

## 5-5 Program for Implementation of Export Promotion Projects

### 1 Background and Objectives of Recommendation

Ever since exports of non-migas products exceeded 50 percent of Indonesia's total exports in 1987, exports of non-migas products have drawn attention as a "growth engine" for the future development of the Indonesian economy. A look at the content of the non-migas exports, however, shows that a limited number of products such as textiles and apparel and plywood and wood products occupy the majority of the export amounts. Promotion of new export products is considered essential.

A look at the six industrial sub-sectors covered by this survey shows that Indonesia has considerable experience in exports of tire rubber and aluminum ingots and other products. However, export products of higher added value will still have to be positively promoted. The results of the survey indicate that in the Indonesian sub-sectors, there are issues such as the fact that [1] the desire to export is still at a low level, [2] the concept of export marketing is not fully implemented, [3] activities of export promotion organizations need to be further strengthened, and [4] the Ministry of Industry needs to tackle export promotion through the improvement of products.

Up until now, most of the exports in the five sub-sectors except handicraft have been made by the foreign capital affiliates and the relatively large sized companies with technical tieups with foreign companies. The small and medium sized enterprises, which account for most of each industry, concern themselves only with domestic sales and only feebly attempt exports. The Indonesian companies in the five industrial sub-sectors may be classified into the following groups according to the level of quality of their products and their international competitiveness:

Class A... Foreign capital affiliates, companies with technical tieups with foreign companies, and large domestic companies with international competitiveness

Class B... Companies following Class A which are sometimes engaged in exports, but primarily engage in domestic sales and which have to cultivate greater international competitiveness through improved production technology and quality control

Class C... The majority of the companies, which concern themselves only with domestic sales of cheap products and which require stronger managerial control

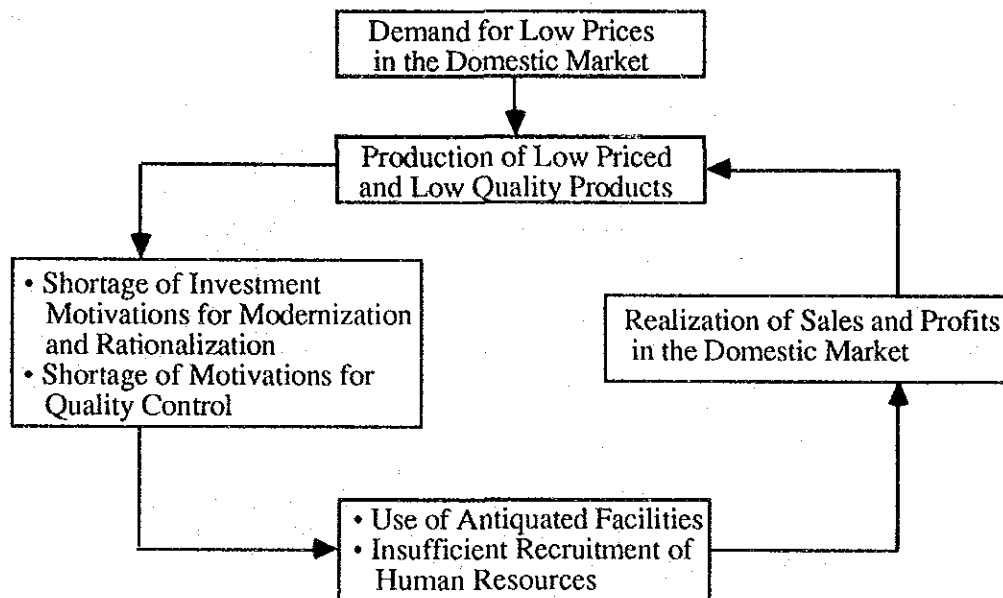
That is, Class A companies already have export experience and are internationally competitive in both price and nonprice aspects. On the other hand, the Class B companies still have not exported much and have to improve their production technology, institute thorough going quality control, and strengthen their export marketing. The Class C companies are oriented toward domestic sales and deal only with production of low price and low quality products in many cases.

An analysis of the factors involved is shown in Fig. 5-5-1. That is, in the domestic Indonesian market, products are remaining low in price or expensive ones will not sell, due to the low per capita income of the consumer and so the level of quality does not come into question in most cases. Further, as the market is a giant one and domestic demand is booming, industry can secure sufficient earnings with just the domestic market. Therefore, there is no need for switching to production of high quality items through quality control etc. A comparison of the differences in the conditions of exports and domestic sales is given in Table 5-5-1. The low quality products are not competitive in the highly competitive overseas markets. For the Class B and Class C companies to really tackle exports, they would find it essential to [1] fundamentally improve quality and

improve their production technology, [2] strengthen their export marketing, and [3] develop better human resources. This is illustrated in Fig. 5-5-2.

The program for implementation of the export promotion project has been recommended on the basis of this concept.

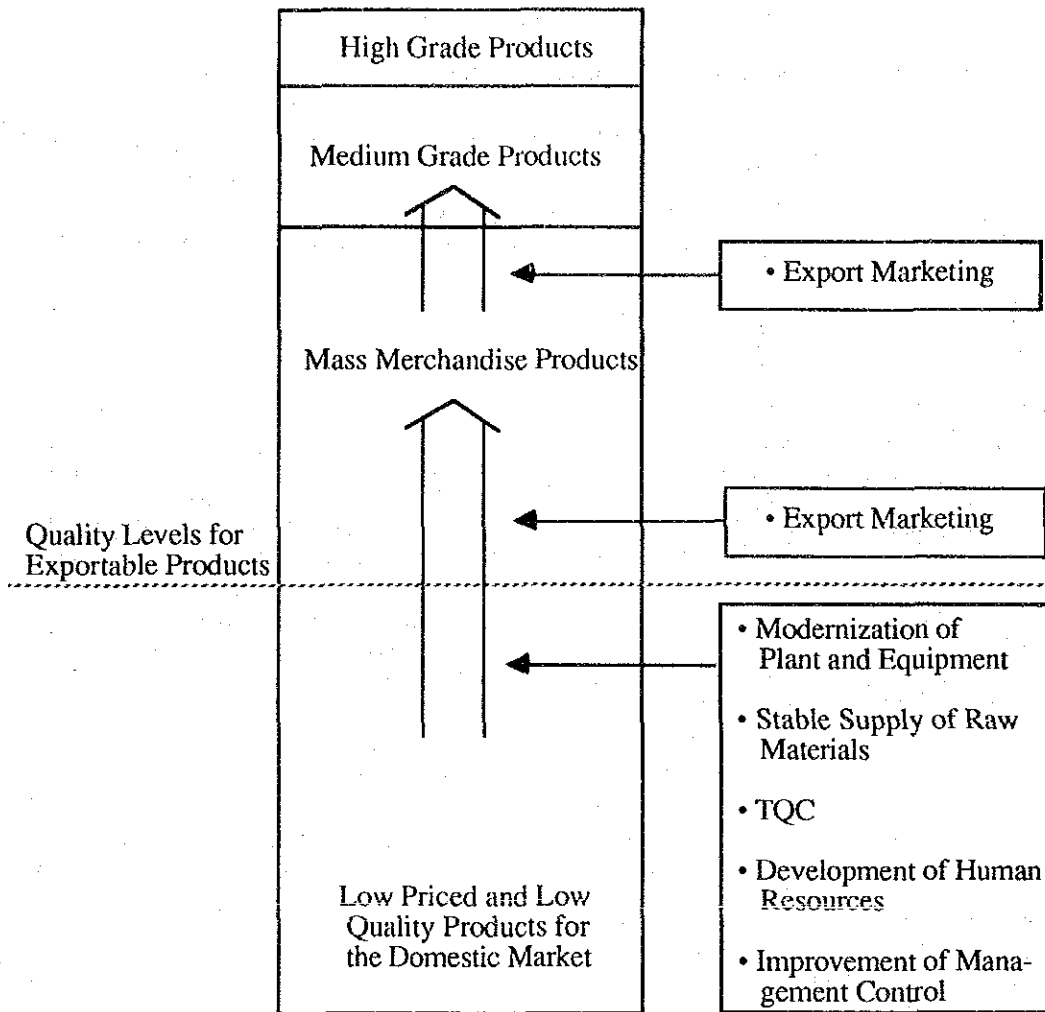
**Fig. 5-5-1: Typical Pattern of Domestic Sales by Medium and Small Scale Firms**



**Table 5-5-1: Difference Between Exports and Domestic Sales (in the case of Indonesian manufacturers)**

	Exports	Domestic sales
Quality	Impossible unless quality is above a certain level	Low quality acceptable
Pricing	Price competitiveness over competing products is necessary	Impossible to sell unless at low prices
Delivery	To be kept strictly	Less strict than in case of exports
Packaging	Clean and durable packaging necessary, and so important as to influence competitiveness	Not so important unless at quality shops
Market Preferences	As changes of market preferences are rapid and intense, collection of market information is important. Constant communication with importers is essential.	Market changes are less intense if compared with international markets
Distribution Channels	Necessary to study and correspond with characteristics of export markets. Unless by proper approach, market disturbance will be caused.	Important, but easier to correspond than in case of exports

**Fig. 5-5-2: Basic Concept for Upgrading Products for Export**



## 2 Detailed Content of Program and Efforts by Ministry of Industry

### 1) Projects to be necessary for Export Promotion

In order to promote exports of industrial products, the following projects will be needed.

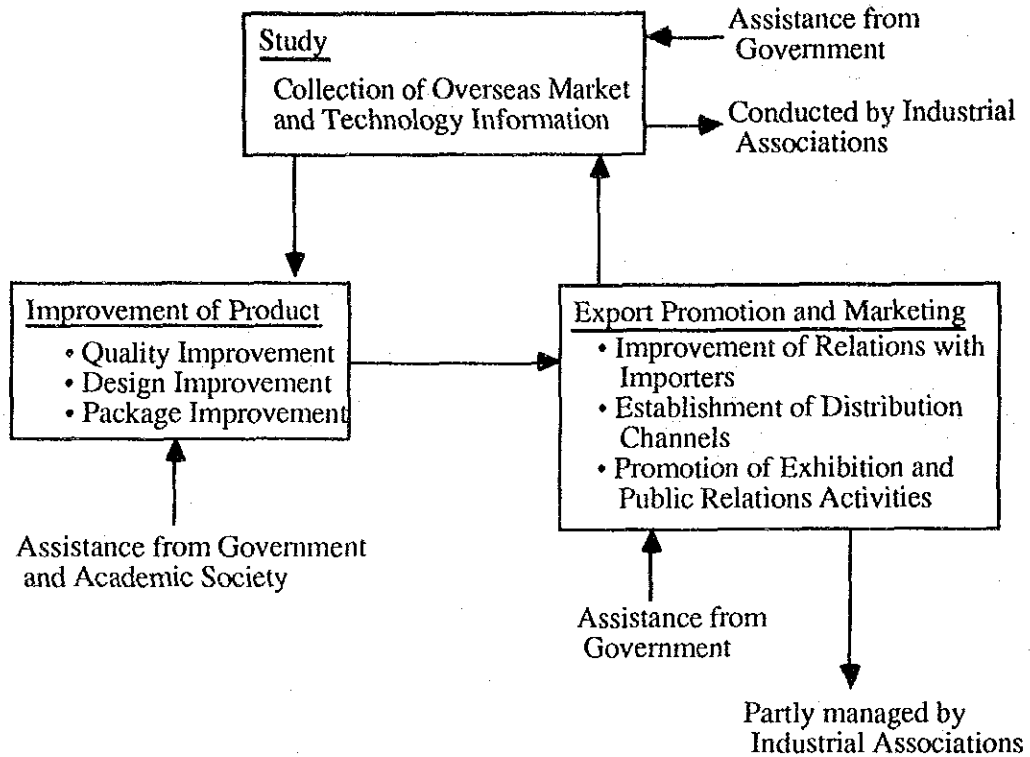
#### (1) Overseas Market Survey Project

In promoting exports, surveys are of the greatest importance. In the establishment of export promotion measures by government and of export marketing strategies by business, it is necessary to start with a grasp of overseas market trends.

The current state of and projections for supply and demand in the market, the state of competing products, the preferences of the consumers and users, price trends and other terms of transactions, policy trends, the political situations, etc. determine what an export marketing strategy should be like. Feeding back this information, measures should be

taken on the production floor and export divisions so as to produce and export products sought in the overseas markets (see Fig. 5-5-3). Surveys will be initiated on the exportable products identified by the six sub-sector study (Table 5-5-2).

**Fig. 5-5-3: Basic Concept of Export Marketing in Broad Sense**



**Table 5-5-2: Examples of Indonesian Exportable Products Identified by Six Sub-sector Study**

Sub-sectors	Examples of Exportable Products*
Handicraft	Ulos, Ikat, Silk Products, Anyaman, Wooden Carvings, Rattan Products, Fashion Accessories
Rubber-based Products	Rubber Gloves, V-belts, Industrial Hoses, Rolls for Spinning
Electrical Machinery	Oil Immersed Transformers, Small Motors, General DC Generators, General AC Generators, Parts and Components such as Carbon Brush, Bushings
Ceramic Products	Sanitary Ware, Tiles, Earthenware tableware, Porcelain Dolls and Novelties
Aluminium Downstream Products	Aluminium Door Frames and Other Building Materials, High Value-added Household Ware, Aluminium Wheels for Automobiles
Plastic Products	High Value-added PVC Sheets, Polyethylene Bags, Woven Bags, Industrial Injection Molded Products such as camera bodies, Other Labour-intensive Products

\* "Exportable Products" means products now being exported and products which are regarded to become technologically exportable in the near future.

Surveys of overseas markets can be performed by [1] companies or industrial associations dispatching personnel overseas to conduct the surveys and [2] commissioning third parties such as research companies or consultants to conduct the surveys. The Government is also expected to provide various forms of assistance, including the utilization of assistance from overseas trade promotion organizations and aid organizations.

### (2) Business Inquiry Project

One way of finding buyers in other countries is to use directories and yellow pages of telephone books, but embassies, trade promotion organizations, chambers of commerce and industry, industrial associations, and other groups also help introduce business partners, thus providing alternative channels of information. The Ministry of Industry will consider working in conjunction with the Ministry of Trade as part of its data bank activities and will also study tying up with foreign data bank services.

### (3) Exhibitions and PR Project

This will be mainly handled by the Ministry of Trade, which will promote participation in international trade fairs and specialized trade fairs held in major cities of the world and also engage in PR activities for Indonesian products through the media of foreign countries. In this public relations, the Ministry of Industry would cooperate with the Ministry of Trade. Another method would be to obtain assistance from governments of the advanced nations and their trade promotion organizations. For handicrafts and light

industrial products showing export potentials, it would be effective to make use of the exhibition space of the Indonesian Export Training Center and the facilities of the Provincial Research and Development Institutes to hold domestic exhibitions and disseminate information.

#### (4) Development of Human Resources Project

In promoting exports, the most important aspect of development of human resources is the training of "international trade personnel" serving as the standard bearers of the export industries. Businessmen well versed in export marketing should be trained through the training of the Indonesian Export Training Center, export seminars, and overseas training. Among the six industrial sub-sectors, for handicrafts and ceramic products, what is being sought most now is the people for "international trade personnel" who would take the lead in exports in the industries.

