(2) Expert technician training course

Object: Acquisition of expert knowledge on manufacture and quality and improvement of level of technology
Coverage: Engineers involved in ceramic production and group leader class
Subjects: The training will be comprised of scientific theory and practical skills.

Scientific theory: General theory of refractories, refractory materials, methods of refining and testing materials, production facilities, testing equipment, manufacturing processes, design, gypsum mold making, quality control, process control, etc.

Practical skills: Refinement of materials, preparation of body, preparation of glaze, molding, drying, firing, glazing, decoration, gypsum mold making, testing of materials, testing of products, etc.

(3) Private manager retraining course

Object: Acquisition of systemized knowledge relating to technology and business management from a long-term perspective
Coverage: Managers of companies relating to ceramic industry
Subjects

Product development: Basics of product development, product design, development procedures, etc.

Manufacturing methods: Refinement of materials, preparation of body, preparation of glaze, molding, drying, firing, glazing, decoration, gypsum mold making, etc.

Testing: Testing of materials, products, etc.

Production control: Quality control, process control, inventory control, prime cost control, etc.

(4) Skilled worker training course

Object: Raising of level of skill in specific sectors
Coverage: Workers in ceramic manufacturers and material manufacturers
Subjects: Training will be provided in each of the following areas:

[1] Selection and refinement of materials
[2] Body and glaze preparation
[3] Molding
[4] Firing
[5] Glazing and decoration
[6] Gypsum molding making

(5) Seminars

Object: The latest information on trends in production technology, overseas markets, new products overseas, etc. will be conveyed to the ceramic industry.
Coverage: Related parties in the ceramic industry as a whole

2. Enrollment and Number of Times Held

Course	Enrollment	Training duration	No. of times offered a year	
			1st year	2nd year on
Basic course	5 to 10 persons	5 to 7 days	4 times	6 times
Expert technician training course	3 times	5 to 10 persons	3 months	2 times
Private manager training course	3 times	5 to 10 persons	2 months	2 times
Skilled worker training course	5 to 10 persons	1 month	3 times	6 times
Seminars	20 to 30 persons	1 to 2 days	2 times	2 times

Training of Staff of Ceramic Center

1. Dispatch of Japanese Experts

It is desirable to dispatch Japanese experts to the Center for the purpose of training the research and development staff and the training staff in the Center. A summary of the dispatch of experts is provided below:

Field	No. dispatched	Term of dispatch
Materials, preparation of body, preparation of glaze	1 person	12 months
Molding, firing, decoration	1 person	10 months
Design	1 person	8 months
Fluorescent X-ray, X-ray, TG-DTA, TMA	1 person	3 months
Refractory related measuring equipment	1 person	3 months

2. Training of Center Staff in Japan

It is desirable to dispatch staff of the Center to Japan for training so as to acquire the knowledge and technical skills required for research and development at the Center and for implementation of the training. A summary of the dispatch of trainees is provided below:

Field	No. dispatched	Term of dispatch
Manufacturing sector as a whole	2	6 months
Research, development, testing	2	6 months

3. Time Schedule

		6	12	18
Dispatch of Japanese experts				
• Materials, preparation of body, preparation of glaze	1 person (12 months)			
• Molding, firing, decoration	1 person (10 months)			
• Design	1 person (8 persons)			
• Fluorescent X-ray, X-ray, TG-DTA, TMA	1 person (3 months)			
• Refractory related measuring equipment	1 person (3 months)			
Training of Center staff in Japan				
• Manufacturing sector as a whole	2 persons (6 months)			
• Research, development, and testing	2 persons (6 months)			

<Countermeasure 3>
Checking and grading of raw stone and stabilization of quality

Lampang clay, an important material for the Thai ceramic industry, is in many cases supplied and utilized without analysis of its quality or grading. This not only results in uneven quality of the ceramic products, but also wastes precious resources. It is necessary to promote the effective utilization of Lampang clay and to stabilize the quality of ceramic products by analysis of the quality and grading of the raw material. To make this possible, it is necessary first to explain to the companies supplying raw materials for ceramics and the ceramic manufacturers where the problems lie and the possibilities for overcoming them and to make them understand the same. The policy unit in charge of the ceramic industry must exhibit a coordinating function so as to establish a balanced relationship between ceramic manufacturers and raw material companies.

[Program 3]

Establishment of raw material analysis and grading system in NIPC

•Engaging of foreign experts

Experts will be placed in the Ceramic Section of the NIPC (Northern Industrial Promotion Center), the necessity and importance of analysis and grading of raw materials will be explained to the raw material mining companies and ceramic manufacturers in the North to convince them of the same and a desirable system of grading and supply will be deliberated on and possible measures will be considered.

•Grading by cooperation of raw material suppliers

In this regard, with the assumption of the active use of the functions for analysis and grading of raw materials established in the Lampang Ceramic Center (test machines for degree of combustion), raw material suppliers will be encouraged to perform grading.

•Establishment of raw material processors

Simultaneously with the opening of the Lampang Ceramic Center, consideration will be given to the possibility of establishment of raw material suppliers through joint investment among ceramic manufacturers and a new framework for supply of raw

materials will be started.

<Countermeasure 4>
Activities for promotion of exports of ceramics and raising the consciousness of the production areas

In the Thai ceramic industry, the numerous small and medium sized enterprises in Chiang Mai and Lampang have only just begun to export. It is important to proceed with export promotion activities, with government assistance, in parallel with improvement of quality and product development. In this regard, it is essential that the Department of Export Promotion (DEP) of the Ministry of Commerce and also the Department of Industrial Promotion (DIP) of the Ministry of Industry, the local administrative organizations in Chiang Mai and Lampang, and related industrial organizations closely cooperate with each other. Further, particularly in Lampang, it is considered important that the recognition and understanding of the ceramic industry by the local residents be heightened as part of the promotional activities.

[Program 4]

Campaigns for promotion of ceramic industry

The following series of campaigns may be carried out in cooperation with the Ministry of Commerce's DEP, the Ministry of Industry's DIP, and the industrial organizations:

• Marketing activities aimed at key overseas markets
  - — Obtaining grasp of market trends and dissemination of information to the industry
  - — Selection of promising products of small and medium sized enterprises and participation in foreign trade fairs
  - — Dispatch of export promotion missions made up primarily of small and medium sized enterprises to above trade fairs
  - — Participation of domestic small and medium sized ceramic manufacturers in international trade fairs in Bangkok and invitation of ceramic buyers missions from abroad

• Sponsoring of Lampang/Chiengmai Ceramic Festival

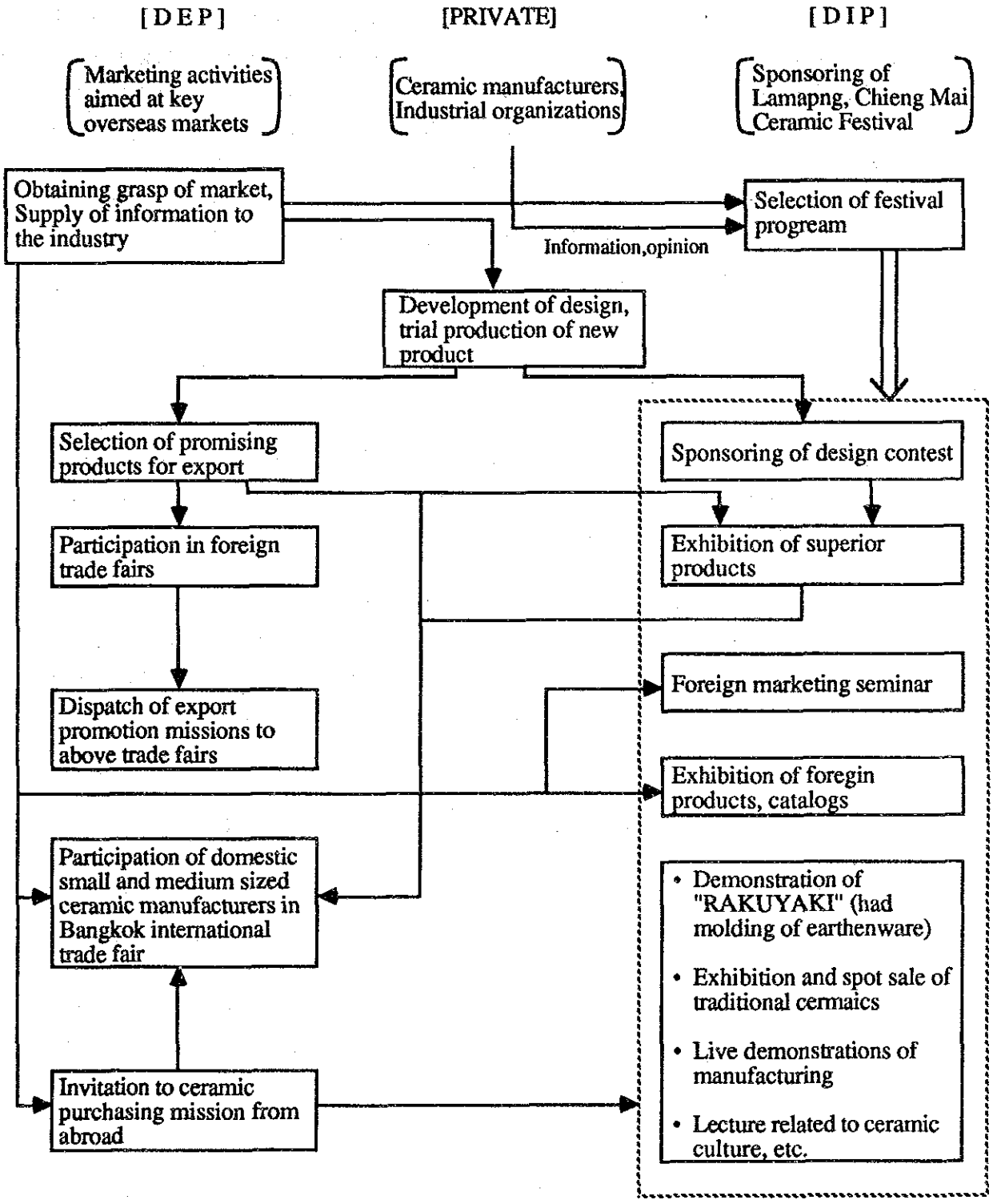
—Setting period of about one week a year and preparing various types of events for ceramics, for example:

- Superior design contest
- Exhibition of superior products, including products submitted for above (consideration may be given to cosponsoring of this with existing exhibition)
- Exhibition of foreign ceramic products and catalogs
- Demonstration of "RAKUYAKI" (hand molding of earthenware and audience participation in same)
- Exhibition and spot sale of traditional ceramics, live demonstrations of manufacture, etc.

Note that the effect would probably be much greater if these two campaigns could be linked with each other through the cooperation of the DEP, DIP, and industrial organizations.

Also, aside from this, a directory of domestic manufacturers (indicating the company names, addresses, production lines, size of business, etc.) should absolutely be prepared by policy unit through the cooperation of the DEP, DIP, and industrial organizations and should be distributed to foreign importers through the DEP.

Fig. I-7. Campaigns for Promotion of the Ceramic Industry



Reference: Lampang Ceramic Park

1. Background

At the present time, there are not so many inquiries about export ceramic products in Lampang, so the production capacity of these products is also rather limited. Further, Lampang has been slower than the Bangkok region in expanding its production capacity for such products. Under the present situation, little progress is being made in setting up a production system for export products due to the small number of inquiries simultaneously, no inquiries are coming in due to the lack of a production system. Faced with this dilemma, there is no motivation for improving quality - a costly proposition.

2. Object

The object is the promotion of a shift in the weight of markets targeted by Lampang manufacturers from the low quality, low price product market to a higher quality and price product market. Further, the object is the promotion of a shift in export products to fields with larger volumes.

Inquiries on export products to manufacturers in Lampang may be considered to be mostly from wholesalers and marketing companies in Bangkok. There are not that many inquiries seen coming directly from overseas buyers. First of all, it is believed important to establish an environment facilitating inquiries from Bangkok wholesalers and marketing companies to Lampang manufacturers.

Therefore, it is considered important to simultaneously push forward with the following five measures so as to strengthen the identity of Lampang as a ceramic production area and to work to increase the trust of the buyers so as to establish an environment conducive to inquiries for export products to Lampang manufacturers.

(1) Creation of a framework for increasing the ability to deal with streamlining and expanded volumes in the distribution and sale of Lampang ceramic products
(2) Creation of a framework facilitating periodic, constant receipt of relatively large orders
(3) Creation of a framework facilitating understanding by Lampang manufacturers of the buyer or overseas consumer requirements as to

quality and design

(4) Creation of a framework for publicizing that Lampang is a ceramic product production area which can fully handle export ceramic products

(5) Expansion of the production capacity to handle export products in the overall Lampang ceramic industry. The capacity of existing factories is believed to be insufficient.