#### (5) Guidance by Product Experts Project

Product experts will be found domestically and from overseas for each industrial subsector to provide advice on development of export products.

### 2) Current State of Export Promotion Measures and Efforts by Ministry of Industry

#### (1) Current situation

The export promotion measures for non-migas products by the Indonesian Government have been improved or deregulated along with measures for promotion of foreign investment in the series of measures established since 1983 to adjust the economic structure and the policy of deregulation. Specifically, the Government has announced the devaluation of currency, the revival of the drawback system, the abolition of the export approval system, preferential treatment to export companies, the establishment of bonded export processing zones, the deregulation of export-oriented foreign investment, and other measures to ease imports and investment. On the other hand, more down to earth export promotion measures such as exhibitions and overseas market surveys have been taken by the Ministry of Trade, in particular the NAFED (National Agency for Export Development).

#### (2) Efforts by Ministry of Industry

The role of the Ministry of Industry in increasing exports of non-migas products in the medium and long term has been growing steadily, but there are many matters to be tackled by the Ministry of Industry. The biggest reason why the role of the Ministry of Industry is so important is that a change is necessary from the conventional idea of "exporting what is produced" to the new idea of "producing what can be exportable". The roles of the Ministry of Trade and the Ministry of Industry in this may be considered to be split as follows:

- Ministry of Trade (including NAFED) - Promotion and reinforcement of exports of promising exportable products
- Ministry of Industry - Improvement of production technology and increase of production capacities aiming at producing promising export products (including promotion of investment of export-oriented companies)

Although this division of functions by the both Ministries exists, close cooperation between the both Ministries is essential in order to promote exports of the six industrial sub-sectors. In this regard, establishment of such a system in the Ministry of Industry as a "Task Force for Promotion of Export Industries" will be implemented in order to strengthen the cooperation between the both Ministries and also to activate the functions of the Ministry of Industry.

### 3 Measures Urgently Requiring Implementation

#### (1) Creation of Task Force for Promotion of Export Industries Inside Ministry of Industry

Setting up a task force for promotion of exports of industrial products in the Ministry of Industry is recommendable. That is, the following type of task force will be set up through a tieup with the industrial associations so as to cultivate international competitiveness of export industries. Further, policy advisors and product experts will be invited from the advanced industrialized nations.

- Task force leader
- Sub-leader
- Task force officers in charge of
  - Basic metals
  - Machinery
  - Multifarious industries
  - Small-scale industries
  - Basic chemicals
- Assistants

The task force would deal with the following:

- [1] Collection of information on current situation of industries such as production technology issues related to industrial exports
- [2] Sponsoring of meetings with the Ministry of Trade (including NAFED) and other related Ministries and Agencies to exchange information (once per month)
- [3] Sponsoring of conferences on export of industrial products (gathering together representatives of industrial associations and large corporations to set export targets, discuss measures to improve production technology, and exchange information)
- [4] Presentation of awards to companies contributing to Indonesian exports (setting certain conditions and presenting awards once a year or whenever the occasion arises and studying overseas training etc. for recommended persons in the awarded companies)
- [5] Information dissemination to private sector (publication of a journal and data bank services, etc.)
- [6] Guidance of production technology to the company for export possibilities
- [7] Study on promotion programs of export-oriented industries implemented in various overseas countries by the Ministry of Industry

(2) Even before the establishment of such task force, the Ministry of Industry will initiate the following projects on their own initiative.

#### [1] Survey Project

Concerning targeted sub-sectors, industry attaches situated in overseas Indonesian Embassies and the Directorate Generals concerned in the domestic scene will collect



export inquiries and industrial information. Survey result will be disseminated to domestic companies in addition to Ministry of Trade and export promotion organizations.

[2] Guidance on Production Technology and Industrial Design

Receiving cooperation from overseas economic cooperation agencies and R&D Institutes, technical guidance will be offered to domestic export-oriented companies.

[3] Participation to and Campaign for exhibitions and export promotion missions

In cooperating with NAFED and overseas economic cooperation agencies, participation to exhibitions and export missions will be campaigned.

## 5-6 Program for Promotion of Foreign Investment and Technical Tieups

### 1 Background and Objectives of Recommendation

#### 1) Background

Foreign direct investment plays an important role in promoting export-led industrialization. Direct investment in the manufacturing industry involves not only the transfer of capital but also the transfer of comprehensive management resources related to all production elements -- human resources, goods, money, technology, and information -- together with the transfer of production technology, management techniques, and marketing know-how. In most cases, moreover, it does not create additional debt. Consequently, foreign direct investment is expected to make a significant contribution to the development of export-oriented industries.

The Indonesian economy achieved high growth of 7.4% in 1989 and in 1990. This figure was considerably higher than the average annual growth target of 5.0% laid down in the fifth five-year plan (REPELITA V). Factors contributing to this growth included increased exports and greater investment, with exports of non-migas products and foreign direct investment playing an especially large role. Some of the main factors behind the increase in exports of non-migas products were the improved export competitiveness brought about by the devaluation of the rupiah since September 1986, the progress of industrialization, and the increase in foreign and domestic investment.

Foreign investment in Indonesia began a steep rise in 1988, and significant growth continued on into 1990 (see Table 5-6-1). In 1990, there were 608 cases of BKPM-approved new and expansion investment totaling \$8,750 million, representing increases of 65.7% and 85.4%, respectively, over the previous year. New investment accounted for about 70% and expansion investment about 30% in total cases and values, while the increase rate of the latter was much larger than that of the former. An increasing trend of foreign investment has been continuing in 1991.

**Table 5-6-1: Foreign Investment in Indonesia**

(Unit: millions of US dollars)

	1986	1987	1988	1989	1990	1967-1990
Japan	80	554	318	769	2,241	9,667
Hong Kong	15	129	258	407	993	3,731
U.S.	144	80	672	348	154	2,175
The Netherlands	33	122	112	283	567	1,962
(West) Germany	17	331	955	7	13	1,862
R. Korea	12	23	223	466	723	1,860
Taiwan	18	8	914	157	618	1,744
U.K.	45	9	94	43	58	1,292
Singapore	100	8	132	166	264	1,071
Others	269	54	531	1,632	2,296	8,946
Total	848	1,481	4,409	4,719	8,750	38,678

Note: Figures indicate the value of new and expansion investment approved by the BKPM.

Source: BKPM

The main characteristics of this increase in foreign investment are as follows:

- (1) When viewed by nationality, investment by Japan and the Asian NIEs -- the Republic of Korea, Taiwan, Hong Kong and Singapore -- is on the rise, accounting for more than half of all investment in 1990. Investment by manufacturers from these countries/regions is characterized by the presence of many export-oriented plants. In addition, many of these Asian NIEs projects involve the transfer of production of labor-intensive goods, which are fast losing their competitiveness at home.
- (2) In terms of industry sectors, labor-intensive fields such as textiles are the most common, but large projects from the petrochemical sector and infrastructure-related ventures such as industrial estates have also appeared. In addition, investment by small and medium-sized corporations is also on the rise.
- (3) Greater interest is being shown by foreign investors in Indonesia as a production base, including export production. The wave of foreign investment which swept Thailand and Malaysia during the second half of the 1980s is now reaching the shores of Indonesia.

Japanese firms are increasing direct investment in Asian manufacturing industries, and locally they are increasing their emphasis on production for export. According to a study conducted by the Ministry of International Trade and Industry, Asian sales by Japanese-affiliate manufacturers consisted of 66.9% local shipments and 33.1% exports in fiscal 1983/84, while for fiscal 1989/90 the figures were 63.9% and 36.1% respectively. The share of exports to Japan grew from 10.8% to 15.8% during this period; to within the Asian region, from 8.2% to 9.7%; to North America, from 8.2% to 6.0%; and to Europe, from 3.1% to 3.3%. Thus exports to Japan and the Asian region are on the rise.

Recently, Japanese direct investment in Indonesian manufacturing industries has focused increasingly on export-oriented industries and has contributed to the expansion of Indonesian industrial product exports. To take the case of Japanese companies in the industry sub-sectors covered by the second-year survey, aluminum sashes and ceramic sanitary ware are good examples. In addition, although this does not involve direct investment, an increasing number of Japanese companies are providing technology for licensed production and exports specially-developed products to the Japanese market.

**Table 5-6-2: Destination of Sales of Japanese Manufacturing Affiliates in Asia**

	FY1983/1984	FY1989/1991
Total values of sales	100.0	100.0
Local sales	66.9	63.9
Export sales	33.1	36.1
To Japan	10.8	15.8
To North America	8.2	6.0
To Asia excluding Japan	8.2	9.7
To Europe	3.1	3.3
To other regions	2.8	1.3

Source: MITI

## 2) Objectives

The favorable cycle of direct foreign investment, industrial development, and export-oriented industrialization provided the motive force for dynamic economic growth in the Asian NIEs. This tide is now reaching ASEAN shores, and in Indonesia as well a favorable cycle of foreign direct investment and export expansion is now being established. In order to reinforce this trend, efforts to relax restrictions will be continued while at the same time stepping up efforts to attract investment by foreign companies.

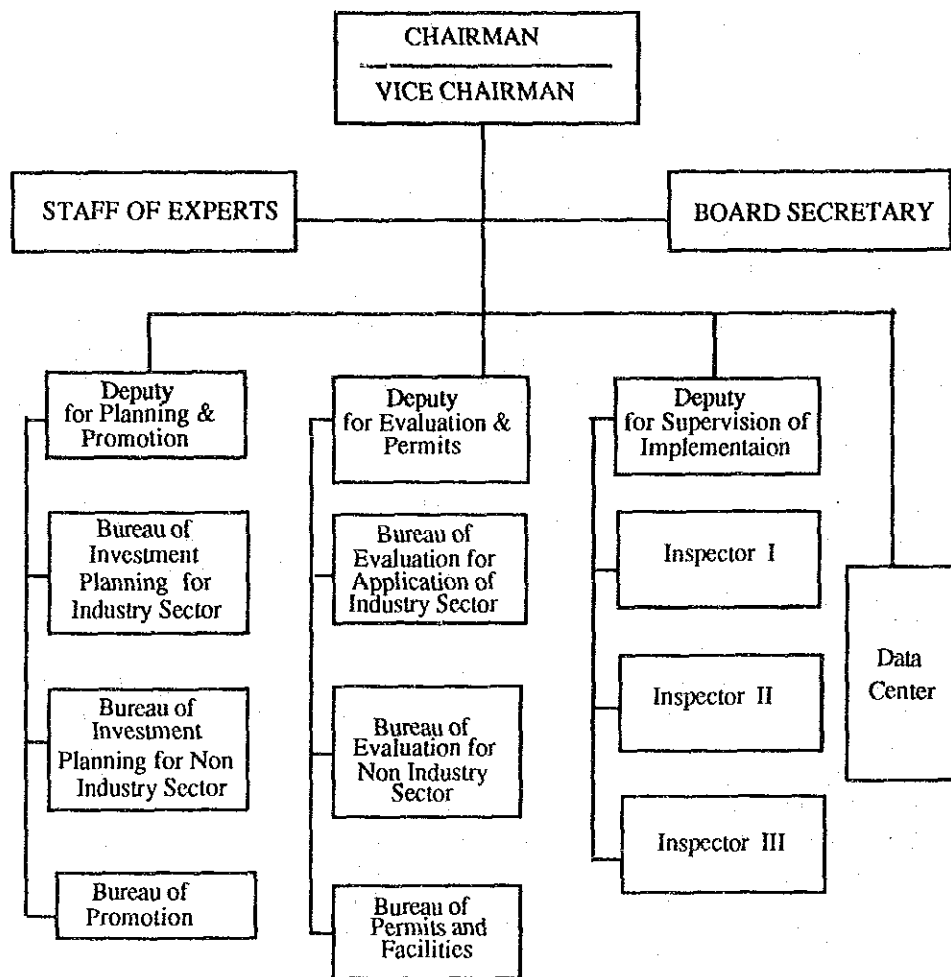
Among the six industrial sub-sectors covered by this study, the five sub-sectors other than the handicraft industry are all open to investment by foreign companies and such investment is being actively encouraged. Investment by foreign companies and technical tieups with such companies have contributed much to the increase of production capacities and exports in the sub-sectors since the late 1980's. Further, a survey of Indonesian companies and Japanese companies in the five sub-sectors other than handicrafts confirmed that both groups desired joint venture investment and technical tieups. The Indonesian companies and Japanese companies indicating interest in this are listed at the end of the sub-sector reports.

## 2 Detailed Content of Program

### 1) Strengthening of Linkage Among BKPM, Ministry of Industry and Industrial Associations

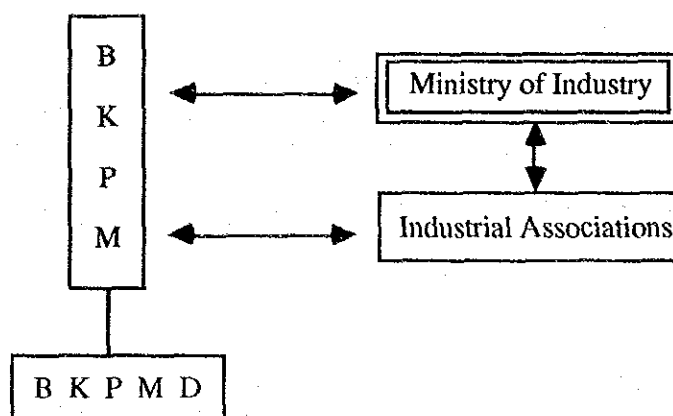
At the present time, the BKPM (Badan Koordinasi Penanaman Modal, Investment Coordinating Board) serves as the channel for administration of investment in Indonesia and for investment promotion activities. This organization was established and as agency under the direct jurisdiction of the President and performs the tasks of coordinating ministries and private investment along with development plans, approving investment projects, and engaging in investment promotion activities. The BKPM is headed by a chairman and vice chairman under which are established three bureaus (see Fig. 5-6-1) and branches in 27 provinces (BKPMD). These provide investors with "one stop" services such as approval of projects, exemptions of import duties, and visas for foreign experts. Procedures have been streamlined and as a result the time required for approval of foreign investment has been shortened to about six weeks from the submission of the initial application. Further, the BKPM has foreign experts including a Japanese advisor dispatched from the JICA who provide advice on investment policies, etc.

Fig. 5-6-1: Organization Chart of BKPM



This investment advice service desirably will be augmented and strengthened for the different industrial sub-sectors covered by the study so as to further attract foreign companies. The investment promotion activities of the BKPM currently are general ones not focusing on any specific industries. Therefore, to promote foreign investment targeting on the industrial sub-sectors covered by this study, it would be effective, it is considered, to make effective use of the findings of this study and have the Ministry of Industry take the initiative and push the foreign investment promotion project discussed below in contact and cooperation with the BKPM and the industrial associations (for example, ASAKI for ceramic products and FIPLASIN for plastic products). Further, to attract Japanese companies, it would be desirable to revive the Japanese office of the BKPM in addition to expanding activities of the Indonesian Embassy in Japan. Foreign experts including Japanese in BKPM are desirably to be continued for providing advise on investment policies in accordance with change of investment climate and diversified needs for investors.

**Fig. 5-6-2: Organization Chart for the Promotion of Foreign Investment to Industrial Sub-sectors**



**2) Collection and Supply of Information and Matching of Companies Interested in Investment**

With interest rising in investment by foreign companies in Indonesia and in technical tieups, interested companies are looking for basic information relating to Indonesia. When foreign companies invest overseas, they always collect large amounts of information at the advance preparatory stage, engage in various surveys, and then make their investment decisions. In this case, the information required goes beyond [1] the general investment environment such as the investment systems and infrastructure and includes [2] information on partners, [3] investment and market trends for individual sub-sectors (the relevant industries, supply and demand trends of products, industrial associations, main production companies, etc.), and [4] information on products which can be locally procured. A look at the findings of the survey on the interest of Japanese companies in investment and technical tieups with Indonesia run for the sub-sectors covered by the study shows that those companies can find out about [1] using the pamphlets of the BKPM etc., but most companies point to a lack of information on [2] to [4]. Further, even regarding [1], there were quite a few comments that the situation in Indonesia could not be understood as clearly as in other ASEAN countries, so there is still room for broader PR activities. Quick supply of information on newly established industrial estates is requested by Japanese potential investors.

Also, from the survey on the interest of Indonesian companies in joint venture investment and technical tieups with foreign companies, also run for the industrial sub-sectors covered by the study, it was learned that there was a great need for information such as on the industries concerned, information on overseas technology for products, major production companies in Japan and the other advanced nations and in the Asian NIEs etc., and companies interested in joint ventures and technical tieups.

It is recommendable, therefore, that the BKPM, Ministry of Industry, and industrial associations liaison and cooperate with each other to implement and augment a project to collect and maintain the following type of information and supply information on Indonesia to interested foreign firms and foreign information to interested Indonesian firms. As to how to supply the information, consideration should be given to preparing publications and, in the future, establishing a data base. In view of the current shortage of data for individual sub-sectors, effective use should be made of this study report (for example, preparing pamphlets on individual sub-sectors). Also, it would be desirable to

provide a rudimentary matching service tying up foreign companies and Indonesian companies showing interest in joint venture investment and technical tieups.

#### [1] Information on Indonesia

- Investment environment, including investment systems and infrastructure
- Industrial sub-sectors and market trends (industries concerned, supply and demand trends for products, industrial associations, main production companies, etc.)
- Products which can be locally procured
- List of companies interested in joint ventures and technical tieups
- List of related organizations

#### [2] Overseas information

- Industries concerned and trends in overseas technology for products
- Main production companies in advanced countries and Asian NIEs
- List of companies interested in joint ventures and technical tieups
- List of related organizations

#### 3) Dispatch and Reception of Missions

In addition to augmenting the supply of information on 2), visits between Indonesian companies and foreign companies indicating interest in joint venture investment and technical tieups would be effective in improving communications and uncovering business opportunities. Therefore, it is advisable that the BKPM, Ministry of Industry, and industrial associations coordinate with each other and continue with and strengthen the overseas dispatch of joint public and private mission for promoting investment and technical tieups and the reception of similar missions from abroad. In this case, it will be necessary to go beyond general investment and technical tieup promoting missions and increase the number of missions targeting specific sub-sectors and to hold seminars and make arrangements so that interested companies can have the opportunity for concrete business talks. Further, preferably related foreign and domestic organizations should be involved as much as possible and followups be made by Indonesian diplomatic offices abroad.

#### 4) Promotion of Dialogue with Companies Investing in Indonesia

The BKPM and Ministry of Industry would take the initiative and promote a dialogue with foreign companies already investing in Indonesia so as to obtain a grasp of the problems in their operations and work to solve the same. As the channels for the dialogue with foreign companies, organizations such as the chambers of commerce and industry of the other countries are seen as suitable. It would be effective to try out periodic dialogues. This type of dialogue is often seen in the advanced countries and developing countries and is an effective means for attracting foreign investment, keeping it after entry, and contributing to the society and economy of the host country.

#### 5) Strengthening of Measures for Promotion of Overseas Investment and Technical Tieups

The general measures of Indonesia for promotion of foreign investment and technical tieups have been effective along with the series of deregulation measures and measures to introduce the principle of market competition. The recent increase in foreign investment is a good example of this. From the standpoint of the promotion of the industrial sub-sectors covered by this survey and the supporting industries producing

auxiliary materials, parts, dies, and the like, however, there are no measures targeted at these fields and offering generous incentives.

Most foreign companies give high marks to the current measures Indonesia has taken to promote foreign investment and technical tieups, but desire further improvements in view of the policies of the other ASEAN countries, pointing to the elimination of the abatement of corporate taxes and the refusal in principle to recognize 100 percent foreign equity companies except for investment in the Batam Island.

There are probably good reasons behind all of these, but for the promotion of the industrial sub-sectors covered by this survey and the supporting industries related to the same, a study is recommendable to be made of strengthening measures for promoting foreign investment and technical tieups targeting specific sectors. Foreign investment and technical tieups will contribute not only to the promotion of industrial sub-sectors and the related supporting industries but also to the development of industrial bases as a whole through technology transfer.

### **3 Measures Urgently Requiring Implementation**

The industrial sub-sector reports of this survey have all come out. The information revealed in them should be made active use of in making approaches to companies interested in foreign investment and technical tieups by implementation of the following projects among those listed in 2. At this time, the BKPM, industrial associations, and foreign legations would desirably be made to function integrally in their activities under the initiative of the Ministry of Industry, the counterpart in this survey. Further, use would be made of overseas assistance in implementing the projects.

- 1) Matching service of companies (Indonesian companies and Japanese companies) interested in joint ventures and technical tieups as shown in the industrial sub-sector reports
- 2) Provision to foreigners of information on the investment environment of Indonesia and its industrial sub-sectors
- 3) Collection and maintenance of overseas technical information and information on main production companies in the industrial sub-sectors and supply of the same to Indonesian companies
- 4) Dispatch and reception of missions for promoting foreign investment and technical tieups



## **5-7 Program for Strengthening of Research and Development Institutes under Ministry of Industry**

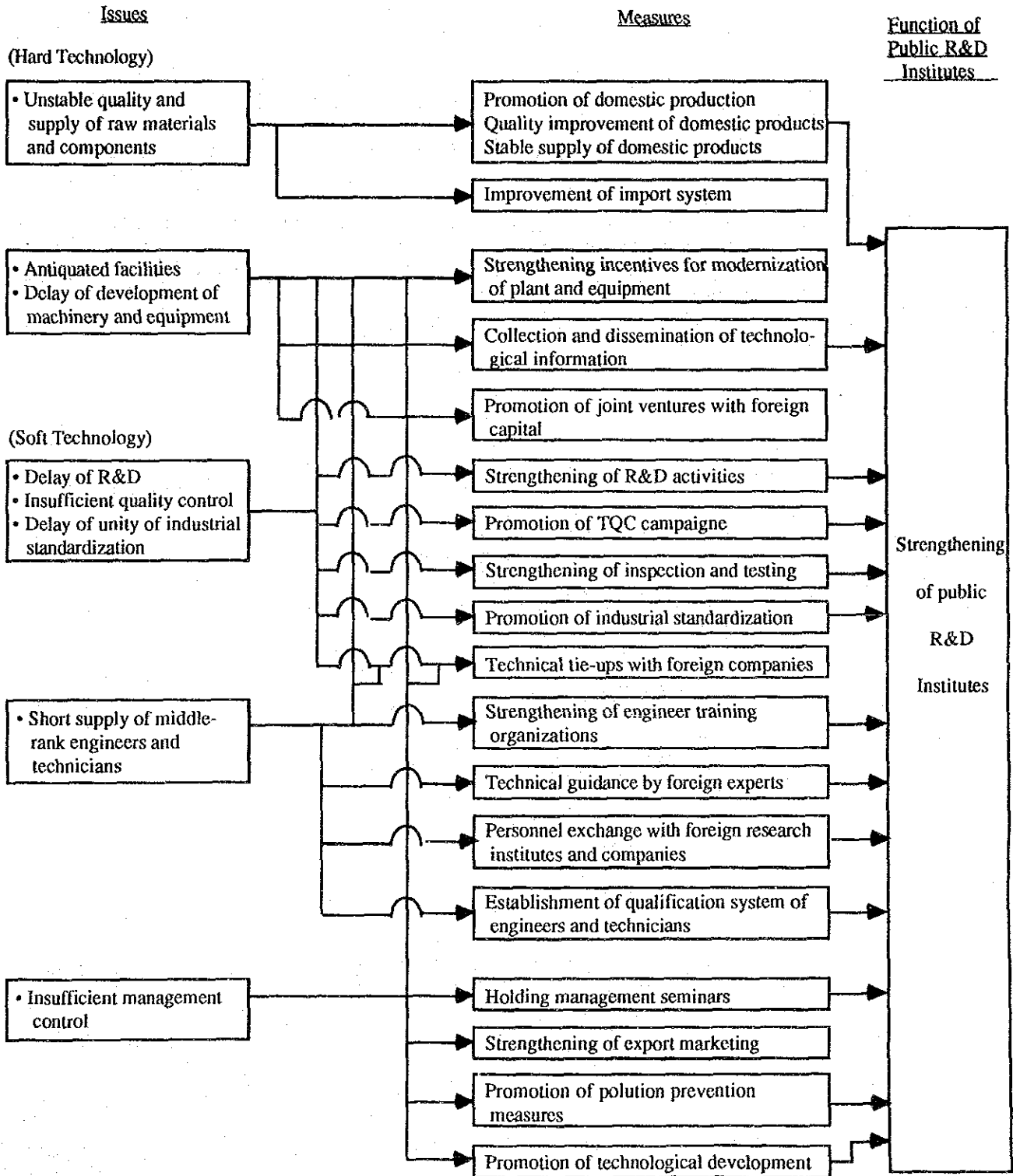
### **1 Background and Objective of Recommendation**

#### **1) Roles of R&D Institutes**

To develop the six industrial sub-sectors of Indonesia into industries with sufficient international competitiveness, the industrial circles will have to pinpoint the problems faced in the five areas of raw materials, equipment, human resources, technology, and management and move to implement measures to deal with the same. However, the private business belonging to the six sub-sectors, with the exception of some of the state run companies, foreign capital affiliates, and companies of powerful financial groups, are mostly small or medium sized enterprises or cottage industries and would find it difficult in most cases to resolve the problems on their own due to financial limitations and limited capabilities. In such cases, positive guidance and assistance from Government Ministries and Agencies and public organizations would be essential.

Figure 5-7-1 briefly summarizes the issues and measures in promoting the six sub-sectors. That is, the R and D Institutes under the Ministry of Industry are in a position to take a central role in assisting the resolution of problems faced by private enterprise in areas like raw materials, facilities, human resources, technology, and management and in strengthening and aiding the competitiveness of industry. In this case, it will be most important to aim at roles such as the provision of services and assistance tailored to the needs of private enterprise so as to help private companies in the true sense of the word. With this basic concept in mind, this program has been recommended for strengthening and vitalizing the functions of the R and D Institutes.

**Fig. 5-7-1: Issues for Industrial Development and Functions of Public R&D Institutes**



## 2) Situation and Issues of Institutes

As of June 1991, there are 24 Institutes under the Ministry of Industry, controlled by the BPPI (Agency for Research and Development on Industries) (see Fig. 5-7-2). The 24 institutes may be broken down into the following:

- Central Institutes: 9
- Local Institutes (Testing Laboratories): 15

Among the 15 local institutes, the four in Padang, Tanjung Karang, Pontianak, and Samarinda were established most recently. The previous provincial Institutes in Medan, the Textile Institute and the Metal Institute, were absorbed into the Ministry of Industry. The institutes are listed by region in Table 5-7-1. Further, the present situation of the Central Institutes under the Ministry of Industry, which are in charge of the six sub-sectors, is summarized in Table 5-7-2 and the Institutes under other Ministries and Agencies are given in Table 5-7-3. Further, as of June 1991, preparation is underway for the establishment of a new local institute in Irian Jaya.

Fig. 5-7-2: Organization Chart of the Ministry of Industry

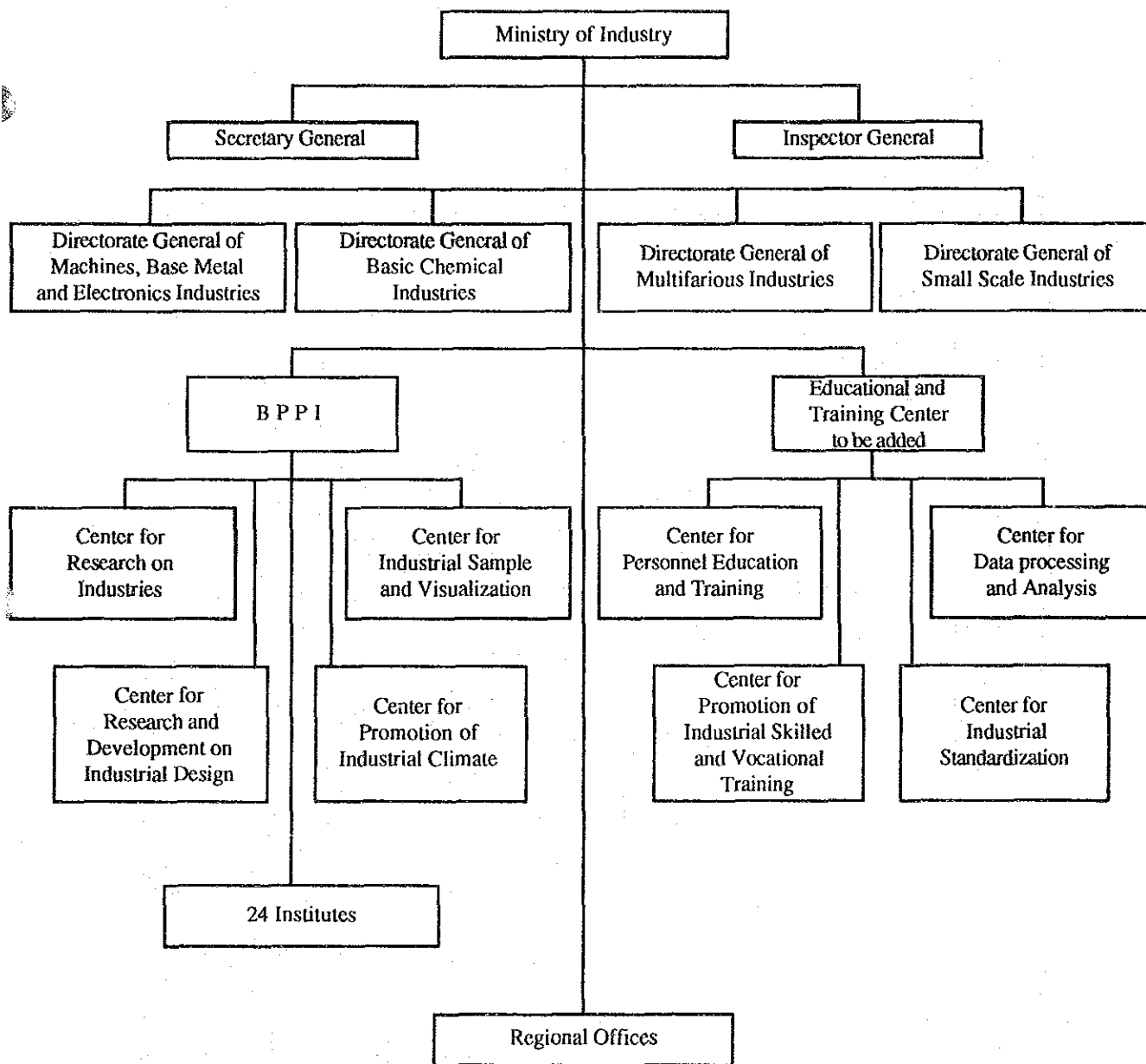


Table 5-7-1: Location of Institutes of Ministry of the Industry and Provincial Government by Region

Province	City	Central Institutes	Industrial Testing Laboratories	Provincial Testing Laboratories
Jawa (14)	Jabotabek	Jakarta	• IRDCI	• Provincial Testing Laboratory for Handicraft • Provincial Testing Laboratory for Construction Materials • Provincial Testing Laboratory for Textile Industry
	West	Bogor	IRDABI	
		Bandung	• IRDMMI • IRDMTP • IRDCRI	
	Central	Yogyakarta	IRDITI IRDCLI • IRDLAI • IRDHBI	
East	Sumarang Surabaya		• Industrial Testing Laboratory, Sumarang • Industrial Testing Laboratory, Surabaya	
Sumatra (7)	North	Aceh	Industrial Testing Laboratory, Aceh	
	Medan		• Industrial Testing Laboratory, Medan • Testing Laboratories for Metal Industry, Medan Testing Laboratories for Textile Industry, Medan	
		West South	Padang Palembang Tanjung Karang	Industrial Testing Laboratory, Padang • Industrial Testing Laboratory, Palembang Industrial Testing Laboratory, Tanjung Karang
Kalimantan (3)	West	Pontianak	Industrial Testing Laboratory, Pontianak	
	East South	Samarinda Banjarbaru	Industrial Testing Laboratory, Samarinda Industrial Testing Laboratory, Banjarbaru	
Sulawesi (2)	North	Manado	Industrial Testing Laboratory, Manado	
	South	Ujung Pandang	Industrial Testing Laboratory, Ujung Pandang	
North East Indonesia (1)		Ambon	Industrial Testing Laboratory, Ambon	

(N.B.) Institutes with • mark indicate those institutes related to the six sub-sectors surveyed.