3. Means and Anticipated Effects

An area would be established symbolizing Lampang's position as a ceramic production area. This area would have the following functions:

(1) Establishment or attraction of wholesale function in production area to serve as intermediary with buyers and manufacturers in Bangkok

- Smoothing of business communication between buyers and production area
- Establishment of system enabling overseas buyers to make direct contact with production area
- Increasing reliability in maintaining delivery commitments through control of delivery dates and control of packaging and shipment
- Increasing the convenience of buyers by centralized control of deliveries and shipments for when buyers procure a number of items from a number of manufacturers
- Checking of the quality of shipped products so as to increase the reliability of quality for buyers
- Facilitating a grasp of the demands of the export marketings. It would be better to hear about market assessments and demands from wholesaler functions in the production area, i.e., same Lampang, than from wholesalers in Bangkok in that the amount and frequency of information would be increased.

(2) Periodic sponsoring of trade fairs (once to twice a year)

- Creation of opportunities for securing periodic, relatively large orders
- Strengthening of identity as ceramic production area
- Creation of opportunities for obtaining assessments of Lampang products

- Creation of opportunities for manufacturers to directly learn about assessments of their products
- Creation of opportunities for announcement of new products and new designs

(3) Attraction of factories for export products (10 to 20 companies), in particular, attraction of manufacturers currently planning to establish new factories or expand current ones

- Creation of a certain number of successful examples of factory management by production and shipment of higher quality and price products in Lampang and use of the same as driving forces for changing the Lampang ceramic industry to an orientation toward the export markets
- Establishment of a system for production of substantial volumes of export products so as to attract inquiries from buyers

(4) Use of park area as tourist resource and continuous promotion of visits by tourists. Further, periodic (once a year) sponsoring of ceramic festival.

- Publicitization of Lampang as a ceramic production area
- Creation of opportunities for learning about preferences of overseas markets through foreign tourists
- Creation of opportunities for testing reaction of foreigners to original products
- Assistance in stabilization of amount of work of factories attracted to this area

4. Image of Facilities

(1) Office, warehouse, and packaging and shipment facilities with wholesale function for production area
(2) Showrooms and sales facilities
(3) Rest and service facilities and parks
(4) Model factories for visitors (about five factories)
(5) Ceramic factories (10 to 20 factories)
(6) Clay factories
(7) Ceramic product museum and facilities for demonstration of fabrication of arts and crafts
(8) Utility facilities and management offices

<Countermeasure 5>
Mobilization of incentives for promotion of ceramic industry

To promote the ceramic industries of Lampang and Chiang Mai as locally situated export oriented industries, it is considered effective that the above-mentioned ceramic industry policy unit propose and help finalize comprehensive development plans aimed at modernization through deliberations with the industrial organizations and related government agencies. In these development plans, maximum use should be made of the existing incentives and also, from the viewpoint of promotion of national priorities such as regional industrial development, special application should be made of the BOI investment incentives (for investment of small and medium sized enterprises) in Lampang and Chiang Mai. Also, consideration must be given to promotion of clay manufacturers, glaze manufacturers, and other specialized manufacturers in related fields

[Program 5]

Program of special promotion of ceramic industry

This program is envisioned as incorporating the above-mentioned programs 1 to 4 and also the following:

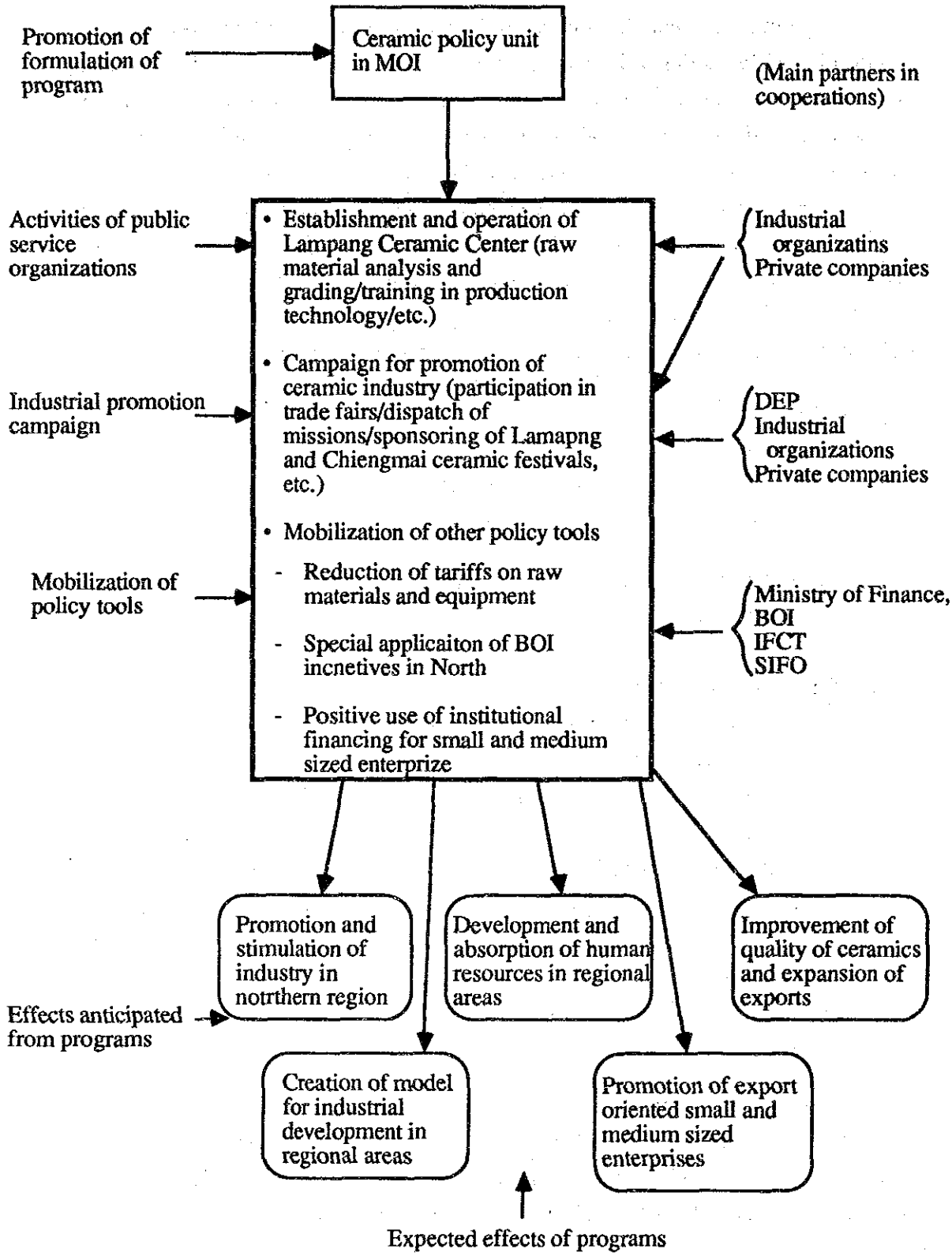
- Reduction of import tariffs on ceramic related materials and equipment
- Exceptional application of investment incentive system

  Special application of BOI investment incentives (including investment of small and medium sized enterprises and investment in related industrial fields) for investment in the ceramic industries of Lampang and Chiang Mai. In view of the national goal of regional dispersion of industry, the establishment of special incentives for the ceramic industries in Lampang and Chiang Mai could be considered as creating an important model for the promotion of industries in other regions in the future.
- Positive use of institutional financing.

  Positive use of SIFO etc.

Note that though the ceramic industry policy unit mentioned in Program 1 will be the central organizer in the proposal and finalization of development plans for the ceramic industry, it is considered important to maintain close communications and cooperative ties with the Ceramic Industry Club and other industrial organizations.

Fig. I-8. Special Programs for Promotion of Ceramic Industry



2-3. Study of Priority Order of Programs

The Thai ceramic industry (tableware and kitchenware and novelties) has overall reached a certain level of development as an export industry, but there are various problems according to region and company size.

These programs have the primary aim of improvement of the manufacturing technology, business management, marketing, and many other aspects of the companies in the North, which are particularly fraught with problems.

The priority order of the programs is as shown in Table I-6.

1) Establishment of Policy Unit for Ceramic Industry

The establishment of a policy unit is considered extremely important in terms of coordinating the related organizations in matters of raw materials, providing support for the establishment of the Lampang Ceramic Center, etc.

2) Establishment of Technical Training Organization Relating to Manufacture of Ceramic Products

The Lampang Ceramic Center will be established and operated after deliberations with industrial organizations, research organizations, etc. headed by the policy unit.

3) Checking and Grading of Raw Materials and Stabilization of Quality

This will be pursued as the matter of greatest priority of the Ceramic Center. In this case, the interests of the raw material miners and ceramic product manufacturers will not necessarily coincide, so first it will be important to obtain a consensus among the related industries.

4) Activities for Promoting Exports of Ceramics and for Raising Awareness of Production Areas

Marketing activities aimed at the overseas markets promote sales and simultaneously are extremely important in that they provide the chance for collecting various types of information. Cooperation of the DEP, DIP, and industrial organizations

would be necessary. The "Festival" must be arranged to serve as a place for demonstration of the products of the local industries to the outside world.

5) Mobilization of Incentives for Promoting Ceramic Industry

For the augmentation of facilities and modernization of the ceramic industry, which includes numerous small and medium sized enterprises, it would be desirable to improve and flexibly apply the existing investment promotion system and financial system. Reduction of the import tariffs on equipment must also be considered.

Table I-6. Study of Priority Order of Programs (Ceramic Industry)

Program	(1) Establishment of policy unit for ceramic industry	(2) Establishment of technical training organization regarding ceramic product manufacture	(3) Checking and grading of raw materials and stabilization of quality	(4) Activities for promotion of exports of ceramic and for raising awareness of production areas	(5) Mobilization of incentives for promoting ceramic industry
Existence of public promotion organization	Yes	Yes	No	Yes	No
Necessity of augmentation or new establishment of the above	Augmentation	Augmentation	New establishment	Augmentation	New establishment
Magnitude of required funds	—	Large	Small	—	Large
Possibility of securing required personnel	Possible	Possible	Possible	Requires effort	—
Magnitude of direct effects	Large	Large	Large	Important in medium and long term	Large
Urgency of implementation of program	1	3	2	4	5
Necessity of external support	Small	Large	Large	Small	Small
Possibility of realization of left of the above	Possible	Possible	Possible	Possible	Possible

Notes: (2) Requires engagement of foreign experts and cooperation with industrial organizations etc.
(3) Requires engagement of foreign experts and cooperation with other government organizations etc.
(4) Requires cooperation with other government organizations etc.
(5) Same as above

Chapter 3. Hypotheses: Policies and Policy Measures

<Hypothesis 1> Policy Drafting and Administrative Organization

Industrial policies will gradually shift from the current policies which stress competition restriction and regulation to export-oriented ones founded on the market economy system. The Ministry of Industry will announce a future "vision" for the industrial structure, unveil measures involving guidance and recommendations for achieving the same, and introduce the sectorial approach method. In preparation for this, some reevaluation of the organizational structure and functions of the Ministry of Industry will be necessary. For example, it will be necessary to look at the establishment of "horizontal" policy functions and "vertical" policy functions.

While the promotion of the supporting industries or subcontracting firms on a selective basis may be within the domain of the BOI, the MOI should be responsible for the overall promotion of the same through generally applicable policy measures.

<Hypothesis 2> Investment Promotion

In order to promote investment in the plastic processing industry or ceramic industry, BOI's promotion measures would likely be adjusted by reviewing its competition-restricting (restriction of new entries) policy or relaxing the export obligation regulation.

In order to enhance the internal linkages of the industries, suppress the dependency on imported intermediate goods, and thereby strengthen international competitiveness and improve the trade balance, it would be necessary to shift to policies which emphasize the promotion of supporting industries, small and medium industries or subcontracting systems. This would lead to the more effective use of human resources, thereby enhancing employment and rural development and making distribution of income more fair.

In addition, we should be aware of the external pressures increasing upon subsidized exports as well as the progress of the international movement toward freer trade and unification of the economic systems through GATT activities.

From this point of view as well, we have to move away from the concept of export promotion and redirect ourselves in line with the concept of industrial development, away from the economics of special privilege and toward the economics of equal opportunity.

<Hypothesis 3> Protective Policies

It would be effective to reevaluate import bans, at least on products from the ceramic industry which have a value above a certain level, with the aim being to raise the level of technical expertise through competition. For products from small and medium sized enterprises, Thailand should move in the direction of promoting modernization of facilities and rationalization of management under certain protective measures.