**Table 5-7-2: Outline of Central R&D Institutes under the Ministry of Industry Related to the Sub-sectors**

Name of Institutes	Abbreviation in English	Abbreviation in Indonesian Language	Location	Year of Establishment	Major Activities	Specific Activities	Related Sub-sectors
1. Institute for Research and Development of Metal and Machinery Industries	IRDMMI (MIDC)	BBLM	Bandung	1969	Research and development, promotion of standardization, human resource development for ferrous, non ferrous metal, electric machinery and general machinery	1. Casting, Heat Treatment 2. Design of machinery, mechanical engineering	Electrical machinery Aluminium downstream products
2. Institute for Research and Development of Material and Technical Products	IRDMTP	BBBT (B4T)	Bandung	1909	Test and inspection of material and technical goods, calibration	1. Quality assurance of steel structure 2. Diagnosis and surveillance of industrial plant	Electrical machinery, Aluminium downstream products, Rubber-based products
3. Institute for Research and Development of Chemical Industries	IRDCI	BBIK	Jakarta	1938	Research and development and technical assistance related to chemicals, pharmacy, plastic products and packaging	1. Development of pesticides 2. Packaging technology	Plastic products
4. Institute for Research and Development of Leather and Allied Industries	IRDLAI	BBKPP	Yogyakarta	1927	Research and development and technical assistance for leather, rubber and plastic products	1. Tan & finishing of leather 2. Production technology of foot wear 3. Rubber and plastic products as a substitute of leather	Rubber-based products Plastic products
5. Institute for Research and Development of Ceramic Industries	IRDCRI (CRDI)	BBK	Bangdung	1922	Research and development, technological guidance for ceramics, glass and refractory industries	1. Development of building materials from clay, cement derivative and lime, especially for public housing 2. Industrial technology for fine and artistic ceramic 3. Technology of making ceramic insulator, refractory, special ceramic and glass	Ceramic products
6. Institute for Research and Development of Handicraft and Batik Industries	IRDHBI	BBKB	Yogyakarta	1957	Research and development, technical assistance, improvement of design for handicraft and batik industries	1. Improvement of quality of material 2. Improvement of production process 3. Development of production machinery	Handicraft

**Table 5-7-3: Related Research Institutes under Other Ministries**

Names of Institutes	Abbreviations	Administration	Locations	Industrial Sub-sectors Covered
Agricultural Research Institute, Bogor	BPPB (RIEC)	Ministry of Agriculture	Bogor	Rubber-based Products
Agricultural Research Institute, Sungei Putih	BPPSP (RIEC)	Ministry of Agriculture	Sungei Putih (Medan)	Rubber-based Products
Agricultural Research Institute, Sembawa	BPPS (RIEC)	Ministry of Agriculture	Sembawa (Palembang)	Rubber-based Products
Testing & Quality Control Center	PPMB	Ministry of Trade	Ciracas (Jakarta) Medan Pontianak	Rubber-based Products
Pertamina Institute	PPMP	Ministry of Mining and Energy	Pulo Gadung (Jakarta)	Plastic Products
Mineral Technology Development Center	PPTM (MTDC)	Ministry of Mining and Energy	Bandung	Ceramic Products
Electric Power Research Center	LMK-PLN	Ministry of Mining and Energy (State Enterprise for Electricity)	Jakarta	Electrical Machinery

The main tasks of the Institutes of the Ministry of Industry, however, are [1] testing and inspection (for industrial standardization etc.) and calibration of weights and measures, [2] research and development, [3] research and development regarding industrial waste, [4] technical services for small and medium sized businesses, and [5] exchanges of information and joint research with foreign institutes. If seen from an organizational viewpoint, they are provided with [1] a general affairs department and research and development center, [2] laboratories, [3] work shops, and [4] libraries. The Central Institutes specialize in industry, while the Local Institutes or Testing Laboratories specialize in resolving problems of regional industries and testing local products.

There are problems, however.

First, as shown in Table 5-7-2, Institutes established a long time ago have mostly antiquated production facilities and testing and inspection equipment and cannot keep up with the rapid development of industry which has occurred in recent years. Therefore, they have difficulty in providing useful, on-the-mark services to private companies.

Second, mention may be made of the insufficient number and quality of engineers in the Institutes. One of the reasons for this insufficiency is said to be the difference in salaries paid to the public and private sectors, in addition to the antiquated state of facilities.

Third, in many cases even the Central Institutes supposed to specialize in certain industries do not cover all areas of the industries concerned (see Table 5-7-2).

Fourth, the Institutes are concentrated in certain regions and are not located commensurate with the regional distribution of private companies in most cases. Also, there is insufficient linkage between the Central Institutes and the Local ones and so services cannot be provided covering wider areas.

Fifth, the Institutes sometimes cannot supply services to private companies necessity of which is increasing rapidly due to shortage of working capital and operation fund.

Overall, there is a problem in that the Institutes do not play a sufficient role in improving the level of technology of private enterprises. It is necessary to ask what should be improved so as to help the private sector.

## **2 Detailed Content of Program**

In the promotion of the six industrial sub-sectors, the Institutes of the Ministry of Industry will play central roles in the public system of support. The five sub-sectors other than handicrafts are all relatively young industries in Indonesia and it is considered that as the industries develop in the future and increase exports, the needs of private businesses with respect to the Institutes will become greater. Therefore, it is necessary that the Institutes will work to resolve the above issues and augment their functions so as to be able to meet the growing needs of private enterprises.

Detailed recommendations on the measures for augmenting and strengthening the functions of the Institutes in the six sub-sectors are made in the individual sub-sector reports. Here, a summary of the same will be given along with mention of the relationship with other priority programs.

### **(1) Handicraft**

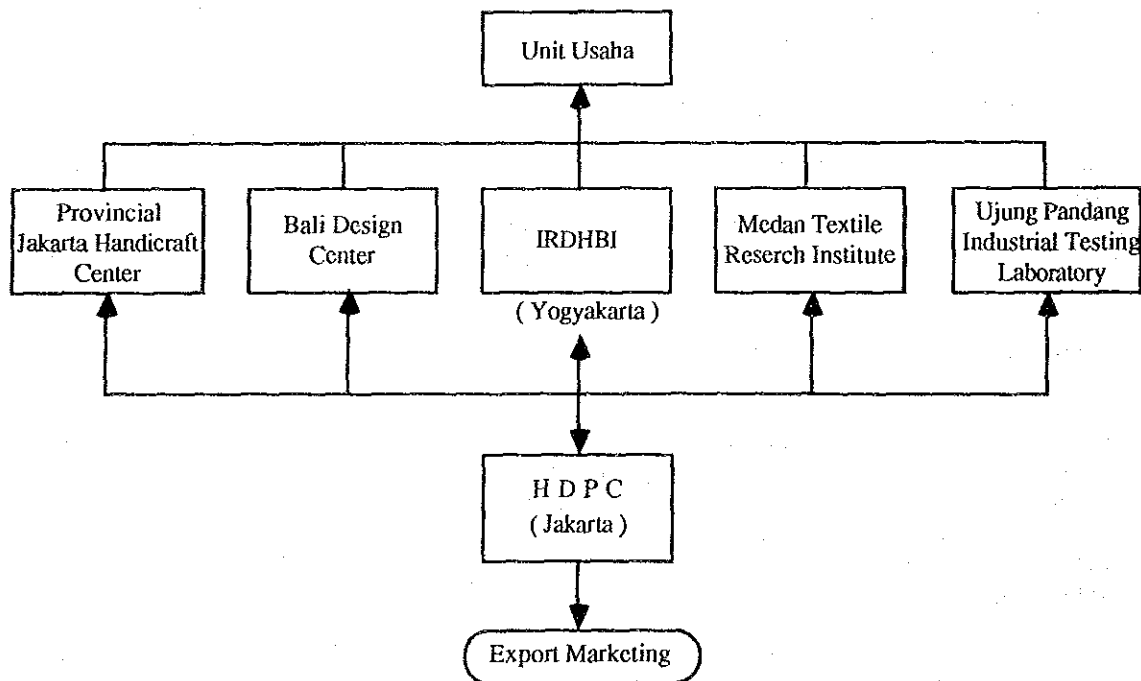


Indonesia is known throughout the world as a "treasurehouse of handicraft". To bring about stable increase in exports of handicrafts to the advanced countries, it is necessary to [1] strengthen export marketing and [2] improve production technology. Recommendation is made in this survey of the concept of a "Handicraft Development and Promotion Center" (HDPC) as a program for promotion of these two functions on a national level (see separate section on HDPC program). The Institute under the Ministry of Industry having jurisdiction over handicraft is the Institute for Research and Development of Handicraft and Batik Industries (IRDHBI, BBKB, in Yogyakarta). A plan was discussed to develop the Institute as the HDPC, but the conclusion may be drawn that the HDPC will be located in Jakarta or Jabotabek in view of the access to foreign buyers etc. at these places.

The IRDHBI will therefore perform the function of a local Institute under the HDPC, but it will lose nothing of its importance. Specifically, handicraft making businesses are small in size or cottage industries and are widely distributed throughout Indonesia, but the main production areas are in Jakarta, West Java, Bali, Central Java, North Sumatra, and South Sulawesi. Therefore, it is considered wise to locate handicraft institutes at centers like Jakarta, Denpasar, Yogyakarta, Medan, and Ujung Pandang so as to enable them to provide technical and managerial guidance to the regional industries and to handle the export marketing etc. through the HDPC in Jakarta. Further, it will be important to adopt promotional measures compatible with those of Institutes of other Ministries and Agencies and Provincial Institutes.

This is illustrated in Fig. 5-7-3.

**Fig. 5-7-3: Relation between HDPC and Existing Institutes**



The Institutes and other local laboratories will be equipped with the materials and equipment necessary for assisting in technical guidance in materials, design, and production to the private sector, overseas experts will be invited, and training will be offered inside and outside of Indonesia. Further, travelling technical guidance will be offered to private enterprises. Efforts will also be directed into the collection and supply of overseas information.

## (2) Rubber-based Products

This sub-sector is served by such Institutes as the Bogor, Palembang, and Sungei Putih Rubber and Agricultural Institutes, the Testing and Quality Control Center of the Ministry of Trade, the Institute for Research and Development of Leather and Allied Industries (IRDLAI, BBKPP) under the Ministry of Industry in Yogyakarta, and the Institute for Research and Development of Material and Technical Product Industries (IRDMTP, B4T) in Bandung. Further, there are research facilities for rubber products in the local institutes under the Ministry of Industry in Palembang and the Indonesian Export Training Center under the Ministry of Trade (in Jakarta). Raw materials for rubber are produced on the three islands of Sumatra, Java, and Kalimantan, but the production areas for rubber products are concentrated in Jakarta, Bogor, Bandung, and Medan.

Giving full consideration to this regional distribution of the industry, the production process from the raw materials to final products and method on how to export, the services of the Institutes in Jakarta, Bogor, Bandung, Yogyakarta, Medan, Palembang, and elsewhere have to be strengthened. The IRDLAI originally was established as an institute for footwear, so currently is not equipped with the materials or equipment commensurate with the rapid growth shown by rubber products and plastic products industries. The materials and equipment of the Institutes in the above five locations will be strengthened and augmented so as to be appropriate for the development of the non-footwear rubber product industry and, also, transfers of technology from advanced countries will be promoted through engagement of overseas experts and overseas training of experts from the public and private sectors of Indonesia. The compatibility with the concept of the High Polymer Center proposed in section 5-10 may also be recommended.

## (3) Ceramic Products

The Institutes having jurisdiction over ceramics include the IRDCRI of the Ministry of Industry (having jurisdiction over final products) and the Mineral Technology Development Center (MTDC, having jurisdiction over mineral resources) of the Ministry of Mining and Energy. In addition, the Directorate of Mineral Resources of the Ministry of Mining and Energy has set up a three party conference in Bandung for exchanges of information and joint projects. In the ceramic industry, it is important that promotional measures be comprehensive and cover everything from the raw materials to the final products. For the raw materials sector, in view of the need for resource surveys, a program for the same was recommended (5-8). In the product field, it is necessary to strengthen the functions of the IRDCRI. In particular, it is necessary to strengthen and augment the services provided to private businesses and to develop human resources by equipping the Institutes with testing and inspection equipment, production facilities, and other equipment, inviting overseas experts, and providing overseas training.

## (4) Electrical Machinery and Aluminium Products

A program for strengthening the Institutes dealing with the metalworking industry, common to the two sub-sectors, has already been recommended in Program 5-1. Here, recommendations will be made regarding the Institute for Research and Development of Material and Technical Product Industries (IRDMTP, B4T, in Bandung). This Institute is

one with a long history, having been established in 1909, but most of its testing and inspection equipment is antiquated. It is most used for nondestructive testing, or NDT. According to a department head in the Ministry of Industry, this service alone generates 1.4 billion rupiah a year in revenue from the private sector (actual expenses of service and fees). It is recommendable that such services fully utilized by the private sector be strengthened and other functions be converted decisively to functions in greater demand in the private sector through a scrap-and-build approach. The Ministry of Industry will prepare measures for dealing with this matter.