Regarding plastic products, international circumstances which will force a conversion to more outward-looking policies are beginning to develop.

Generally speaking, regulatory and protective policy measures which were introduced in the era of import substitution industrialization are still in force and tend to hamper market-driven development. Hopefully, this situation is to be reexamined.

In addition, we should bear in mind the progress of the international movement toward freer trade which is likely to impose more restrictions on traditional protective policy measures.

<Hypothesis 4> Tax and Tariff Systems

The tariff structure maintains the basic nature of fiscal revenue source and protection. The high tariffs on intermediate goods are offset by the tariff exemptions of the BOI or the drawback systems of the MOF. However, the domestic intermediate goods industries find the protection effects intended for them cancelled out by those tariff exemption schemes.

Import substitution type industrialization generally follows a process of strengthening competitiveness through learning during a protection period. After the elapse of the protection period, protective measures such as high tariffs and import restrictions are phased out and competitiveness is to be improved through a policy of

competition.

Now that the fiscal dependence on tariff revenue has already fallen, from the point of view of economic welfare, priority should be given to a general cut of tariff rates to replace the "refunding" or "rebate" system and exceptional tax reduction or exemption as a form of export subsidy. The cut of tariff rates in the customs tariff book could have a beneficial effect on indirect exports as well and would be preferable for the non-promoted companies which have no access to the BOI incentives for imported capital goods.

Furthermore, such an institutional change may be required due to the pressures of international criticism of export subsidy policies and retaliatory measures.

Regarding business tax, it is considered effective to shift to a value added tax (VAT) so as to promote the formation of a vertical division of labor in the industry and a subcontracting structure and to promote small and medium sized enterprises and supporting industries.

<Hypothesis 5> Financing System

The biggest problem preventing the spread of public financing is the securing of low-interest long-term funds. The long-term capital market is insufficiently developed. There are limits to the use of foreign loans because of the impact on the fiscal policy and of exchange risks. Under the circumstances, there is no effective source for procuring low-interest long-term capital.

The fact that the Thai long-term capital market is relatively weak could be one of the major obstacles in the way of further industrial development. A stronger capital market which can efficiently supply equity capital and long-term credit will be required in the near future. Some reforms are called for to expand long-term capital flow.

The finance authority, of course, understands the situation well and has already taken some steps such as lifting the ceilings on interest rates for fixed deposits and exempting the interest on smaller fixed deposit accounts from taxations. The authority is working on a three-year plan of deregulation for the finance sector (as of June 1990).

Looking at the SIFO in particular, officials should consider giving it independent status as a special financing institution for small-&-medium enterprises.

<Hypothesis 6> Human Resource Development

A severe shortage of technical staff and skilled laborers is regarded as another major obstacle in the way of further economic growth and it has already started to affect foreign investment in Thailand.

Priority should be given to projects to expand the scale of technical education at the university level.

The facilities of ITVE (Institute of Technology and Vocational Education) and Technical Colleges under the DOVE (Department of Vocational Education) should also be expanded.

To develop skilled labor, the number of NISD (National Institute for Skill Development) could be increased and the facilities of the existing NISDs could be expanded.

Fundamental long-term plans for technical education and training must be drawn up by both the public and private sectors.

Some Japanese-affiliated companies located in Thailand have started to cooperate with both public and private sectors in technical education and training. It is hoped that this kind of technical tie-up will be expanded and it is moving toward that directions.

<Hypothesis 7> Investment by and Technical Tie-ups with Japanese Firms

Japanese small and medium sized enterprises are generally not well equipped with the know-how, capital, or human resources for overseas production. Therefore, the small and medium sized enterprises do not necessarily find it easy to shift production or transfer technology overseas. Only some competent firms can afford.

Most Japanese companies considering investment in Thailand have their eyes on the comparative advantage of Thailand today in the area of labor cost, but at the same time, they are worried about that this advantage may be lost in the near future.

If competitiveness based on comparative advantage in terms of factor costs is

something which is always lost sooner or later, it is necessary to establish an advantage in the area of technology to substitute for the advantage which will be lost. Also from this point of view, it would be urgent to upgrade the technical standards of Thai industries.

<Hypothesis 8> Subcontracting Production System and Rural Development

In Japanese-style flexible production, the emphasis is put on the marketing strategy of supplying diversified product lines in accordance with market demands and on the ability to flexibly change the production lines. In this regard, it is more efficient to use as many subcontractors as possible rather than to install several vertical production facilities in one's own factories.

One of the basic factors in regional development is the strengthening of the linkage with the urban manufacturing sector and the development of industries which would link the regional labor force with the urban industries and overseas markets. In this respect, the development of supporting industries or small-sized subcontractors is an effective policy for the industrialization of regional areas.

<Hypothesis 9> Industrial Statistics

The MOI should be fully equipped with the staff and ability to prepare industrial statistics which would constitute the basis for industrial policy formulation and should establish the principle of making the statistics available to the public.

Fig. I-9 Conversion of Policy Concept

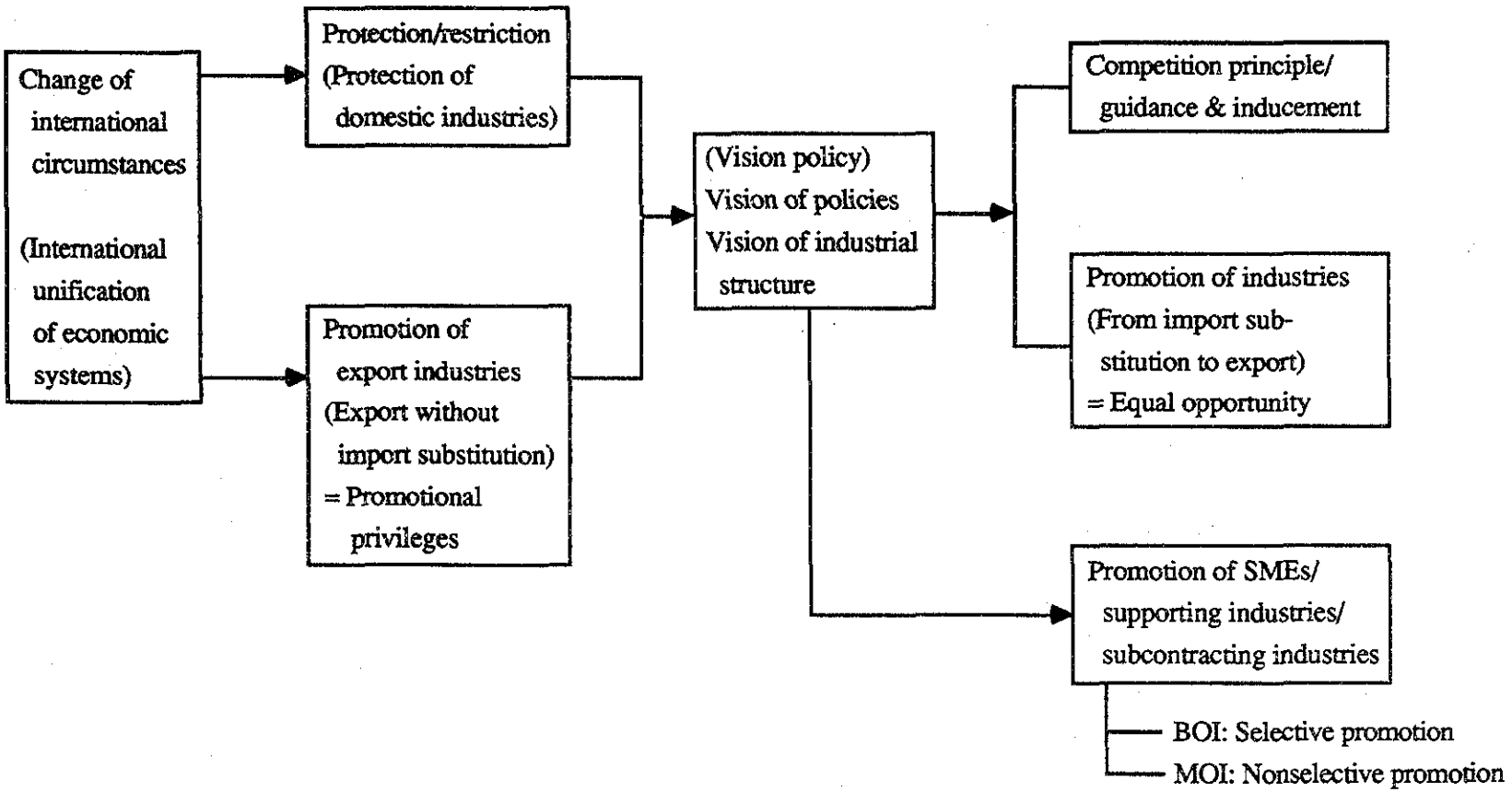
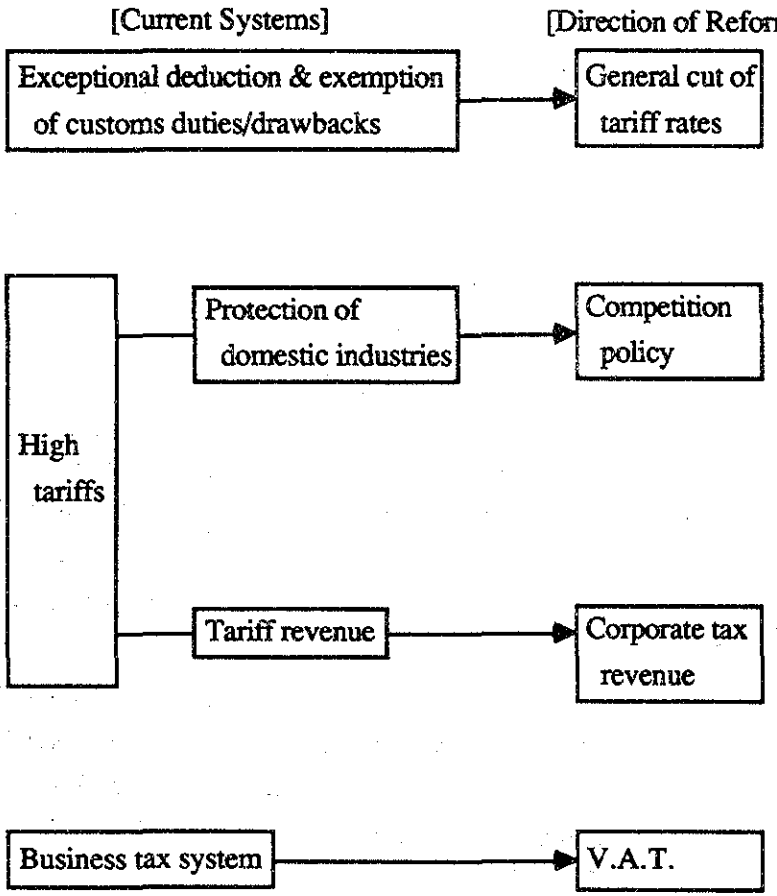


Fig. I-10 Policy Concept of Tax & Tariff Systems



[Expected Effects]

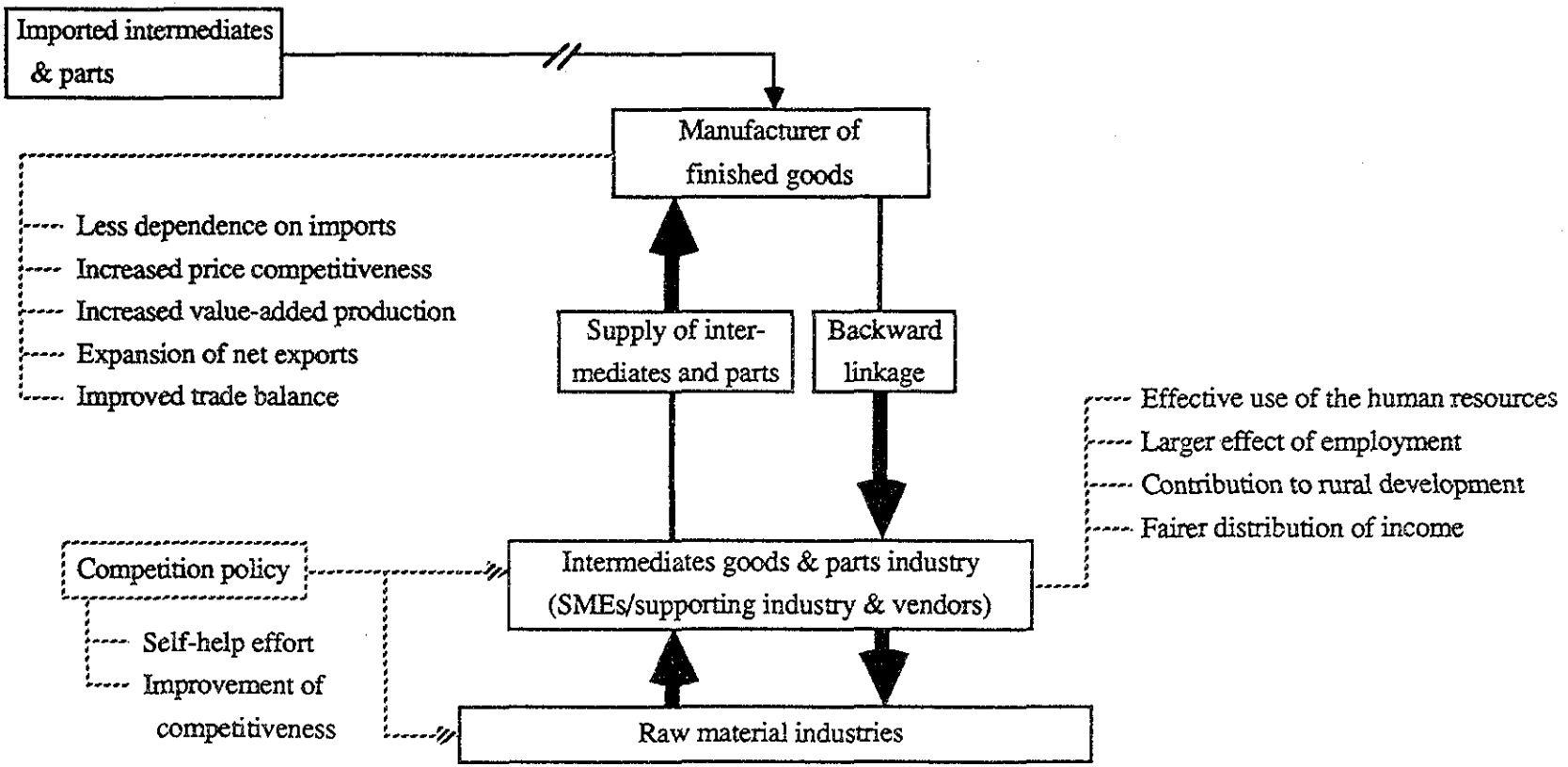
* Beneficial for indirect-export, too
* Even non-promoted companies can pull down the cost of equipment

* Modernization of production & management
* Upgrading of technology & quality
* Decreasing production cost
* Improvement of competitiveness

* Stability of fiscal revenue

* Promote vertical division of labor
* Help construct subcontracting structure

Fig. I-11 Economic Spread of Promotion of SMEs, Supporting & Subcontracting Industries



(Note) —//— Lesser dependence on imports for intermediates & parts

PART-II.
POLICIES & POLICY MEASURES

PART-II. POLICIES AND POLICY MEASURES

Contents

PART-II. POLICIES AND POLICY MEASURES

~ Centering on 3-years' Review ~

Chapter 1. Policy Formulation and Administrative Organization

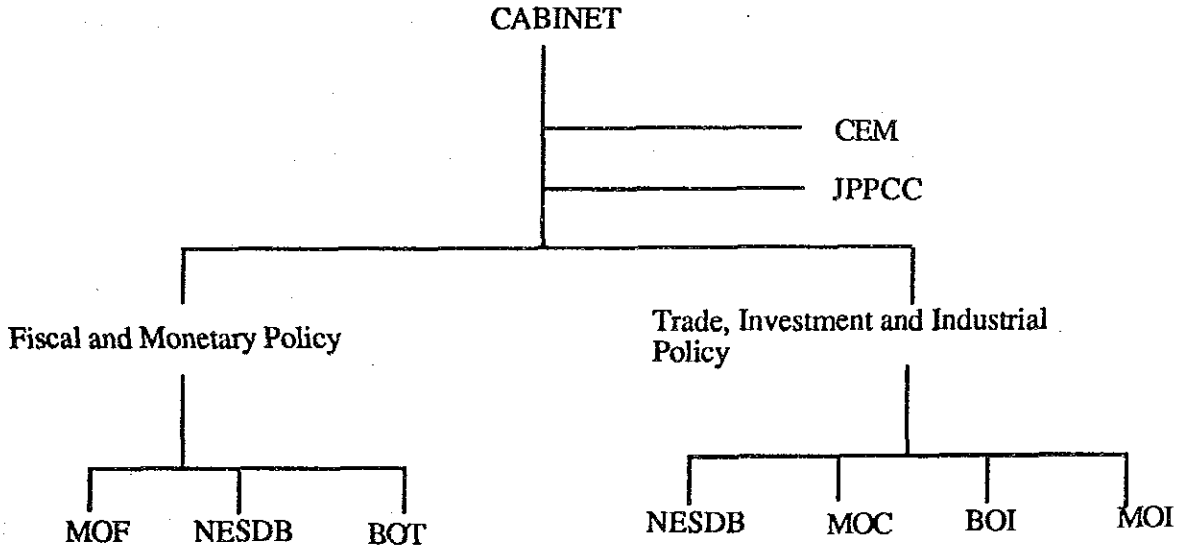
1-1. Policy Formulation of the MOI

1-1-1. Formulation of Basic Economic and Industrial Policies

In recent years, the Thai government has been tackling the improvement of the process by which it formulates basic economic policies. The present process of drafting basic economic policies in Thailand can be illustrated as shown in Fig. II-1.

Macroeconomic policies and fiscal/monetary policies are jointly drafted by the Ministry of Finance (MOF), the National Economic and Social Development Board (NESDB) and the Bank of Thailand (BOT).

(Fig. II-1) Process of Formulation of Basic Economic Policies



(Source) Quoted from The Main Report of *"TDRI Annual Conference 1989"* with some modification

Trade and industrial policies are formulated by the Ministry of Commerce (MOC), the Ministry of Industry (MOI) and the Board of Investment (BOI) under the jurisdiction of the NESDB.

The Industry Minister is one of the members of the Council of Economic Ministers (CEM) and The Joint Public-Private Consultative Committee (JPPCC). He also participates in various committee activities at the national level. The Permanent Secretary of the MOI is a member of the boards of directors of the government agencies concerned such as the BOI and the Industrial Estate Authority of Thailand (IEAT). The MOI is involved through these bodies in the formulation of basic policies for industrial development at the highest level of the decision-making process.

The MOI participates in the compilation of 5-year Plans, complete mid-term visions for development, through the drafting of basic concepts or plans for industrial development. The MOI is also involved in formulating the development policies of basic industries such as oil refining, iron & steel, petrochemicals and chemical fertilizers.

In the process of formulating policies, the JPPCC has been very useful in that it allows the Government to detect the needs of the private sector industries and reflect them in its policies. Before a draft policy is submitted to the Cabinet, the CEM deliberates on the draft and is responsible for coordinating policies and coordinating the activities of the various ministries and agencies concerned.

1-1-2. Formulation of Sectorial Industrial Policies by the MOI

The Industrial Economics & Planning Division (IEPD) is at the heart of the process of formulating sectorial development policies within the MOI, except in the case of industries which will fall under the Petroleum Industry Division (PID) or the Office of Basic Industry Development (OBID).

According to a paper provided by the IEPD, the division comprises five sub-divisions. These are the General Administrative Sub-division, the Industrial Planning Subdivision, the Industrial Policy Sub-division, the Plan Integration & Evaluation Sub-division and the Industrial Information Service Sub-division. It also maintains the Economic Industrial Centers (EICs) located in the North, South and Northeast, which are serving as representative offices.

The Industrial Planning Sub-division has two functions. The first function is to prepare the concept paper on the basic policy of industrial development for the National Economic and Social Development Plan. The second is to study the current situation of each industrial sector and to draft development policies and policy measures for each sector in line with the basic development concept.(1) The plans comprise the master plan, short-term plans and annual plans which incorporate policy objectives, guidelines, policy measures and concrete projects.

The Industrial Policy Sub-division deals with prominent industries for which some action by the Government is needed in order to cope with changes in the social or economic environment. It surveys and analyzes the current state of the industry, then coordinates with other government sections to formulate concrete policy measures to solve the problems.(2)

The responsibilities of the Plan Integration and Evaluation Sub-division may be summarized as follows: (1) coordination of industrial development plans with the policies of other ministries and agencies, (2) economic analysis of public investment projects and determination of priorities for the same, (3) feasibility studies of public projects under the jurisdiction of the Office of the Permanent Secretary of the MOI, promotion of said projects, and negotiation with foreign sources on assistance, (4) monitoring of the progress of projects by other sections of the MOI, other related organizations and public companies under the MOI, (5) monitoring of activities inside the Division, and (6) preparation of reports on the progress of national projects, evaluation of the said projects and submission of measures for improvement.

The duties of the Industrial Information Service Sub-division are: (1) collection of industrial data, (2) processing and analysis of statistics, (3) provision of information to the related sections in the ministry and (4) functioning as a computer center within the MOI (3).

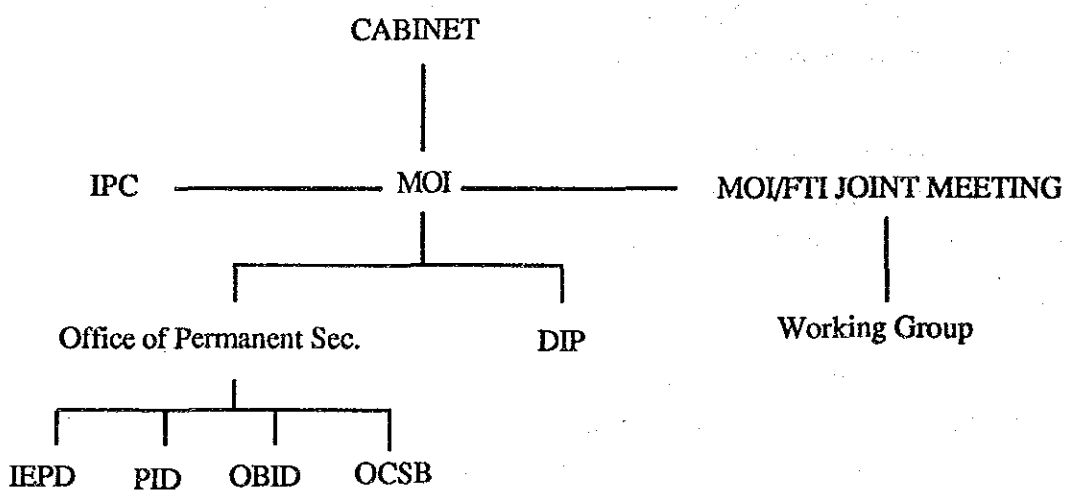
The Economic Industrial Centers (EICs) located in the three provinces are responsible for: (1) provision of information services to regional industry, (2) surveying and analyzing the current state and growth potential of regional industries, and (3) proposing regional level industrial development plans and investment promotion measures based on the concepts of regional development in the National Economic Development Plan.

In addition to the organizations above, the MOI/FTI JOINT MEETING was established in January 1989 to formulate and propose sectorial development policies and policy measures for each industrial sector. This Meeting is chaired by the Minister of the MOI and comprises the Deputy Ministers (two), the Permanent Secretary, all of the D.G.s and the Director of the IEPD. Participating from the FTI side are the Chairman, the Vice-chairman and the Presidents of all of the Industry Clubs. The IEPD is the secretariat. Through this meeting, the policy or policy measures worked out by the Working Group (discussed below) to solve problems are to be discussed and approved. Coordination between the government and the private sector can take place through this meeting.

A Working Group (W.G.) has been established within the MOI/FTI Joint Meeting. The W.G. is chaired by the Permanent Sec. of the MOI and members include the D.G. of the DIP, the Director of the IEPD, one representative of the BOI and five representatives of the FTI. The IEPD is the secretariat. The drafting of policy and policy measures for industrial sectors originates from the W.G. Policies for basic industries such as oil refining, iron & steel, petrochemicals and fertilizers are also to be discussed in this Working Group.

Furthermore, the Industrial Policy Committee (IPC), another important staff organization which is also chaired by the Industry Minister and composed of high-ranking officials from major ministries and agencies concerned, is working as a venue for

(Fig. II-2) Organization for Drafting Sectorial Policies in MOI



(Source) Compiled based upon discussion with IEPD and DIP

coordination within the government at higher levels.

The policies and policy measures formulated through the above mentioned organizations are implemented through other departments and agencies. The DIP implements, particularly on a sectorial basis, various promotional programs, including technical extension services, guidance and modernization programs.

The above is illustrated in Fig.II-2.

1-1-3. Questions Regarding Policy Formulation by the MOI

The Thai Government is small but effectively organized. It is equipped with strategic systems for policy formulation, policy coordination and statistics compilation. In practice, however, it appears that there are a few problems to be pointed out.