#### (5) Plastic Products

The Institutes of the Ministry of Industry in charge of plastic products include the IRDCI in Jakarta and the IRDLAI in Yogyakarta. The concept of High Polymer Center, dealing also with rubber products, is recommended in Program 5-10. According to this concept, necessity of inspection and testing, industrial standardization and development of engineers for high polymer materials and products will be studied to define feasibility of High Polymer Center. The Pertamina Institute and programs and projects now being implemented or planned will be studied as offering services appropriate for the needs of private enterprises. The strengthening and augmentation of the two Institutes, IRDCI and IRDLAI, will constitute part of this Program.

#### (6) Increase in Service Revenues of Institutes and Site Considerations

[1] Consideration will be requested for strengthening of financial background when the Institutes are expected to contribute the development of private companies. In order to do this, the Institutes will be supposed to try to increase service revenues. Some are already accomplishing good performance. All of them are expected to expand services of inspection and testing and contract R&D with private companies to increase the revenues.

[2] The Institutes do not, overall, correspond with the needs of current and future development of export oriented industries in either the industries or regions covered. Further, with some exceptions (ceramics), the system of cooperation with Institutes of other Ministries and Agencies is insufficient. It is necessary to re-organize the functions so that the industrial and regional coverage are appropriate for the regional spread of the industries concerned based on the Study by the Asian Development Bank (ADB). In this case, a study will be made considering also the roles of the Institutes of other Ministries and Agencies as well.

### 3 Measures Urgently Requiring Implementation

(1) In this program, it is judged desirable to start first with the strengthening of the IRDLAI for rubber products and the IRDCRI for ceramic products.

The reasons for this were described in chapter 2, that is, it is considered that industrial promotion and export growth can be achieved in the near future in both sub-sectors, and, furthermore, other sub-sectors would be covered by other Priority Programs, including measures for strengthening the related Institutes. Specifically, electrical machinery and aluminium products will be covered by the Program for Development of Metalworking Technology, based on the IRDMMI (5-1), and recommendation is made that top priority be given to that Program. Further, handicrafts are covered by the Handicraft Development and Promotion Center (HDPC) program (5-9) and plastic products by the High Polymer Center program (5-10). These Programs include a broader range of promotional measures including strengthening of the functions of existing Institutes.

(2) With regard to the strengthening of the IRDLAI for rubber products and the IRDCRI for ceramic products, the preferred Project to be implemented for the time being would be the augmentation of the testing and inspection functions and capabilities for development of human resources - for which there are tremendous need in private businesses. Looking at the testing and inspection functions, it is judged that the following testing and inspection equipment need to be provided. Looking at the capabilities for development of human resources, it will be desirable to give training to the technical staff in the Institutes so that they will be well acquainted with thus testing and inspection equipment and able to provide technical assistance to private enterprises. Toward this end, effective utilization of experts from overseas countries and also of overseas training for Indonesian engineers will be accomplished based on initiatives from the Ministry of Industry and its Institutes.

**Table 5-7-4: List of Testing and Inspection Equipment for Rubber-based Products to be Considered Necessary in the IRDLAI**

Raw Material Testing

- Plastmeter
- Air-oven Aging Tester for PRI
- Draft Chamber

Compound Designing

- Top-Pan Electronic Balance
- Mixing Roll Mill
- Mooney Viscometer
- Rheometer
- Vulcanizing Press
- Surface Temperature Measuring Apparatus
- Mould

Processing Testing

- Internal Mixer
- Kneader
- Calender Roll
- Extruder
- Injection Machine
- Work Table

Physical Properties Testing

- Specimen Cutter
- Cutter
- Grinding Machine
- Band Knife Splitting Machine
- Micrometer
- Block Gauge
- Tensile Strength Tester
- Tensile Tester Calibration Equipment
- Oxygen Pressure Aging Tester
- Air-oven Aging Tester
- Test Tube Heat Aging Tester
- Micro Hardness Tester (IRHD)
- Hardness Tester JIS A and Shore D
- Hardness Tester Calibration Unit
- Permanent-set Tester
- Resilience Tester
- Impact Brittleness Tester
- Gehman type Torsion Tester
- Ozone Weathering Tester
- Relaxometer
- Weathering Tester
- Color Meter
- Indentation/Compression Force Deflection Tester
- Load Cell Type Universal Tester
- Compression Tester
- Abrasion Tester
- Automatic Densimeter

### Product Testing

Bursting Tester  
Crease Flex Tester  
Waterproofing Tester  
Hose Bursting Tester  
Microscope

### Chemical Analysis

Water Distillation Unit  
Analytical Balance  
Thermal Analyser  
Muffle Furnace  
Furnance  
Ultrasonic Cleaner  
Infrared Spectrophotometer  
UV/VIS Spectrophotometer  
Gas Chromatograph with Pyrolyzer  
High Performance Liquid Chromatograph  
Atomic Absorption Spectrophotometer  
X-Ray Fluorescence Spectrophotometer  
Thin Layer Chromatgraph  
Laboratory Practice Table

### Latex and Latex Product Testing

Constant Temperature Oven  
Viscometer  
Mechanical Stability Measuring Apparatus  
Small Type Dipping Machine  
Small Type Maturation Vulcanization Machine  
Tension Tester

**Table 5-7-5: List of Testing and Inspection Equipment etc. for Ceramic Products to be Considered Necessary in the IRDCRI**

(1) Testing and Inspection Equipment

1	High Temperature Gas Furnace, 02M <sup>3</sup>	2 sets
2	Electric Kiln Max. 1600°C Max. 1200°C	2 sets each
3	Viscosity Meter	2 sets
4	Compressive Strength Testing Machine Max. 100t	1 set
5	Electronic Precision Balance 100g, 200g, 500g	3 sets each
6	Infrared Moisture Determination Balance	1 set
7	Digital Ion Meter	2 sets
8	Hot Magnetic Stirrer	2 sets
9	Mixing Stirrer	2 sets
10	Air Oven	1 sets each
11	Fine Mortar Grinder Pressurized type, using alumina mortar	1 set
12	Mortar Grinder 200~250	4 sets
13	Finishing Jigger	2 sets
14	Vacuum Slip Tank	1 set
15	High Speed Ship Agitator	1 set
16	Firing Kiln 0.5 M <sup>3</sup> 1200°C Shuttle Kiln 1 M <sup>3</sup> 1400°C Shuttle Kiln 0.3 M <sup>3</sup> 1700°C Shuttle Kiln	2 sets 2 sets 1 set
17	Electric Kiln 1M <sup>3</sup> 1000°C	1 set
18	Vacuum Agitator for Gypsum Plaster	1 set
19	Original Mould Jigger	1 set
20	Finishing Jigger	1 set
21	Wet Pan Mill	1 set
22	Wet Pan Mill	1 set
23	Grinding Mill	1 set
24	Screen	1 lot
25	Mechanical Jigger	4 sets
26	Spare parts (for two to three years)	1 lot
27	Other Laboratory Tools	1 set

(2) Equipment for Training

1	Roll Crusher	1 set
2	Jaw Crusher	1 set
3	Ball Mill With alumina inner liner and alumina ball	
	500 kg	2 sets
	300 kg	2 sets
	100 kg	3 sets
	50 kg	3 sets

4	Vibration Screen	2 sets
5	Magnetic Ferrofilter	4 sets
6	Agitator	2 sets
	Portable Agitator	2 sets
7	Ship Pump	1 set
8	Filter Press with diaphragm Pump	2 sets
9	Vacuum Extruder	1 set
10	Automatic Cutter	2 sets
11	Automatic Jigging Roller Machine	2 sets
12	Mangle Type Dryer with Hot Air Generator	1 set
13	Sieve Shaker with Screen	2 sets
14	Vacuum Pump and Desiccator	1 set
15	Stamp Mill	2 sets
16	Refractoriness Tester	2 sets
17	Other Chemical Analysis Equipment, Reagents, Parts etc.	1 lot



(3) In implementing the Projects of the above (1) and (2), it would be desirable to study the following points from the viewpoint of strengthening the functions of the Institutes in contributing to the development of private enterprises:

[1] Increase of Service revenues

Testing and inspection services provided to private enterprises and R&D done on contract from private enterprises will be increased so as to boost revenues from these services. This could be expected to strengthen the financial standing of the Institutes and also contribute to obtaining a better grasp of the needs of private businesses.

[2] Location of Institutes

IRDLAI, which covers rubber products, is located in Yogyakarta, while IRDCRI, for ceramic products, is located in Bandung. Companies manufacturing these products, however, are widely spread in different areas. Consideration will be given to strengthening the system of services the network of local Institutes so as to enable businesses located away from the Central Institutes to make use of their services.

## **5-8 Program for Survey of Resources of Ceramics Raw Materials**

### **1 Background and Objectives of Recommendation**

#### **1) Background**

In the ceramic industry, which is a material type industry, it is extremely important to secure stable supplies of good quality materials in trying to increase production and improve quality of products. In the production of ceramics, the quality of the final products is affected to a large extent by the mineral composition, chemical composition, structure, properties, and other aspects of the materials used. Unless high grade, stable quality materials are secured and all the processes from the treatment and refinement to the mixing and processing are fully controlled, it is not possible to stably manufacture high quality products. Therefore, the establishment of a system for the supply of large amounts of low priced, good quality domestic materials may be said to be an essential requirement for the promotion of the ceramic industry. However, the ceramic materials produced in Indonesia suffer from problems in the grade and stability of quality and also in the smoothness of supply. This has become one of the factors limiting the development of the products manufacturing sector. In particular, there are large problems in the tableware and novelty manufacturing sectors.

Looking at tableware, porcelain ware in particular requires high grade materials. The situation is such that companies making high grade products such as export goods are forced to use high priced imported materials. Some companies use cheap domestic materials, but the products of these companies are inferior in whiteness and transparency of body and the quality of high class goods cannot be secured. Stoneware can be made using primarily domestic materials. However, even those manufacturers are troubled by the quality of the materials and the instability of the supplies. Novelty manufacturers face similar problems. Those companies manufacturing porcelain ware and other high class export goods are forced to import prepared body from abroad for their manufacturing operations. Manufacturers of export sanitary ware also rely on imports of raw materials such as ball clay. With tiles, the grade of the material is not called in question that much and, further, as a product which would be difficult to make use of high grade materials due to cost factors, so tiles are manufactured primarily using domestically produced clay materials. This does not mean, however, that there are no problems. Manufacturers making products for the domestic market tend strongly to use only a single type of material in their production. The quality of the material varies with each shipment received, so there is trouble with problems in shape such as torsion and bending and differences in the dimensions of the products made. It is necessary to secure many types of materials and improve the mixing technology. This necessitates a diversification of the supplies of domestic materials and stabilization of quality.

In view of this situation, major issues to be tackled are the strengthening of development of resources of materials, promotion of technology for mining, sorting, processing, treating, and mixing of the materials, and ensuring smooth distribution.

#### **2) Objectives**

In particular, it would be indispensable to continuously implement survey and development of resources of raw materials, as it is deemed to be prerequisite for tackling issues faced by Indonesian ceramics industry.

Indonesia has been generally slow in developing its resources of ceramic materials. Most of its resources remain unassessed and unexploited and thus are not being effectively used. The reasons for this are that [1] the main production areas are spread out in the local regions, [2] the road network, in particular the local routes, is not well

established, creating major problems in access to mine beds. Moreover, [3] there have been insufficient comprehensive, systematic surveys made of the resources and thus there is insufficient data, and [4] due to the lack of surveys on underground mine beds in particular, development are limited to the easily mineable surface areas, meaning underground resources are not utilized much at all. In other words, there is a shortage of resource surveys and development activity.

Therefore, it is recommended that samples of materials as well as a broad range of data on the state of resource reserves, the infrastructure, and surrounding related industries be collected and that full scale surveys and studies be started urgently regarding feasibility of development and methods of it.

### 3) Expected Effects

The development of resources of ceramic materials could be considered to have the following broad effects:

[1] Promotion of the material industries and stimulation of the economies and promotion of employment in the local areas

[2] Import substitution of materials and promotion of exports of the same so as to contribute to improvement of the balance of payments

[3] Expansion and stabilization of production, improvement of quality, and reduction of manufacturing costs in the ceramic products manufacturing industries. In particular, effects are considered to be very great for small and medium sized manufacturers who find it difficult to secure stable supplies of materials

## 2 Detailed Content of Program

### 1) System of Implementation

It is necessary to develop resources by a suitable method after establishing clear goals for industrial promotion and sufficiently verifying the feasibility. Also, needless to say, it is necessary to consider the preservation of the environment. Therefore, the surveys must be run from comprehensive angles. It is recommended that the functions of the Directorate of Mineral Resources (DMR) and the Mineral Technology Development Centre (MTDC) of the Ministry of Mining and Energy, the Institute for Research and Development of the Ceramic Industry (IRDCRI) of the Ministry of Industry, and other related organizations be broadly mobilized and that the surveys be run with coordination among those organizations. Full-scale cooperation of the Industrial Mineral Association and the Indonesia Ceramic Association and the companies under them in the form of provision of samples of materials and related information would also be an important factor leading to the success of the surveys. Also, it is recommended that technical cooperation be received from foreign research and development organizations at the stage where findings have been obtained from the surveys to a certain extent.

The DMR, MTDC, and IRDCRI jointly launched a working group in December 1990 and have begun research on the utilization of industrial minerals and industrialization of the same. The research is aimed at practical application and future plans call for participation by the industrial circles as well. In promotion of the surveys, it is desirable that the working group take on the core role for storing information and coordinating activities, that it set targets for the promotion of the ceramics industry, give directions to development of resources based on the same, conduct feasibility studies and provide assistance in information and technical aspects to private development projects.