For example, in the fields of pre- and post-employment training, technical extension services and R&D, some duplication of policy measures has been found in the course of the survey.(4) For the promotion of foreign investment, the combined wishes of the NESDB and the BOI tend to take precedence over those of the MOI. The BOI's policy sometimes contradicts that of the MOI. It appears that policy formulation machinery is working well, but the same cannot necessarily be said of the policy coordination system.(5)

As seen above, the IEPD is designed basically to tackle industrial policies, both vertical and horizontal. However, judging from the organizational structure of IEPD and its position as merely one of the divisions, it is questionable whether the capabilities of the IEPD in terms of collecting information are sufficient. Another question which should be asked is whether or not the Minister or the Permanent Secretary of the MOI are well-enough equipped with information to participate in high-level debates based on facts and figures.

There is some duplication in the functions of the Industrial Policy Sub-division and those of the Industrial Planning Sub-division and their functions should be streamlined.

The drafting of policies for separate industrial sectors is mostly initiated by the IEPD. It is, however, not necessarily clear if the IEPD has been provided with enough

staffs to deal with such a variety of industrial sectors, even though, in the cases of oil refining and other key industries, the PID and the OBID have been taking the initiative in drafting policies at the bureaucratic level.

It is also unclear exactly where the jurisdiction lies in the MOI for "horizontal (=cross-section)" policies such as those relating to industrial structure, industrial infrastructure, industrial financing, taxes and tariffs, antipollution controls, industrial location, regional development, SMI policy, controls on monopolies, introduction of foreign technology and technical development.

It should be pointed out that the establishment of proper statistics, which may be said to serve as the basic information for drafting policies, will be a major issue for the future.

1-2. Structure and Policy Formulation System of MITI

In relation to this subject, a simple explanation will be given below on what kind of concepts the Japanese Ministry of International Trade and Industry (MITI) is organized, what kind of structure it has and, what kind of process is followed for drafting policies.

1-2-1. Organizational Structure of MITI

The organization and activities of MITI are determined by the Ministry of International Trade and Industry Establishment Law (hereinafter referred to as "the Law") based on the National Administration Organization Law.

A look at the current organizational structure of MITI shows that (1) it is basically comprised of a suborganization for administering international trade matters and a suborganization for administering industry, (2) it has both a horizontal division of work and a vertical division of work, (3) it establishes specialized outside bureaus such as the Agency of Natural Resources and Energy, the Patent Office, and the Small and Medium Enterprise Agency for administering resource and energy matters, patents, and small and medium businesses, (4) it promotes testing and research and development in industrial technology in the Agency of Industrial Science and Technology, and (5) deploys eight regional bureaus and one branch office in diverse regional locations in Japan (Fig. II-3).

In trade policy, the International Trade Policy Bureau has the responsibility for foreign trade policies regarding sweeping international trade problems, economic cooperation, etc. The International Trade Administration Bureau has jurisdiction over trade promotion, export and import control, exchange, financing, trade insurance and other domestically oriented aspects of trade administration.

Regarding industrial administration, there are three vertically divided *Genkyoku* having the function of drafting industry-wise policies, i.e., the Basic Industries Bureau, the Machinery and Information Industries Bureau, and the Consumer Goods Industries Bureau. The Industrial Policy Bureau handles horizontal problems like the industrial structure, financing, taxation, business activities, commodity prices, consumer protection, and distribution, and the Industrial Location and Environmental Protection Bureau deals exclusively with the industrial infrastructure, pollution, and regional development (Fig. II-4).

In addition to this line organization, there are established such policy drafting organization as the Industrial Structure Council. It is established by Cabinet Ordinance under the Law. There are the Textile Industry Council, Chemical Product Council, and various other advisory committees or inquiry commissions which are not based on the Law. These councils research and deliberate on important matters in industrial policy in response to queries from the Minister of MITI and submit their opinions to the Minister. The councils have the nature of staff organizations, in the parlance of industrial organization theory, with the duty of providing advice and recommendations.

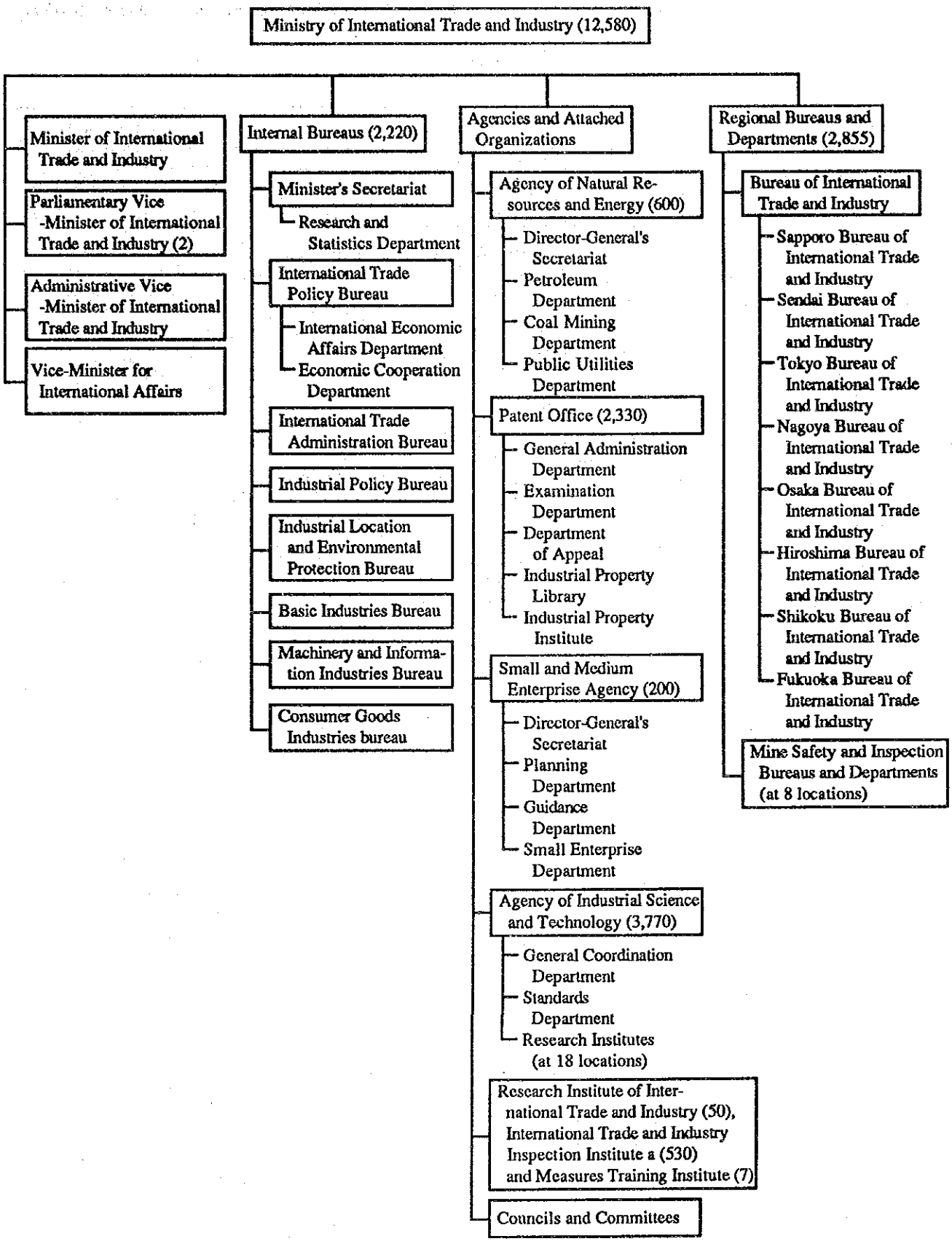
According to the Industrial Structure Council Ordinance, the Council is comprised of within 130 members designated by the Minister of MITI from among knowledgeable persons in the financial, relevant industrial, and academic fields. Members serve for two years on a rotating basis. The chairman of the Council is selected by vote of the members and presides over the Council's affairs. The Council may establish within it sub-councils with chairmen and members designated by the Council Chairman. The general affairs of the Council proper are handled by the Industrial Policy Bureau (more specifically, the Industrial Structure Division). As for the subcouncils, the General Affairs Divisions of the respective *Genkyoku* handle the same. The organizations and activities of the other councils and committees are substantially the same as this, with the General Affairs Divisions of the corresponding *Genkyoku* dealing with their general business.

The Agency of Industrial Science and Technology provides support for private sector R&D activities through financial subsidies, commissioning of research, commissioned tests and research, public use of facilities in the 16 attached research institutes and laboratories, etc. and tackles technical development difficult for the private sector to handle due to large risks.

The organization of MITI is modified extremely flexibly in accordance with changes in the foreign and domestic environment. This enables new policies meeting with environmental changes to be drawn up quickly. The organizational reforms may be made easily by amendments to the Ministerial Ordinance of the Regulations on MITI's Structure and the Cabinet Ordinance on MITI's Structure.

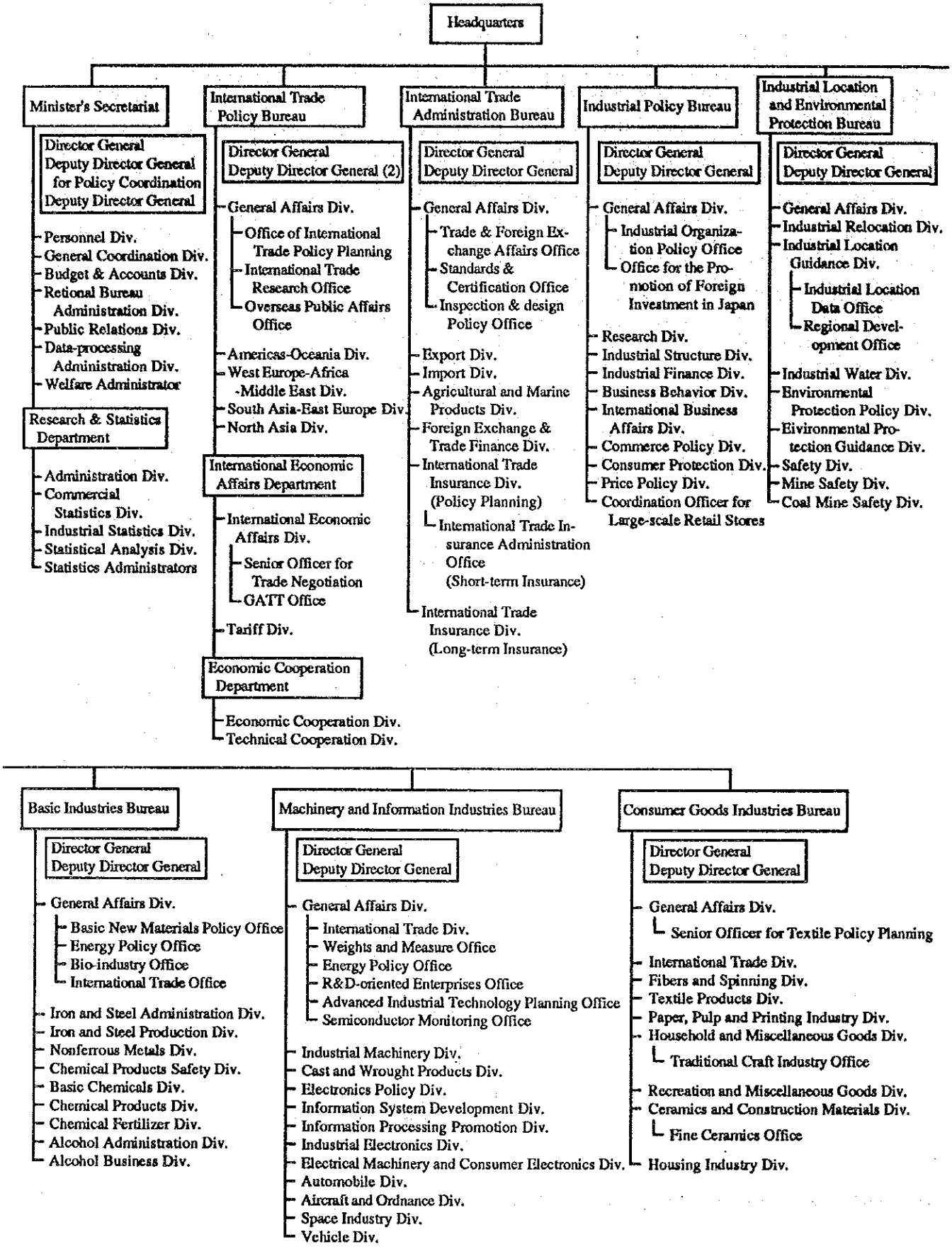
Recently, in the South Asia-East Europe Division of the International Trade Policy Bureau, a special section called the Soviet Union East Europe Office has been established to enable faster response to the changes in the political climate in the Soviet Union and Eastern Europe. Also, the Bio-industry Office established in the General Affairs Division

(Fig. II-3) Whole Organization of MITI



Note: Figures in parentheses represent the approximate number of personnel as of February 1990.