The three organizations would generally be responsible for the following areas of the work in the working group and field surveys:

- DMR:** Geological surveys, grading technology, and environmental preservation (seeking cooperation from the Geological Research and Development Center and the Directorate of Environmental Geology of the Directorate General of Geology and Mineral Resources )
- MTDC:** Mining technology, processing and refining technology for minerals, environmental preservation, development of mineral products, development of local mining industries
- IRDCRI:** Physical and chemical evaluation, technology for improving quality of materials, feasibility studies relating to application of the same

## 2) Outline of Survey Plans

### (1) Subject of surveys

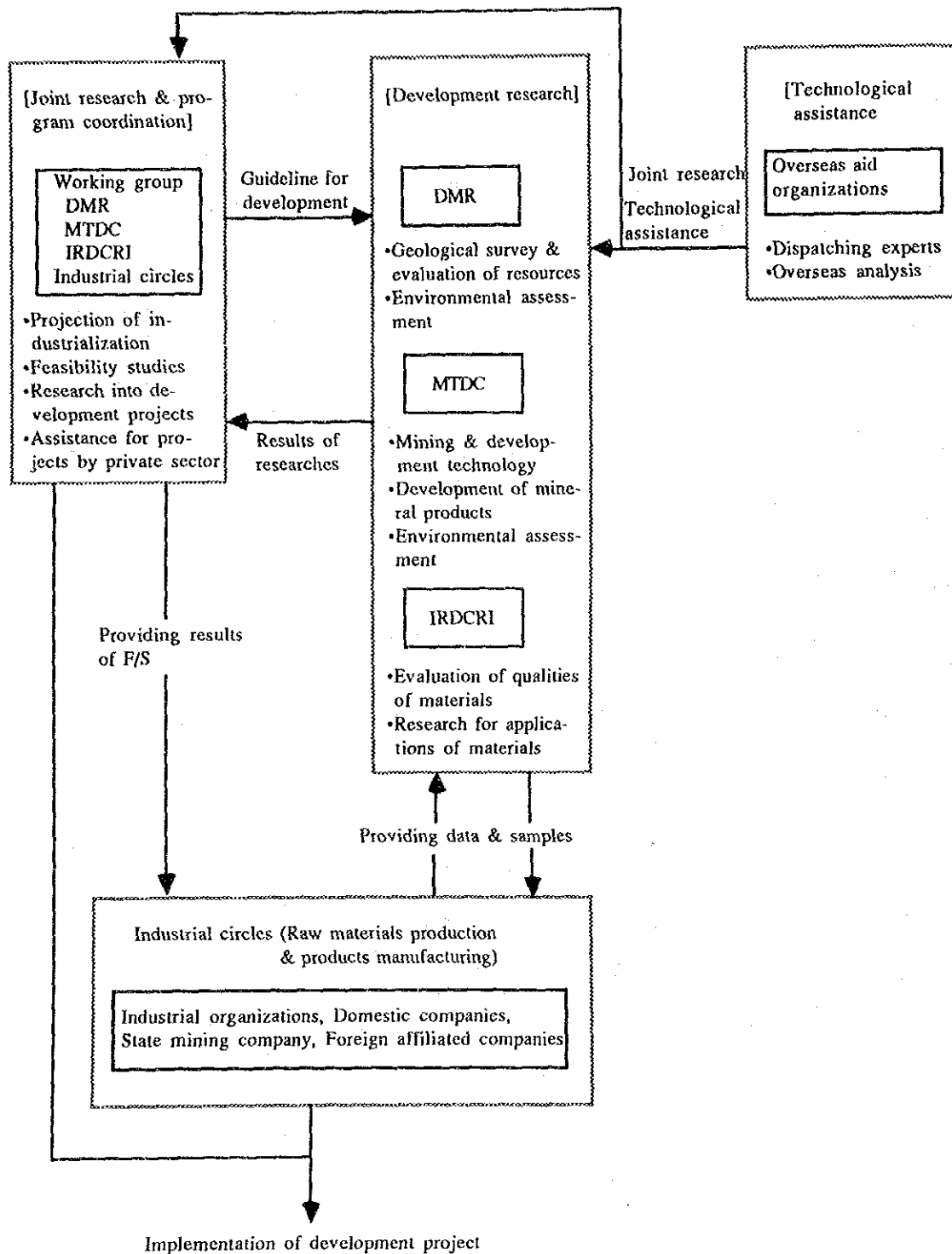
The items surveyed would include kaolin, plastic clay, feldspar, pottery stone, pyrophyllite, silica, gypsum, magnesite, dolomite, etc. Of high priority among them are kaolin, (redevelopment of underground resources of Bangka Island and Belitung Island, Sumatra Island, western part of Kalimantan, etc.), feldspar (redevelopment of underground resources of Lodoyo in East Java and Kawarusa silica sand of east coast of Sumatra Island, etc.), for which demands are great and pottery stone (of which good quality supplies have not yet been discovered).

### (2) Method of Surveys

The size of the surveys should be expanded step-by-step in accordance with the following stages:

- First stage:** Samples of typical raw materials of different areas will be collected and tested (firing tests, chemical analysis) so as to verify the possibility of utilization and data such as on the production locations, topology, road situation, method and ease of development, and relation with neighboring industries will be collected and studied, thus promising mine beds will be found. The term will be approximately one and a half to two years.
- Second stage:** Test digging at promising mine beds and testing of quality of materials samples and feasibility studies will be conducted intensively. The term will be about one year.
- Third stage:** Formulation of plans for exploitation of mine beds showing feasibility (with stable grades, sufficient reserves, and suitable development costs). Promotion of participation of private sector and state run companies in development. The term will be about one and a half years.

Fig. 5-8-1: Flow Chart (Draft) for Survey of Resources and Development Projects



### **3 Measures Urgently Requiring Implementation**

#### **(1) Creation of System for Promotion of Program**

It is recommended that the Ministry of Mining and Energy, the Ministry of Industry, the various research and development institutes, and the industrial circles establish a council for the promotion of resource development which would study and formulate survey plans, methods of implementation, and division of works. The above-mentioned working group would serve as the center of this council.

#### **(2) Introduction of Foreign Technology**

The first stage of the surveys would be performed at the initiative of the Indonesian side, but at the second and third stages it is considered effective to engage overseas experts to provide technical assistance. One expert each would be required for the fields of geology, ceramic materials (inorganic materials engineering), resource development, and development of ceramic products. It would be desirable that a system be organized enabling comprehensive, organic technical assistance to be provided in the form of survey teams. Assistance from overseas testing and research organizations would have to be considered for the tests of samples. It is considered that about two months each would be required for the field surveys at each stage.

### **4 Related Programs: Smoothing Distribution of Materials**

Important issues in the materials sector, in addition to strengthening development of resources mentioned above, would be the improvement of refining and processing technologies and the smoothing of distribution.

Regarding the improvement of the refining and processing technology, it is recommended that joint roving guidance by the MTDC and IRDCRI be strengthened.

In the area of distribution of materials, it is recommended that a "raw and auxiliary materials estate" as a comprehensive center for collection and distribution of materials be constructed at a suitable location of Java Island, a center of demand for materials, as a fundamental method of smoothing distribution. It would be effective if the estate were given the comprehensive functions of [1] the collection and distribution of raw materials produced throughout the country (preparing and mixing materials in accordance with need) and also [2] the manufacture and sale of various types of auxiliary materials (attracting manufacturers of auxiliary materials) and [3] the sale of imported raw and auxiliary materials. In terms of location, it is considered that Central Java would be most suitable place. Central Java is located in the middle of the triangle connecting the three regions of the two cities and surrounding regions of Jakarta and Surabaya, where there are many manufacturers of finished products, and Bandung, where research and development institutes are located.

Manufacturers of ceramic products are very interested in this program, therefore, preferably consideration should be given to it from a long term perspective so that it may be realized. It is hoped that the industrial associations and the raw material producers and products manufacturers under them would take the initiative and that the related ministries and public research and development institutes would understand the concept and cooperate with industrial circles.

## 5-9 Program for Handicraft Development and Promotion Center (HDPC)

### 1 Background and Objectives of Recommendation

#### 1) Background

Indonesian handicrafts are highly evaluated by knowledgeable persons for their ethnic attractiveness and richness and are also being exported. To further increase exports and start the exports of handicrafts currently not being exported, it will be necessary to establish an export marketing function, to raise the quality of the products, and to make product adaptations.

According to data from the Ministry of Industry, there are 117,019 unit of establishment belonging to the Sentra in the handicraft and the general industry. They employ a total of 280,578 people. Companies are extremely small as shown in the figure of employees per unit (2.4 persons) and annual value-added per employee (440,000 Rp.).

Field surveys of the study were conducted in the regions of Jakarta, North Sumatra, South Sulawesi, Bali, Yogyakarta and Bandung. The study team visited a total of 131 firms and related organizations. It also collected 184 responses to questionnaires. Handicrafts covered in the field surveys were hand-woven products (including silk products), anyaman made of bamboo and mendong, small rattan products, ceramic handicrafts, wooden products such as wood carvings (including pop art products), stone carvings and fashion accessories such as silver products, precious stones, stone accessories, brass products and shell products.

Problems found during the field surveys can be organized into two main categories, marketing and production technology. Problem in terms of marketing is the absence of marketing function.

The American Marketing Association defines marketing functions as the management of the flow of goods and services from manufacturers to consumers. Marketing activities include identification of consumer preferences, market surveys such as measurement of demand, market development, new product development, brand development, packaging, price setting, setting on sales channels and promotion such as PR. A strategy which integrates these functions is necessary.

However, it is difficult for small-scale firms or cottage-industry-level operations which account for most of handicraft industry to undertake marketing activities in this way due to shortages of funds and human resources.

In the field of production technology, problems include the lack or insufficient implementation of measures for upgrading quality and adapting products to overseas markets, which are required if Indonesian handicrafts are to be accepted in importing countries.

Production of high quality handicrafts requires technical guidance and implementation of quality control from raw material, production process to delivery. Product adaptation necessitates product development and development of design.

Typical problems in terms of production technology are shown as follows,

Hand-woven products

Color fading, defects in weaving resulting from poor preparation for looming and warping

Silk	Frequent yarn breakage resulting from reeling filament using water at room temperature
Bamboo crafts	Insufficient boiling of bamboos
Ceramic handicraft	Poor temperature control of kiln
Wood carving/wooden handicraft	Cracking due to insufficient drying of wood

Because of constraints of manpower and financial ability, small scale and cottage handicraft industries face difficulty in solution of these problems which needs quality control and technical guidance.

Handicraft development policy is implemented under the framework of the small scale industry development policy. UPT and TPL which constitute major policy measures fall short of requirements in view of the large number of businesses and the vast number of employees in the handicraft industry. Main public organizations related to handicraft industry are Institute for Research and Development of Handicraft and Batik Industries (IRDHBI), Bali Design Center and Jakarta Handicraft Center (PPDJ). Current state is shown by the following table.



Table 5-9-1: Major Public Institutes Related to Handicraft Industry

Name of organization	Location	Administration	Object	Overseas cooperation	State of activities, etc.
Institute for Research and Development of Handicraft and Batik Industries (IRDHBI)	Yogyakarta	Ministry of Industry	Research and development, testing, design development education and training in handicrafts and batiks	None	The center has a 5000 square meter building in which there are laboratories and training facilities for technical engineering and tests; a miniplant, library, and a design development section. There are 250 expert staff, of which 220 have obtained masters degrees. The center is comprised of a total of four divisions, including a batik and handicraft research division and development division, and engages in research and development, inspection, evaluations, and research and development of designs. It further works to disseminate the results of research and development through education and training programs, information services, consulting services, and technical assistance.
Bali Design Center	Denpasar	Ministry of Industry	Design development, wood products, metal products, textiles, plating, ceramics	None	The center is located in Bali, which enjoys excellent conditions as a production area for handicrafts. Cooperation is received from Udayana University.
Jakarta Handicraft Center (PPDI)	Jakarta	Jakarta City	Training of craftsmen of wooden work, bamboo, rattan and metal working	UNIDO	Located at Cilandak, south of Jakarta, Three workshops (wooden work, bamboo and rattan, metal working) and design center are established in 2ha size area. Number of staffs is 24. Handicraft compartment of KADIN is located in the building and cooperation is maintained between two organization.

## 2) Current state of handicraft export promotion policies

Export of handicrafts is promoted by NAFED as target item in the non migas export promotion policy. Export of handicraft has jumped up from 92.8 million dollars in 1984 to 859.3 million dollar in 1989.

Indonesia is successfully exporting handicrafts to Japan with the cooperation of JETRO with the NAFED since 1982. JETRO's export promotion project for handicrafts has been comprised of the following programs:

[1] Guidance for improvement of products: Samples are purchased and monitoring is performed to study if the products are suited to the Japanese market. Experts visit and provide guidance to the production floors of manufacturers based on the results of the monitoring studies.

[2] Trade development program: Experts in products and design are dispatched to provide guidance and recommendations.

[3] Export to Japan missions: Missions composed of representatives of government organizations and private enterprises are dispatched to Japan to hold business meetings and run market surveys.

[4] Import promotion missions: Import promotion missions are dispatched from Japan to exhibitions such as Resource Indonesia.

[5] Overseas market surveys: Overseas market surveys are run on Indonesian products, including in Japan.

The handicrafts covered have been as follows:

Fiscal 1982/83: Wooden products and textile products

Fiscal 1983/84: Ikat, rattan, and ceramics

Fiscal 1984/85: Textile crafts and ceramics

Fiscal 1985/86: Wooden household goods

Fiscal 1986/87: Gift items

Fiscal 1987/88: Fashion accessories

Fiscal 1988/89: Gift items

Fiscal 1989/90: Gift items and fashion related products

Fiscal 1990/91: Interior fashions

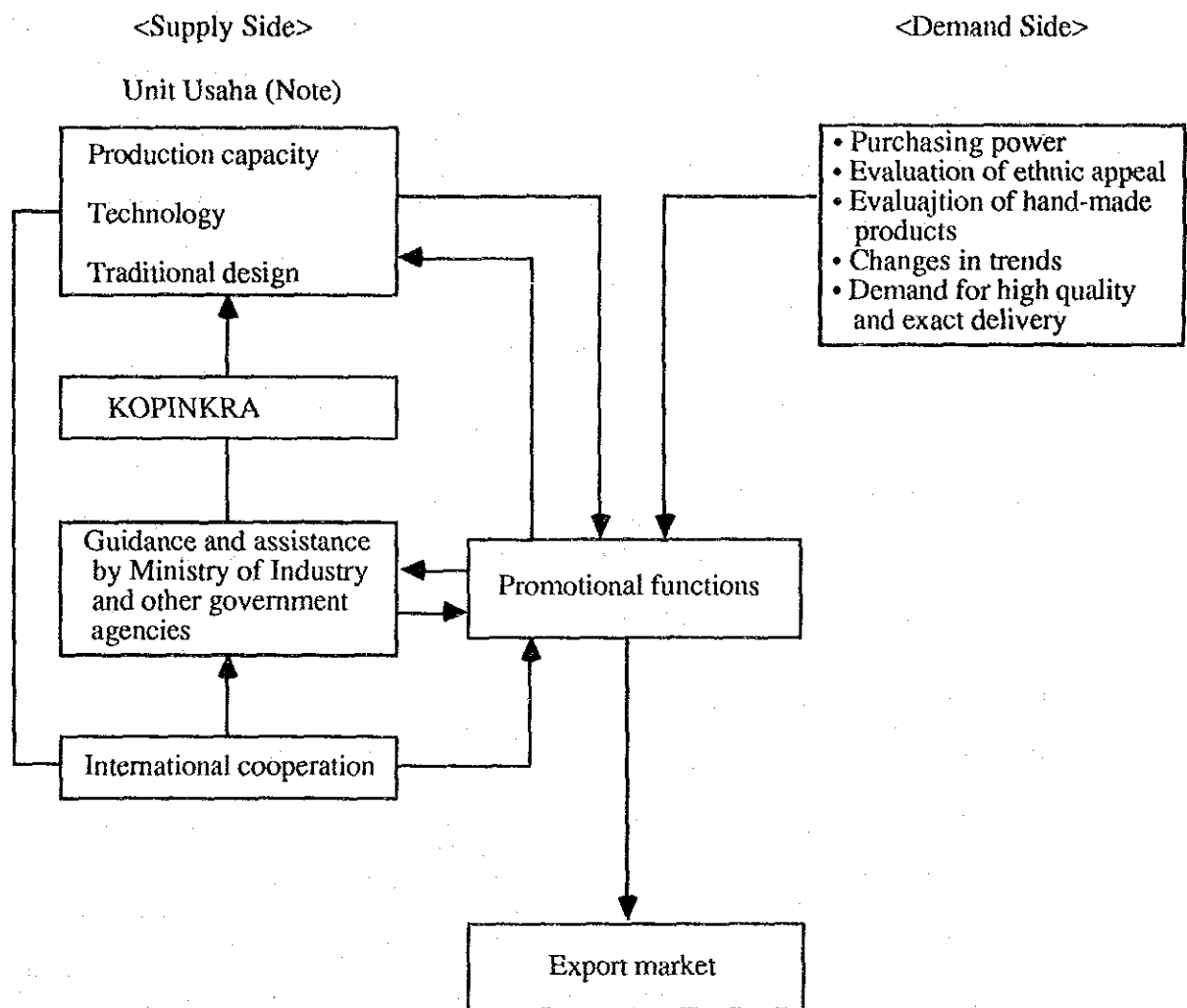
JETRO's programs of cooperation have been characterized by [1] coverage of a broad range of regions (Jabotabek, West Java, Central Java, East Java, North Sumatra, South Sumatra, South Sulawesi, Bali, Lombok), [2] guidance on the production floor level, [3] guidance by first line experts of the private sector, [4] integrated, overall cooperation from the production floor to the export markets, including technical guidance, provision of designs and assistance in export transactions with Japan.

## 3) Objectives

From the world perspective, Indonesia has numerous superior handicraft industries scattered throughout its territory and the possibilities for export are extremely great. Handicrafts are used in daily life in the producing country, but in the consuming countries handicraft trends change rapidly. To export such daily-use items, therefore, it is necessary to improve quality and adjust specifications to meet with the conditions, needs, and trends in the destination markets. Further, it is essential to engage in overall marketing - collecting market information, developing products, promoting sales, and

engaging in other forms of promotion. Therefore, in this program, it is necessary to establish a development and promotion function aimed at all handicraft products throughout Indonesia and directed at export marketing, improvement of quality, and product adaptation.

**Fig. 5-9-1: Scenario for Promotion of Exports from Small and Medium-scaled Handicraft Firms**



(Note) Unit Usaha means production units and business entities

## 2. Detailed Content of Program

The specific functions of the Handicraft Development and Promotion Center may be roughly divided into marketing related functions and production technology related functions.

The marketing related functions would be as follows:

- [1] Exhibition of handicrafts collected from throughout the country
- [2] Acquisition of information required for export and provision of same to exporters
- [3] Sponsoring of export meetings and reception of import missions from other countries
- [4] Agent services relating to export transactions
- [5] Provision of information to handicraft manufacturers
- [6] Guidance to handicraft manufacturing companies in marketing
- [7] Provision of information on preferences and trends in the importing markets
- [8] Selection of handicrafts suited for export to target markets
- [9] Business training
- [10] Dispatch of export missions
- [11] Overseas PR of Indonesian handicrafts

The production technology related functions would be as follows:

- [1] Technical guidance to handicraft manufacturers
- [2] Guidance in quality control to handicraft manufacturers
- [3] Guidance in use of machinery
- [4] Guidance in product adaptation
- [5] Provision of designs suited to target markets
- [6] Technical exchanges with related overseas handicraft organizations

All of these functions are important and should be implemented as a comprehensive program. Major private enterprises are already being provided with guidance and information on product development is already being supplied under the cooperation of JETRO. On the other hand, considering the location of the handicraft producers in distant regions of the country, their small scale of operations, and the resultant difficulty in export transactions, agent services related to export transactions would probably be the most advantageous to the cottage size handicraft businesses. In agent services related to export transactions, naturally such functions as exhibition, provision of information, and PR would be added. The examples of the Morioka Handiwork Square of Japan and Denparmanent of Denmark will be introduced in summary here as successful cases of such agent services. In operation, the Morioka Handiwork Square is run by a third sector approach with participation from the public and private sectors, while Denparmanent is operated on a private basis. In the case of Indonesia, due to the extremely small size of the handicraft manufacturers, the third sector approach with participation of public organizations would be suitable.

When establishing such a development and promotion center in Indonesia, consideration will probably be given to the Jakarta Handicraft Center in view of the site conditions and space. The chamber of commerce and industry is located at the same spot and there would be a greater chance of the private sector taking the lead in operations than with other facilities.

The Indonesian Export Training Center of the Ministry of Trade also has exhibition facilities and use of these would be considered. On the other hand, consideration may also be given to use of foundations having to do with handicrafts (Yayasan).

### 3 Measures Urgently Requiring Implementation

Even before the establishment of HDPC, the following functions [1] to [5] and [7] can be implemented at the present. These projects are desirably to be immediately initiated at the initiative of Ministry of Industry with the cooperation of Ministry of Trade, KADIN and overseas economic cooperation organizations. Project [6] is necessary to coordinate and effectively implement the separately prepared projects and make preparation to establish HDPC.

- [1] Guidance to businesses by experts for short-term periods and provision of information through seminars, etc.
- [2] Dispatch of export missions overseas
- [3] Reception of import missions from other countries and sponsoring of business meetings
- [4] Collection of samples and monitoring
- [5] Technical exchanges with overseas handicraft related organizations
- [6] Establishment of liaison council for promotion of development of handicrafts by Directorate General of Small Scale Industries, Jakarta Handicraft Center, Craft Center of NAFED, KADIN, and overseas cooperation organizations and strengthening of coordinated cooperation for the efficient, effective implementation of the program
- [7] Exchanges and cooperation between handicraft promotion staff (public and private) of Indonesia and promotional staff of local traditional handicraft products in Japan

An outline of the Morioka Handiwork Square and Denparmanent is presented as an example of a development and promotion center.

**Fig. 5-9-2: Outline of Morioka Handicraft Square and Denparmanent**

	Morioka Handiwork Square	Denparmanent
Established in:	1985	1931
Floorage	3,591m <sup>2</sup>	2,600m <sup>2</sup>
	Technology training room 450m <sup>2</sup>	Sales floor 1,500m <sup>2</sup>
	Hall 204m <sup>2</sup>	Warehouse 400m <sup>2</sup>
	Exhibition room for information 390m <sup>2</sup>	Packaging room 300m <sup>2</sup>
	Exhibition and sales room 542m <sup>2</sup>	Office 400m <sup>2</sup>
	Handicraft shops 7,155m <sup>2</sup>	
Staff	17	78
		Retail sales 31
		Administration 18
		Exports 13
		Interior design 4
		PR 4
		Packaging 8
Management	No. 3 sector (prefecture, city, chamber of commerce and industry, cooperatives)	Managed by members independent of other organizations
Capital	• Earnings through sales of displayed products (30 percent commission) • Subsidies	Earnings through consigned sales (27-40 percent commission)
Objectives	Promotion and development of local industry	Support for the handicraft industry through the formation of a sales organization. "Consumers do not want to go to the trouble of coming to the countryside to search for the works of craftsmen" (Kay Bojesen)
Functions	Information collection Survey and research Human resource development Sales promotion Exhibitions/PR	Exhibitions (permanent, special) (displayed products are selected by a committee) Information collection Information services (concerning handicrafts from around Denmark) Agent services for sales Agent services for exports Sales promotion Quality assurance labels

## 5-10 Program for High Polymer Center

### 1 Background and Objectives of Recommendation

To strengthen the international competitiveness of plastic products and rubber-based products industries, it is essential to have public Research and Development Institutes provide assistance in testing and inspection, since many small and medium sized private businesses lack the requisite testing and inspection equipment. Public research institutes in the two industrial sub-sectors include, under the Ministry of Industry, 1) the IRDCI (BBIK, Jakarta) and 2) the IRDLAI (BBKPP, Yogyakarta), 3) the Agricultural Research Institute, Bogor (covering rubber-based products) under the Ministry of Agriculture, 4) the Pertamina Institute under the Ministry of Mining and Energy, and 5) Oil and Gas Research and Technology Development Centre (LEMIGAS).

The IRDCI (in Jakarta) engages in a wide range of activities in the chemical industries, i.e., "research and development, testing, standardization, environmental preservation and training related to production technology, production processes, production management, raw materials, products, and production facilities for the development of chemical industries". However, with a few exceptions such as a spectrophotometer for ultraviolet rays and a gas chromatograph, most of the inspection and testing equipment now owned are outdated, or do not function properly. In addition, the IRDCI lacks specialized books, test use chemicals and implements, and other testing "infrastructure". Therefore, satisfactory inspection and testing activities are difficult. Further, the IRDCI covers the chemical industries as a whole in its endeavors. The proportion of its current activities and organization devoted to plastics and rubber is small and therefore the value of use to private sector plastic products manufacturers and rubber-based products manufacturers is considerably low at the present.

The IRDLAI (in Yogyakarta) engages in "research and development and the implementation of testing related to raw materials, production processes, products, and production facilities with a view to assisting in the development of the leather, rubber, and plastics industries", though more emphasis is placed on the leather and rubber sectors than on the plastic products industry. In addition, a look at the inspection and testing equipment in the plastic sector and rubber sector shows that the existing facilities and equipment are outdated, necessary facilities and equipment are not installed, and the testing infrastructure is not properly set up. Further, it is considered that the IRDLAI with its present location and staff cannot sufficiently meet the needs of the plastic products manufacturers and rubber-based products manufacturers in Jakarta, Surabaya, Medan, etc., which are far from the location of the Institute.

The Pertamina Institute is well endowed with facilities, equipment, and engineers, but according to industrial sources, its service fees are high and therefore it is difficult for small and medium sized businesses to make use of them.

A JICA backed "Polymeric Materials Characterization" project is now underway in Bandung with the participation of the Research Institute for Polymers and Textiles of the Agency of Industrial Science and Technology on the Japanese side and the Research and Development Center for Applied Physics and Research and Development Center for Applied Chemistry of LIPI, the Institute for Research and Development of Cellulose Industry and the Institute for Research and Development of Textile Industry of the Ministry of Industry, and the Bandung Institute of Technology on the academic side on the Indonesian side.

FIPLASIN has recommended the establishment of a plastic center for strengthening testing and inspection services and development of human resources - with



a focus on accessibility by small and medium sized enterprises. A plan is underway on its establishment utilizing the IRDCI grounds with the cooperation of UNIDO.

Therefore, the aim of this program is to obtain a grasp of the current situation of these individual programs and projects which are now being proceeded or planned without proper linkage and also to engage in promotion of testing and inspection, standardization, development of human resources, and technical guidance to individual companies in the fields of high polymer materials and products, thus acting as a comprehensive service organization to the needs of private enterprises.

## **2 Detailed Content of Program**

A system will be established to cover plastic products, rubber-based products and other "high polymer" materials and products. An idea will include:

- (1) An approach to reinforce and improve the existing Institutes and projects under the Ministry of Industry and LIPI.
- (2) An approach to add the High Polymer Center functions to the most suitable institute selected among the existing Institutes, and
- (3) An approach to newly establish the High Polymer Center aside from existing Institutes.

The contents to reinforce and improve existing institutes and projects among above mentioned approaches are shown in Table 5-10-1.

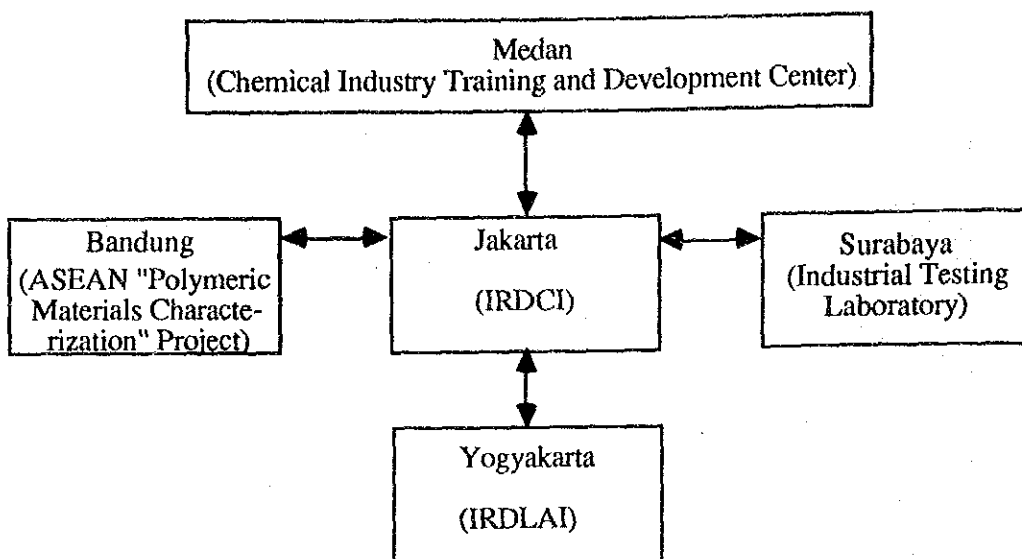
Approaches of (2) and (3) are to establish a High Polymer Center for covering and reinforcing insufficient functions of the existing Institutes with full consideration to utilizing the existing facilities and to the above-mentioned plan of FIPLASIN to establish plastic center. A study will be conducted to clarify the details in order to establish High Polymer Center which will be really useful to the needs of private enterprises. Consideration will be made of a two-stage program covering plastic products in the first stage and rubber-based products in the second.

The High Polymer Center would cover regions of concentration of plastics industries and rubber industries, so a study would be made of a system covering a wide area like Jakarta, Bandung, Medan, Yogyakarta and Surabaya as shown in Fig. 5-10-1.

**Table 5-10-1: Present High Polymer Related Institutes and Projects and Requirements for Reinforcement and Improvement in the Future**

Institute or Project	Present State	Characteristics	Requirements for Reinforcement and Improvement
(1) IRDCI	Institute for chemical industry as a whole	Testing and inspection of chemicals and chemical products, but proportion of plastics and rubber is small	Improvement of testing and inspection equipment. Fostering of human resources
(2) IRDLAI	Institute for the development of leather, rubber and plastics industries	Mainly, molding and finishing of leather, production technology of footwear	ditto
(3) Pertamina Institute	The facilities, research equipment and staff at the Institute are regarded excellent	Same level as institutes of developed countries in case of testing and inspection equipment and quality of human resources. But services to private companies are not main assignment.	Setting service fees at reasonable levels for small and medium-sized firms
(4) Plastic Packaging Center Project	To be set up in IRDCI	Implementation of testing and inspection facilities by UNIDO aid	In addition to testing and inspection of plastic packaging materials, others plastic products to be added
(5) ASEAN Polymeric Materials Characterization Project (Indonesia in charge of the ASEAN project)	<ul style="list-style-type: none"> <li>• High Polymer Academic Society founded in Bandung</li> <li>• New idea of LIPI, "High polymer Testing Center" or "Evaluation Center" is planned. The project will be finished in September 1992.</li> </ul>	Set up net-work system of government and academic groups through symposium and seminars	Although testing and inspection to private companies excluded, services to private sector to be strengthened

**Fig. 5-10-1: An Example of a System Covering a Wide Area of the High Polymer Center**



The following is recommended as the implementation process:

1) Establishment, at the initiative of the Ministry of Industry, of a venue for exchange of opinions among representatives of the government, private sector, and academia involved in high polymer materials and products ("liaison council") and periodic deliberations on needs of the private sector and cooperation from government and academia at the same time.