(Fig. II-4) Organization of Internal Bureaus of Ministry of International Trade and Industry (MITI)



of the Basic Industries Bureau was raised in status to the Biochemical Division.

1-2-2. Policy Formulation in MITI

What kind of process is followed in the determination of industrial policies in Japan? An objective overview will be given here with mention of postwar trends.(6) Figure II-5 and II-6 shows the following concepts in a chart form.

In the decisionmaking process for industrial policies, the entity with the most important role is not the legislative sector of the government, but the sections in charge of the industries and in charge of coordination in the ministries and agencies. On the private sector side, there are the various industrial organizations. Further, the various advisory councils and inquiry commissions, which are by nature somewhat intermediate entities between the government and private sector (though belonging to the government in form), play considerably important roles. Further, the financial circle and the banking world, which supplies funds to industry, have considerable influence in industrial policy.

1) *Genkyoku* and Coordinating Authorities

Playing a central role in the determination of industrial policy have been the government administrative bureaus known as the *Genkyoku.* A *Genkyoku* is a bureau in charge of particular industries in the ministries and agencies. There is a separate *Genkyoku* for each group of industries which monitors the industry group and is responsible for all policies concerning that group of industries.

MITI is the ministry with the most such *Genkyoku.* As of 1970, five of the nine bureaus of MITI were so-called *Genkyoku*, that is, the Heavy Industry Bureau, the Chemical Industry Bureau, the Textile and Sundry Goods Bureau, the Coal Industry Bureau, and the Public Works Bureau. These bureaus were further divided into smaller "divisions", most of which were what are known as *Genka* in charge of subsectors of the related industry group. For example, the Heavy Industry Bureau had divisions in charge of iron & steel, industrial machinery, electronics, automobiles, aircraft, and vehicles.

The *Genkyoku* and *Genka* make up the vertical organization, but there are also horizontally organized bureaus and divisions in MITI. The horizontal bureaus as of 1970 included the International Trade Bureau, the Trade Promotion Bureau, the Enterprise Bureau, and the Pollution and Safety Bureau. These horizontal bureaus and the

Minister's Secretariat primarily held the power over policy decisions regarding horizontal policy matters, but at the same time functioned to coordinate among the various bureaus within MITI. Usually, the General Affairs Divisions handled coordination in each bureau.

In the ministry there were various periodic meetings held, such as the meetings of the heads of the General Affairs Divisions and other administrative level meetings (once a week), a legal examination committee (twice a week), bureau meetings, officer meetings, ministerial meetings (each once a week), etc. In addition, at the working level, members of the related bureaus and divisions assembled as needed for irregular meetings to exchange information and opinions. Further, quick communication of intent with local organizations was promoted through the meetings of the Director-Generals of the regional bureaus of international trade and industry and the meetings of the directors of their general coordination departments (each once a month). Above the ministerial meetings, there were meetings of the Administrative Vice-ministers (twice a week) and above that the Cabinet meetings (twice a week). There were also meetings to exchange information at all levels of the organization with related sections in the other related ministries and agencies so as to strive for coordination of policies. In this way, there was a closeknit network of communication and cooperation formed between divisions, between bureaus in MITI, and with related sections in other ministries and agencies.

Further, MITI dispatches its staff to other ministries and agencies and also to local agencies, related organizations and institutions, etc. for temporary tours of duty. This interchange of personnel also plays a large role in the quick communication of intent with related sectors.

The *Genkyoku* and *Genka* were in charge of the drafting of policies relating to the various industries under their supervision. For example, the laws known as the "laws for particular industries", such as the Law on Temporary Measures for the Promotion of the Machinery Industry (1956), the Law on Temporary Measures for the Promotion of the Electronics Industry (1957), and the Petroleum Industry Law (1962) were drafted and implemented primarily by the *Genkyoku* and *Genka.*

The draft policies regarding special treatment in taxation for specific industries, changes in the tariff rates, liberalization of imports, and liberalization of capital were all prepared by the *Genkyoku* and *Genka.* The permits for contracts with foreign enterprises regarding patents and knowhow, permits for joint ventures, permits for establishment or

augmentation of facilities in cases requiring approval under the laws for particular industries, etc. were also under the jurisdiction of the *Genkyoku* and *Genka*. The *Genkyoku*, *Genka*, or the Ministry had the decisive grip on the distribution of funding from government affiliated financial institutions.

Those of the draft policies prepared by the *Genkyoku* and *Genka* of MITI which related to other ministries and agencies were adjusted within MITI and then sent on to the related ministries and agencies where they were studied by the sections in charge and then were checked in terms of content by the Cabinet Legislation Bureau from the legal standpoint. However, it was extremely rare that any change be made at the level of the other ministries or agencies or the Cabinet in the decisions or requirements of MITI. The reason is, as mentioned earlier, several meetings were held at the administrative level and higher to achieve a consensus and agreement on policy matters relating to the other ministries and agencies before the draft policies were officially sent on, i.e., coordination and agreement with those ministries and agencies had been achieved in advance.

The industrial policies proposed by MITI may be roughly divided into two groups. One is the formulation of long-term visions for the industries as basic policies for the same. The other is the creation of special mesures each fiscal year, referred to as "new policies". Long term (10 year) visions of the overall industrial structure, sectorial future outlooks, and other long term basic policies and yearly policies are prepared making use of the Councils and Commissions (Fig. II-5) (Fig. II-6).

The work of drafting the yearly plans, i.e., "new policies," starts one year before. The process is as follows: [1] Each division holds industry hearings, [2] the opinions of other departments of MITI, the regional bureaus of international trade and industry, and other ministries and agencies are heard and a concensus obtained within the government, then drafts of the divisions are prepared, [3] these are deliberated upon in the Councils, [4] the drafts of the various divisions are collected at the general coordination divisions of the departments, [5] the general coordination divisions of the departments adjust the division drafts, then put together plans of the departments, [6] the drafts of the departments are collected at the general coordination division of the Prime Minister's Secretariat where coordination and collation of the ministerial level are performed, [7] a draft request for budgetary allocation is made to the Ministry of Finance, and [8] necessary procedures are followed to revise the related laws, tax regulations, a.s.o. (Fig. II-6)

Since the 1970s, there have been some changes made, for example, the role of the horizontal bureaus has increased in importance compared with the vertical bureaus and the number of cases where the horizontal bureaus have taken the initiative in drafting policies has increased. This is because the policy needs relating to the interests of specific industries have diminished and MITI is becoming increasingly pressed to deal with horizontal policy issues relating to a wider scope of industry than specific industries or the economy as a whole, such as pollution measures, industrial redeployment, promotion of adjustment of structurally recessed industries, development of advanced technology, energy measures, and trade friction.

Note that the Fair Trade Commission, which is in charge of antioligopoly measures, is another important government organization in the process of determination of industrial policies. In the 1950s, the stress in industrial policies was placed on the minimization of competition. So, the Commission was pretty much ignored. Through the 1960s and 1970s, however, the past industrial policies, which restricted competition, were reconsidered. Along with this, the relative importance of the Commission gradually rose. In the future, the participation of the Fair Trade Commission the drafting industrial policies will become increasingly important. Particularly the elimination of cartels, which in the past were considered exempt from the application of the Antimonopoly Law, will be the major issue.

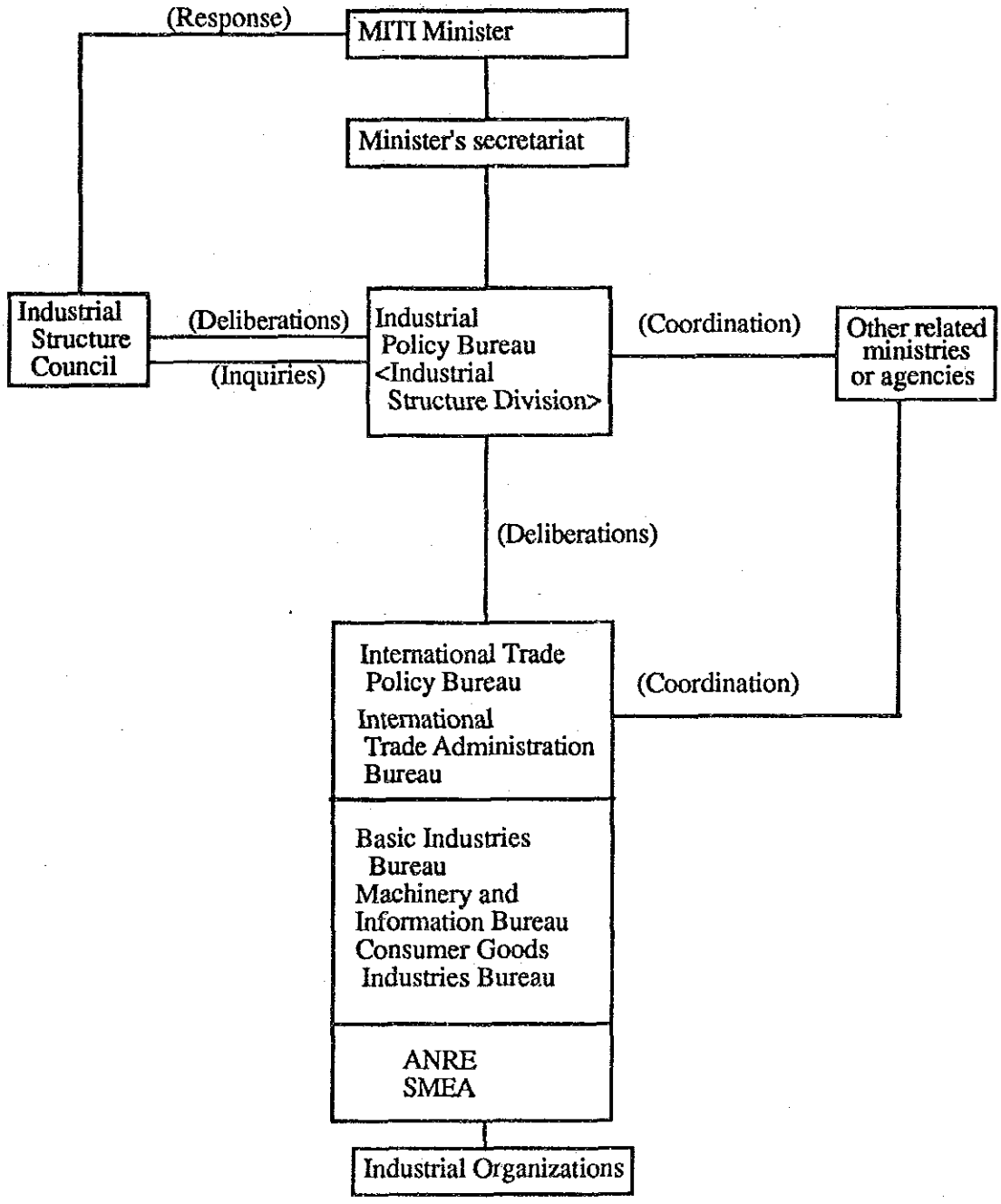
2) Industrial Organizations

There are hundreds of industrial organizations related to MITI, for example, the Japan Iron and Steel Federation (JISF), the Japan Association of Automobile Manufacturers (JAMA), and the Japan Porcelain Manufacturers Federation (JPMF). These industrial organizations work in close cooperation with MITI as counterparts of the *Genka* and *Genkyoku*. The main role of the industrial organizations is to persuade the *Genka* and *Genkyoku* to adopt policies advantageous to their industries (or leading companies). Due to this relationship, some organizations hire retired MITI bureaucrats as their officers. The lobbying with politics constitutes one of the key functions of the organizations.

Regarding the relationship with the *Genka* and *Genkyoku*, in the early postwar years, there was a strong tendency for the government to direct industry, but along with the growth of industry, the government gradually became an intermediary, making adjustments and acting as a mediator in line with its long-term vision.

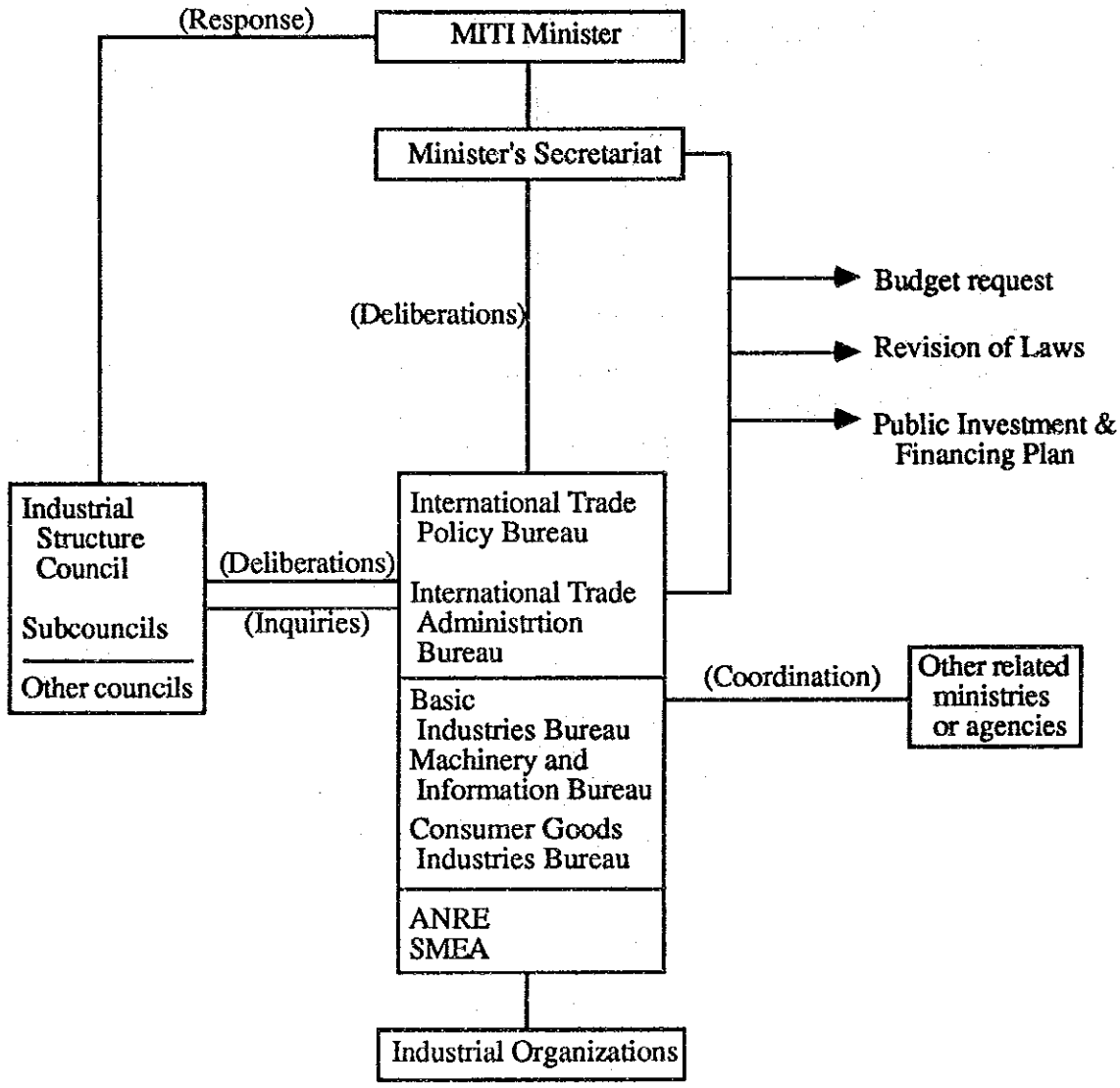
(Fig.II-5) Policy Drafting Process of MITI

— the mapping-out of Industrial Structure Visions —



(Fig. II-6) Process of Drafting Policies at MITI

— the formulation of "New Policies" —



(Note) "New policies" are prepared for each fiscal year to go with the industrial structure visions, sectorial visions, and other long term visions and these lead to budgetary requests, revision of Laws and public investment & financing plans. Overall coordination within MITI is handled by the Minister's Secretariat. The new policies are prepared, making use of the various councils and commissions, by the Industrial Policy Bureau and the Industrial Location & Environmental Protection Bureau in the case of horizontal policy issues and by the three *Genkyoku* in the case of policies of individual industries.

Today, the policies of MITI basically serve to set a future "vision" for an industry, i.e., to show what the industry should be in the future. In principle, the policies are not forced on anyone. A concrete example of this is the "New Textile Vision" formulated by the Textile Industry Council, recorded in the second year report of this survey mission.

MITI has been clearly shifting its industrial policies away from the restrictive policies of the postwar years to guiding policies.

3) Advisory Councils and Research Commissions

In postwar Japan, when the ministries or agencies decided on key matters of policy, the "council system" was used, wherein opinions were solicited from advisory councils or research commissions comprised of private parties (including retired bureaucrats) and policies were determined based on responses to the same.

As of 1970, MITI had 27 advisory councils and research commissions which provided responses to inquiries by the Minister on various issues. Among these, 15 councils studied problems in industrial policies. The Industrial Structure Council deliberates over industrial policies in general, but there are also advisory councils and research commissions which cover individual fields such as the machinery industry, petroleum, the coal industry, electronic data processing, the aircraft industry, and energy as a whole.

As of February 1990, there were 34 advisory councils and research commissions, first and foremost being the Industrial Structure Council, related to MITI (including the Agency of Natural Resources and Energy, the Patent Office, the Small and Medium Enterprise Agency, and the Agency of Industrial Science and Technology). Further, special councils are established for chemical products, aircraft, the textile industry, the traditional craft industry, petroleum, coal, and data processing. In addition, there are subcommittees for individual industries in the Industrial Structure Council.

The members of the advisory councils and research committees are appointed by the Minister of MITI and mostly are industrial leaders, members of the financial sector, and retired bureaucrats. In addition, there are academics (university professors), journalists (newspapers), and other knowledgeable persons and, if necessary, consumer representatives. The primary selection of members is made by the *Genka* in charge.

The advisory councils, by nature, coordinate opinions of government and industry and serve as the forum for coordination of interests among different industries and enterprises. Therefore, passage of the deliberations of the advisory councils means the coordination of various interests has already ended and that the policies agreed upon there will be subsequently implemented smoothly at least insofar as the related industries go.

A point about the functions of the advisory councils which should be viewed with great importance is the exchange of information and mutual persuasion which go on. The advisory councils have been extremely effective for the collection, exchange, and dissemination of information regarding the industries. This is highly evaluated as having contributed greatly to the development of the Japanese economy. At the advisory councils, estimates are made of the future demand for various products both in Japan and overseas, new technologies are introduced, projections made of required equipment, funds, and supply of materials, and efforts made to coordinate the investment, production, and funds from a macroeconomic viewpoint. This accumulated information and the medium and long term visions announced by the government present to the private sector projections on the demand and prices for various industries, thereby supplying information on a free basis. Further, the repeated supply of such information enables a more suitable equilibrium to be found and strategies for achieving that equilibrium to be presented to private economic interests.

1-2-3. Statistics Prepared by MITI

Statistical data provides the basic information for all sorts of policies. Whether industrial policies or agricultural policies, no policy can be suitable if not based on statistics. Further, in the drafting of industrial policies, use is made of a wide range of statistics covering everything from population to education, not only production statistics and imports or exports.

In Japan, there are statistics for almost all fields, including industry. Numerous people in government ministries and agencies, government affiliated organizations, private organizations, etc. are engaged in preparation of such statistics.

The statistics handled by MITI include industrial statistics (statistics for individual industries, covering number of business establishments, number of employees, wages paid, value of materials used, values of shipment, values of production, added values, investments in tangible fixed assets, etc. by type of industry, by scale of firms and by

regions), statistics for individual industries covering production, shipments, inventories, orders received, and capacities of equipment, statistics on natural resources and energy, commercial statistics, etc. These statistics are put together by the Research and Statistics Department of the Minister's Secretariat. For collection of data from the industrial world, active use is made of various industrial organizations through the various *Genka* or *Genkyoku*.

1-3. Suggestions for the Policy Drafting System of the MOI

1-3-1. Industrial Policy Concepts

Past Thai industrial policies have been based on import substitution which protects domestic industry through high customs duties and tariffs, import restrictions and restrictions on new entries into the production markets, as well as the promotion of export-oriented industries and exports through the introduction of foreign capital.

The MOI has been handling some of these industrial policies, including some relating to horizontal policy matters. However, participation by the MOI in the formulation or implementation of industrial policies has tended to be limited, in practice, to regulatory, discretionary and competition-restricting policy measures using the various permit systems as a tool, and to technical extension services.

Along with the internationalization of the economy, the industrial environment will increasingly move toward one based on a competitive market economy system. Industrial policies will have to move from those relying on competition limiting or restrictive measures to those based primarily on guidance and recommendation. The vision for the industrial structure of Thailand in the future and visions for individual industrial sectors are to be presented. It is hoped that the basic policies for the realization of these visions will be of the "guidance" type.

From a long-term perspective, the MOI should participate more positively in the formulation of industrial policies. It should be more responsible for basic industrial development policies. Toward this end, the MOI should be more suitably equipped in terms of organizational structure and authority. It must also maintain close communication with the other related ministries and agencies.

A vision of an industrial structure should indicate the targets and long term strategy for the promotion of the supporting industries and medium and small subcontractors. Regional development, including decentralization of industries, and promotion of research and development activities are also major policy issues for the Ministry of Industry. Specific strategies and techniques should be considered for how the Ministry of Industry should tackle these issues. How should it work with the BOI and how should responsibility be divided? If the area of responsibility of the BOI with regard to these policy matters is selective promotion of individual companies, then the more

general policy measures should be considered by the Ministry of Industry. At that time, the Ministry of Industry should have the authority to use several policy tools within the limit of the GATT regulations. Particularly, when devising financial and tax measures, MOI should set up a system for deliberation with the Ministry of Finance and it should be endowed with the requisite authority for the same.

The sectorial approach to export promotion under the leadership of the MOC in close coalition with the private sector has proved to be effective in Thailand. The same sort of approach would also be effective for industrial development. The sectorial approach for industrial development has proven to be effective to a certain extent in Japan, Korea and Taiwan. In particular, the experience of Korea, which followed the Japanese strategy while expanding and improving it, provides much to study.(7)

1-3-2. Reorganization of the Policy Drafting System of the MOI

1). Policy Drafting Organization within the MOI

In the future, the MOI will hopefully implement sectorial industrial promotion measures, decentralization of the industries, promotion of supporting industries and promotion of sub-contracting firms. For the effective implementation of the same, a policy formulation system which is based on the vertical concept and a system of cross-sectorial coordination will be needed as a basic framework.

Here, based on the observations mentioned earlier, consideration will be given to the functions and organization of the MOI.

This is illustrated in Fig.II-7 and Fig.II-8.

1-1) Suggested Policy Drafting System (A)

The survey and research functions of the IEPD with relation to "horizontal" policy issues should be strengthened. In addition, the IEPD should be organized so that it can provide sufficient information to the Minister and the Permanent Secretary for their participation in high-level meetings. The IEPD could perform these functions more effectively if they are divided into separate divisions (8) based on specific issue categories. The most important division will be the one which is responsible for mapping out the industrial structure of Thailand in the future.

If a department responsible for policy drafting based on the "vertical" concept and, therefore, very similar to the "*Genkyoku*" of MITI, is to be established, the existing DIP would be the most likely candidate for it. (Fig.II-7)

In this case, consideration should be given to the merger with and reorganization of the Department of Industrial Works (DIW), which handles permits for establishment of factories, registration, renewal of registration, and other procedural work. The DIW is in a position where it can maintain direct contact with the industry through its work of registering factories, therefore it has the nature, though partial, of a "*Genkyoku.*" By merger with the DIW, it would be possible to augment the organization of the new DIP without increasing the number of staff.

If the present DIP could be reorganized into a "*Genkyoku,*" the second function of the existing Industrial Planning Sub-division, mentioned earlier, and the function of the Industrial Policy Sub-division could be combined and transferred to the new DIP.

The new DIP should serve to maintain close contacts with industry and to engage in research and collection of facts and figures for the purpose of formulating industrial sectorial policies in very close cooperation with the new IEPD. It is essential to maintain very close cooperation with the new issue-oriented divisions of the new IEPD.

There should be a division which is responsible for coordination within the Ministry and coordination among the Ministries/Agencies in the new IEPD, and a division which is responsible for coordination within the department in the new DIP.

A division designed to concentrate on compilation and processing of industrial statistics should be included in the new IEPD. The division should be set up so that it does not handle every aspect of data collection but instead makes active use of the new DIP divisions, regional offices and industrial organizations.(9)

All of the implementing organizations should also participate in drafting policies or policy measures by joining discussions and supplying data and other information.