2) Invitation of a survey team comprised of overseas experts to conduct feasibility studies on how existing Institutes and projects are helping private enterprises, what kind of problems there are, and what sort of approach would be taken and size of facilities considered necessary in the High Polymer Center as a public organization

The overseas survey team would work for nine to 12 months and be organized as follows:

- Survey leader: 1
- Polymer testing and inspection (including standardization) experts: 2 (plastic products and rubber-based products)
- Experts in polymer materials and products or experts in production technology: 2 (plastic products and rubber-based products)

3) The Ministry of Industry, based on the above feasibility studies, would work to vitalize existing projects on its own initiative and would request assistance from overseas technical cooperation organizations for the acquisition of equipment, dispatch of experts, and overseas training of Indonesian staff.

The equipment considered necessary for the center will have to be determined in detail in the feasibility studies, but Table 5-10-2 provides an example of the equipment considered necessary for the testing and inspection of plastic products at the IRDLAI for reference purposes:

**Table 5-10-2: List of Testing and Inspection Equipment for Plastic Products to be Considered Necessary in the IRDLAI.**

Necessary equipment/fixtures	Quantity
Mixing Roll Mill	2
Autoclave	1
Rheometer	1
Oven	1
Moisture Previous Oven	1
Microscope	1
Analytical Balance	2
Micro balance	1
Electronic Precision Balance	1
Melting Pointer	1
Spectrophotometer	1
Automatic Absorption Spectrophotometer	1
Automatic Densitometer	1
Automatic Dropper	1
Test Specimen Adjuster	1
Mooney Type Viscometer	1
Constant Temperature Viscosity Bath	1
Viscosity Tester	1
Amsler Type Abrasion Tester	1
Taber Type Abrasion Tester	1
Brittle Point Temperature Tester	1
Low Temperature Bending Tester	1
Falling Tensile Impact Tester	1
Falling Ball Impact Tester	1
Repeated Falling Impact Tester	1
Izod Type Impact Tester	1
Film Impact Tester	1
Gas transmission Rate Tester	1
Repeated Flexural Fatigue Tester	1
Mullen Type Bursting Tester	1
Resilience Tester	1
RAT Type Universal Tester	1
Standard Gear Type Aging Tester	1
Standard Ozon Aging Tester	1
Heat Gradient Tester	1
Permanent Strain Tester	1
Heat Shrinkage Tester	1
Oxygen Absorption Tester	1
De Mattis Type Flex Cracking Tester	1
Twin Screw Compounder	1
Dies	1
Extruder	1
Injection Moulding	1
Extrusion Moulding	1
Blow Moulding	1
Compression Moulding	1
Transfer Moulding	1
Plasti-Corder	1
Planetarimixer	1
Tape Adhesion Roll	1
Mixer	1

### **3 Measures Urgently Requiring Implementation**

[1] By initiative of Ministry of Industry, establishment of a liaison council participated in by representatives of the government and private sector involved in high polymer materials and products so as to secure consensus before starting feasibility studies

[2] Invitation of overseas survey team to run F/S survey to obtain grasp of current state of the facilities, human resources, and activities of the high polymer related Institutes and projects and their relation to private sector needs

[3] For promotion of high polymer related industries, obtaining advice on the following by inviting overseas experts and, also, overseas training of Indonesian staff:

- 1) Establishment and promotion of national standards (SNI)
- 2) Building of a system for development and supply of human resources
- 3) Collection of domestic and foreign technical information

## **5-11 Program for Prevention of Industrial Pollution and Promotion of Energy Saving**

### **1 Background and Objectives of Recommendation**

#### **1) Prevention of Industrial Pollution**

Indonesia is beginning to put together an environmental protection program with the realization of the inseparability of economic development and environmental protection. Also, energy demand is increasing along with industrial development and therefore energy saving facilities and technology will have to be promoted in the future so as to conserve limited energy resources while promoting industry and raising corporate productivity.

In the Indonesian Constitution of 1945, environmental protection is clearly set forth as an important task of the country. Based on this, a law concerning water pollution was enacted in the 1970's, though it proved ineffective. In 1982, the "Fundamental Provisions for the Management of Life's Environment" were enacted and the Ministry of Population and the Environment took control over environmental matters. In 1990, the Agency for Environmental Management was established. In the Law No. 5 of 1984 on Industry, mention was made of the improvement of the people's welfare through a balance between the environment and development as one of the objectives of industrial development. And prevention of destruction and contamination of the environment by industrial activity became obligatory. Based on this, AMDAL (Environment Impact Assessment) became obligatory in industrial activities, and the Central Commission for AMDAL was established in the Ministry of Industry.

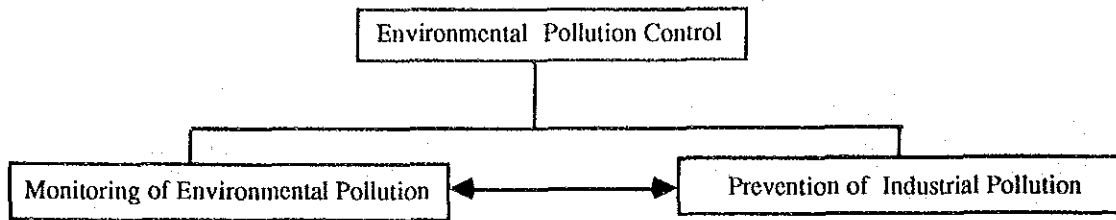
Even in Repelita V started in fiscal 1989/1990, economic development and environmental protection were deemed inseparable. The establishment of the AMDAL system, environmental monitoring, and other types of environmental protection programs were planned and implemented. Prevention of industrial pollution at the corporate level, however, a necessary adjunct of environmental monitoring, is extremely insufficient at the present time due to the lack of pollution prevention engineers, the negative stance taken by business managers, and the underdeveloped state of the industrial pollution prevention equipment industry.

In Indonesia, the problem of industrial pollution has worsened along with industrialization. The situation is now one in which immediate action should be taken in measures against environmental pollution, in particular, water pollution where having a direct and serious impact on the living environment of the consumer. In this case, special consideration must be given, through government assistance, to pollution prevention measures of small and medium sized enterprises which are poor in funding and technical expertise and find it difficult to devise pollution prevention measures on their own. The delay in starting measures to prevent industrial pollution has been confirmed in the six industrial sub-sector studies. Therefore, this is taken up as an issue in each of the sub-sector reports and also in Chapter 3 of this report.

For Indonesia to achieve both economic development and environmental protection, it is requested in the future to proceed and

- (1) Establish an implementing system for environmental monitoring and
- (2) Promote pollution prevention facilities and technology for preventing the environmental contamination accompanying industrial activities, train expert engineers to provide support, and develop a pollution prevention equipment manufacturing industry.

**Fig. 5-11-1: Basic Concept of Environmental Pollution Control**



- Fundamental Policies for Environmental Pollution Control
- Establishment of Environmental Quality Standards
- Environmental Pollution Control (water pollution, air pollution, soil pollution, noise, vibration, ground subsidence, offensive odors, etc)
- Disposal and Recycling of Wastes
- Bearing of Costs and Financial Measures
- Organization of Environmental Pollution Control

## 2) Promotion of Energy Saving

It is necessary to both tackle the issue of environmental protection and to promote energy saving. In both the advanced industrialized nations and the developing countries, there is a strong correlation observed between economic growth and energy demand. In Indonesia too, energy demand has grown along with economic development. However, most energy resources are limited and therefore establishment of a policy for efficient use of energy is sought in economic development. This contributes to improvement of business productivity as well.

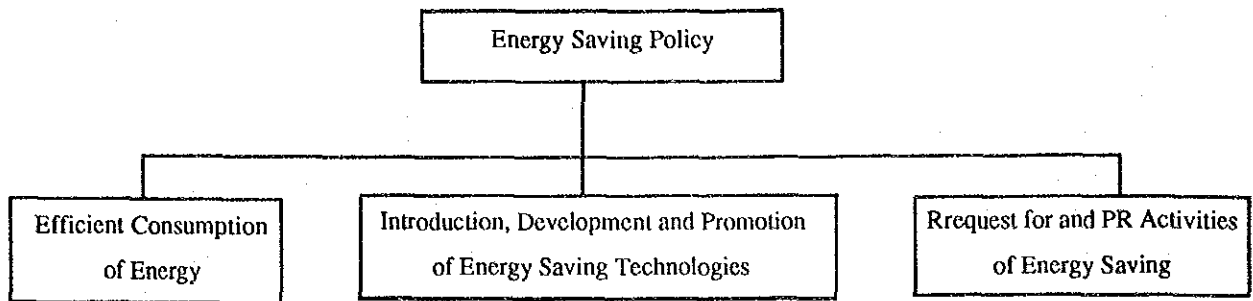
In the industrial sub-sectors covered by the survey, the percent of energy costs in the composition of total costs is relatively high, but the awareness of the need for efficient use of energy among business managers is disproportionately low overall. Therefore, to promote savings in the limited energy resources while promoting industry and raising business productivity in Indonesia, it will be necessary to call upon both industrialists and the people to save energy and to promote the spread of energy saving facilities and technology.

Energy saving responds to the economic and social demands of economic development, improvement of the level of welfare and protection of the environment, and eliminates waste in each stage of energy consumption so as to enable the maximum efficiency of energy consumption. Specifically, it improves energy consumption per unit to enable the maximum efficiency to be obtained with the minimum energy. For example, it means the improvement of production facilities and production processes so as to improve the efficiency of energy consumption in the industrial sector, the setting of suitable heating and cooling temperatures in buildings etc., the use of adiabatic constructions in housing, buildings, etc. in the consumer sector, and the improvement of the efficiency of energy consumption in automobiles etc. Further, promotion of recycling of waste would contribute to protection of the environment and also tie in to savings in resources, including energy.

To promote such energy saving measures, it is desirable to introduce, develop, and promote energy saving technology and it is necessary to campaign and run PR activities for energy saving. Therefore, based on the policies of Japan etc., the following is envisioned as the basic framework for the promotion of an energy saving policy. With reference to this framework, it is recommendable to formulate national plans for energy saving and establish systems for the promotion of energy saving.



**Fig.: 5-11-2: Basic Concept of Energy Saving Policy**



## **2 Detailed Content of Program**

1) The following is envisioned as the basic content of the program for prevention of industrial pollution. It would be desirable to establish a government organization for the comprehensive and efficient implementation of the same.

### **[1] Promotion of engineers**

Promotion of engineers able to deal with the basic design, introduction, and operation of pollution prevention facilities in treatment of waste water, exhaust, and waste products

### **[2] Education and training of engineers**

Education and training of engineers responsible for pollution prevention in industrial estates and businesses around the country

### **[3] Promotion of use of facilities and technology**

Promotion of use of pollution prevention technology through seminars, provision of information, etc. and assistance in the spread of facilities for preventing industrial pollution through preferential treatment in the financial area (subsidies, financing, taxation)

### **[4] Promotion of industrial pollution prevention facility industry**

Indonesia still does not have an industrial pollution prevention facility industry. It is desirable that such an industry be developed so as to enable the supply and sufficient maintenance of low cost, suitable performance industrial pollution prevention equipment and apparatuses. Therefore, a plan for development of such a pollution prevention facility manufacturing industry for Indonesia will be formulated.

### **[5] Drafting and promotion of policies**

In addition to the above, related policies will be drafted and promoted, including policies on research and development of industrial pollution prevention technology.

2) The following projects are recommendable for the promotion of energy saving.

[1] National plans for energy saving will be formulated and energy saving promotion systems be established.

[2] To save energy, energy saving campaigns and PR will be run broadly directed at the industrial world and the people. In particular, the industrial world will be called upon to [3] promote the efficient use of energy and [4] introduce, develop, and use energy saving facilities and technology. Preferential treatment in the area of financing will also be considered for [3] and [4].

## **3 Measures Urgently Requiring Implementation**

### **[1] A study on priority measures for the prevention of industrial pollution**

The current state of environmental contamination and industrial pollution will be determined, then a study will be made so as to which projects to give priority to while maintaining a balance with industrial development.

[2] A study on energy saving plans and systems

A study will be conducted for the formulation of energy saving plans and systems.

[3] Campaign for environmental protection and energy saving

A campaign will be started stressing the need for environmental protection and energy saving to industrialists and the people.

## **6. Initiatives and Major Policy Issues on the Indonesian Side**

### **6-1 Initiatives on the Indonesian Side**

In order to develop internationally competitive industries amid an environment of severe competition, it is hoped that the Indonesian Government, educational organizations and the private sector will unify opinions and proceed with efforts for development on their own initiatives. There are some existing facilities and organizations under the Government which might not be thought of as playing an effective role in the development of the private sector. Before giving thought to new programs, therefore, emphasis will be placed foremostly on the effective utilization of existing facilities and organizations.

### **6-2. Government and Private Sector Cooperation**

It is the private sector that will play the major role in promoting industry. To strengthen international competitiveness, each private company and group of companies are expected to positively move forward with replacement of old machinery, training of personnel, improvement of production technology and quality control, and augmentation of export marketing. On the other hand, it is hoped that the Government will take requests in from the private industry and give assistance to private companies in such areas as establishment and improvement of the infrastructure, coordination of various policies, establishment of a policy coordinating function, and measures to prevent pollution. The Government will also be requested to check fully whether the public R&D institutes and organizations are really helpful in strengthening private industries or not, and to execute necessary improvement measures. Thus, development of industries will be implemented by cooperation between public and private sectors and efforts by the both sectors will be necessary.

### **6-3 Major Policy Issues**

#### **1) Establishment and Improvement of Infrastructure**

Indonesia has been slow in establishing the necessary infrastructure, compared with the rapidity of growth of its industry. In particular, the shortage of electric power, communication, and road systems has obstructed industrial development and there is a great possibility of the gap between supply and demand becoming wider along with the rapid growth of the economy. It is hoped that the Government will take steps in this regard.

#### **2) Promotion of Flexible Trade Policies Etc.**

In executing industrial policies, it is necessary that tariff policies and other commercial and trade policies be maintained flexibly. Simplification of trade procedures and reduction of import tariffs, etc. have been accomplished so far, but their further implementation will be needed. For example, the high tariffs imposed on aluminium sheets result in high prices of aluminium products. As seen in this example, when domestic production of raw materials, parts, and intermediate goods cannot keep up with the rapid growth in demand, it is necessary to reduce the tariffs on imported intermediate goods etc. This is important in maintaining and strengthening the price competitiveness of products. Replacement of antiquated machinery and equipment is also important for strengthening competitiveness. It will be necessary to further strengthen incentives for importing the latest machinery.

### 3) Establishment of Policy Coordinating Function

It is desirable that the Government will adopt uniform policies in all fields of business management, from the procurement of capital goods to export marketing. Therefore, it is hoped that the Ministry of Industry will hold close deliberations with the related Ministries and Agencies, not only at the secretariat level, but also through the EKUIN and other venues in implementing policies, such as with the Ministry of Agriculture and the Ministry of Mining and Energy on raw materials and energy issues, the Badan Koordinasi Penanaman Modal on investment matters, and the Ministry of Trade and the National Agency for Export Development on trade issues and export marketing.

### 4) Necessity for Consideration of Pollution Prevention and Energy Saving

In proceeding with industrial policies, one must not forget to give proper consideration to pollution prevention and energy saving. When one takes measures to develop industrial sub-sectors of Indonesia, one will be requested to make efforts to harmonize industrial development with protection of environment and conservation of energy. Therefore, the Ministry of Industry is requested to take the initiative to implement the 5-11 Program for Prevention of Industrial Pollution and Promotion of Energy Saving in cooperation with other related Ministries.