1-2) Suggested Policy Drafting System (B)

Some of the functions of the present IEPD correspond to those of MITI's "*Genka*" which are responsible for drafting policies from the standpoint of "vertical"concepts of policy implementation. Therefore, if it is not appropriate to reorganize the DIP into a new department which is responsible for "Vertical" policy for individual sectors, the function could be attached, for the time being, to the new IEPD which will also handle "Horizontal" functions. (Ref. Fig.II-8)

If the new IEPD is to incorporate both "Horizontal" and "Vertical" divisions side by side, the same kind of close cooperation as mentioned above must naturally be maintained between the two divisions.

In this case, it would be better to reform the DIP into two organizations, i.e. one similar to the Small and Medium Enterprise Agency (SMEA) and the other similar to the Agency of Industrial Science and Technology (AIST) of Japan or into one where the two organizations are integrated.

2). Organizations for Consultation and Coordination

In the study and collection of information for drafting sectorial industrial policies, it would be very effective to make active use of the knowledge and experience of private sector people. There are organizations based on this concept such as the MOI/FTI Joint Meeting and the Industrial Policy Committee (IPC), both at the higher level. The personnel composition and the standing of these staff organizations, however, should be reexamined.

The present MOI/FTI JOINT COMMITTEE could be reformed to incorporate not only representatives from industry, but also from the national chamber of commerce, the financial sector and the academic world. Participation of some retired high-level government officials and some representatives from foreign chambers of commerce/industry would also be very useful.(10)

The representatives of the MOI should act merely as the secretariat which organizes the meeting and should not join in the debate. However, draft policy papers with statistical information attached must be prepared by the secretariat so that the members of the Committee can have discussions based on the draft papers and make a

report on their conclusions or recommendations. This organization could be called the "Advisory Council" or something similar. In short, efforts should be made to absorb a wider range of experience and opinion from outside the Government.

The existing IPC would be best defined as a high-level inter-ministry coordinating body, but not on the same level as the Minister or Permanent Secretary. The Committee would be composed of the Directors in charge from the various Ministries and Agencies including NESDB, MOF, MOC, BOI, BOT. The above-mentioned draft policy papers for discussion in the "Advisory Council" are to be prepared after securing consensus within the Government through this meeting.

3). Subordinate Organizations

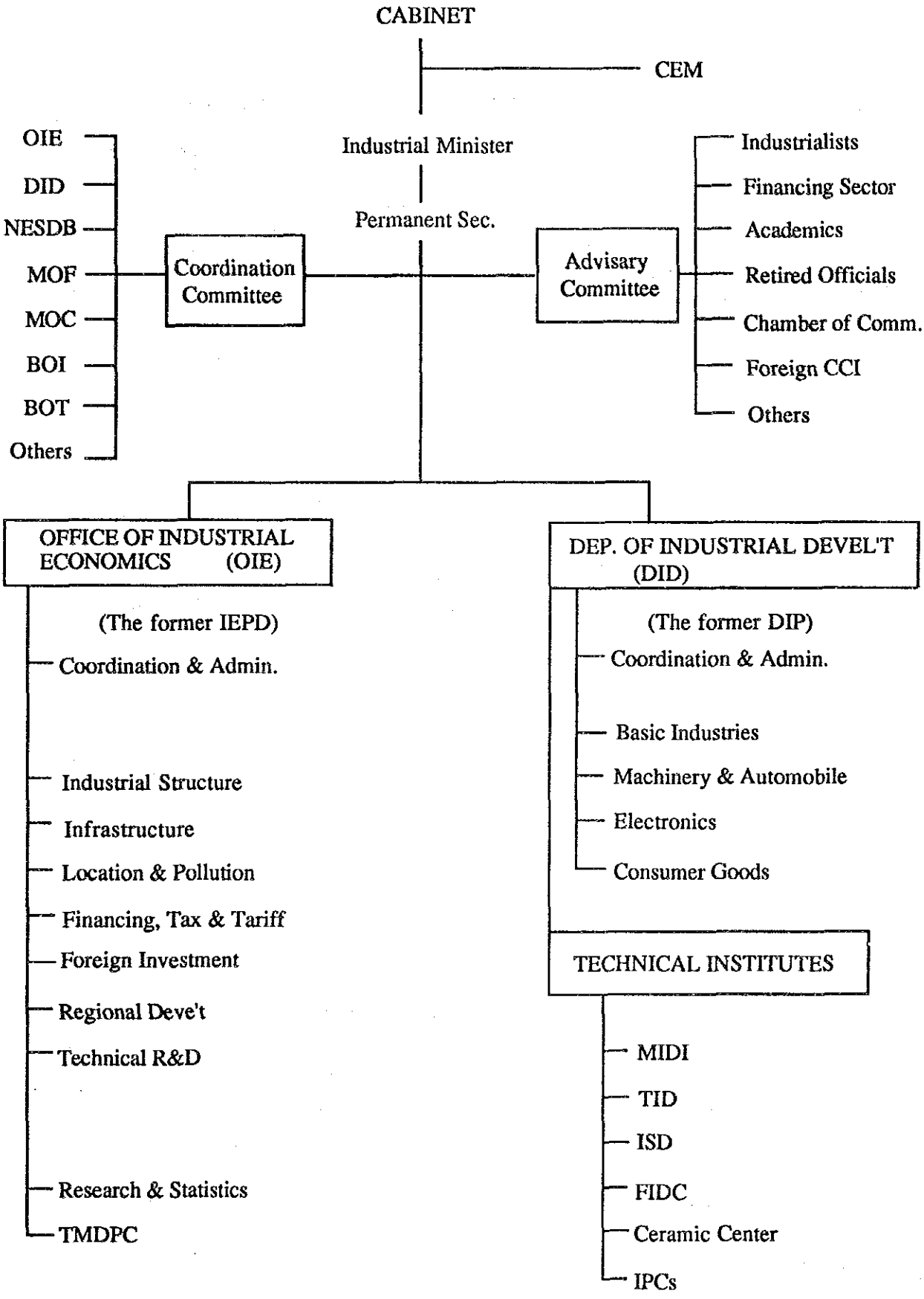
In the case of the suggested system (A) above, the ISD, MIDI, TID, FIDC, the regional Industrial Promotion Centers (IPCs), etc., will function as appendages of the DIP as an "*Genkyoku*" and will implement programs. These organizations, specialized in technical services and training, will maintain close contacts, through their daily activities, with industries and businesses. They will thereby work to be constantly informed of the situation and policy needs of the industries and will funnel the information to the "*Genkyoku*", namely the DIP.

However, looking at the activities of the MIDI, it appears that it will probably be necessary to modify the concepts and functions of these organizations, particularly the TID and the ISD, so that they are of the same standing as technical institutes or similar organizations. Basically, the IPCs should continue with their current functions and systems of providing general supervision and guidance to regional industry.

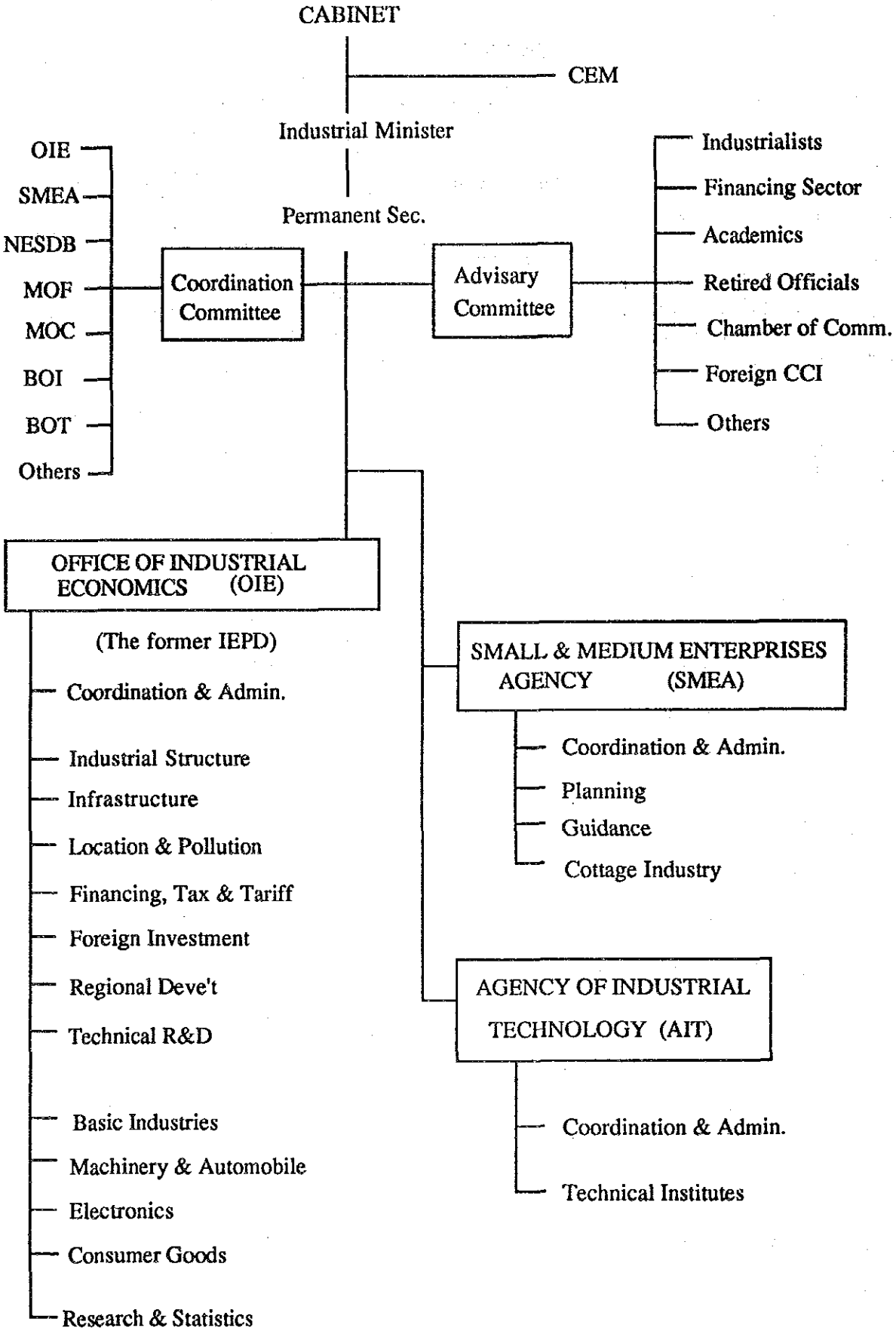
It would be more effective if the regional IPCs and Provincial Industrial Offices (PIOs) had offices in one government building and maintained cooperative relations.

In the case of the suggested system (B), these implementing organizations or technical institutes should be integrated into one organization which is similar to the AIST in Japan under the jurisdiction of the new SMEA. (Fig.II-8)

(Fig.II-7) Suggested Policy Drafting System in MOI (A)



(Fig. II-8) Suggested Policy Drafting System in MOI (B)



1-3-3. Future Issues

A look at the organization of the Thai government shows the Ministry of Industry (MOI) and the Ministry of Commerce (MOC) operating independently of each other. In Japan, however, industry policy and trade policy are handled by one ministry, i.e. the Ministry of International Trade and Industry. The same type of concept is adopted in Korea, Taiwan, and Singapore.

Judging from the Japanese concept, it may be difficult to coordinate policies in a system such as Thailand's where industry is administered separately from commerce. If sufficient communication and coordination were ensured between the two, then problems could be prevented from occurring in advance, but with these separate both physically and organizationally, it is difficult to expect perfection in the crucial areas of exchange of information and communication of intent. If intentions are not sufficiently communicated and coordinated, the result will be noncoordinated policies, as can well be imagined.

The hypothesis that to ensure the integral matching of industrial policies and trade policies, it is more efficient to entrust the two functions to a single ministry may be true. Of course, a full scale study of this from a more specialized standpoint would be necessary. Here, suffice it to say that this is merely a hypothesis.

The separation and independence of the BOI from the MOI means that a large portion of the inherent functions of the MOI are separated from it. Therefore, some of the inherent and fundamental functions of the MOI of drafting and implementing basic industrial policies are now missing from the current MOI functions or tremendously restricted.

As symbolized by the announcement of the change to an IMF Article 8 country, the Thai economy is moving to a more developed stage and along with this Thailand is being asked to open its economy to a level closer to the advanced nations. The inevitable trend will be phasing-out of tariff barriers, protective and restrictive measures, and fiscal subsidies. This trend in the end will invite a step by step reduction of the current investment and export incentives. This will also cause changes in the duties and powers of the BOI. The role of the BOI up to now, that is, the role of promoting investment and export by restrictions and assistance, must be understood as drawing to a close in the long term.

From this long term perspective and consideration of the fact that the separation and independence of the BOI was synonomous with the separation and independence of fundamental functions from the MOI, the remerger of the MOI and BOI seems to be a major issue on hand. However, more specialized knowledge and experience and more time would be required for studying this hypothesis.