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JAPAN INTERNATIONAL COOPERATION AGENCY
THE MINISTRY OF INDUSTRY AND TRADE
THE REPUBLIC OF INDONESIA

**THE STUDY
ON
THE DEVELOPMENT OF SUPPORTING INDUSTRIES
IN
THE REPUBLIC OF INDONESIA**

SUMMARY REPORT

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February 1997

THE JAPAN RESEARCH INSTITUTE, LIMITED

YACHIYO ENGINEERING CO., LTD

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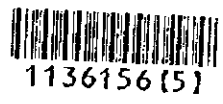
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PREFACE

In response to a request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct the Study on Industrial Sector Development - Supporting Industries - in the Republic of Indonesia, and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent a study team, led by Mr. Takashi Nobehara of the Japan Research Institute, Limited and constituted by members of the Japan Research Institute, Limited and Yachiyo Engineering Co., Ltd., to the Republic of Indonesia five times from January 1996 to December 1996.

The team held discussions with the officials concerned of the Government of the Republic of Indonesia, and conducted related field surveys. After returning to Japan, the team conducted further studies and compiled the final results in this report.

I hope this report will contribute to the development of supporting industries in the Republic of Indonesia and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation throughout the study.

February 1997



Kimio Fujita
President
Japan International Cooperation Agency

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INTRODUCTION

Since REPELITA IV, the Indonesian government has positioned the industrial sector as the driving force of economic development, aiming at the economic structural change which had previously been heavily dependent on the petroleum sector. At the beginning stage of industrial development, the major stress of industrial development strategy was placed on the invitation of major overseas assemblers to Indonesia, making use of the abundant labor force as an invitation tool. In recent years, however, higher strategic emphasis came to be placed on the establishment of stronger linkages of all of the industrial sectors.

In line with the above understanding, in August 1994, the Indonesian government requested that the Japanese government undertake a master plan study which aims at the development of the supporting industry in Indonesia focusing on the establishment of the essential industrial base for the Indonesian automotive, electrical and electronics, and machinery industries. In response to this request, the Japan International Cooperation Agency (JICA) sent a mission team to Indonesia in October 1995, and the team agreed with the Ministry of Industry and Trade of Indonesia on the "Scope of Work for a Study on the Development of Supporting Industries in Indonesia."

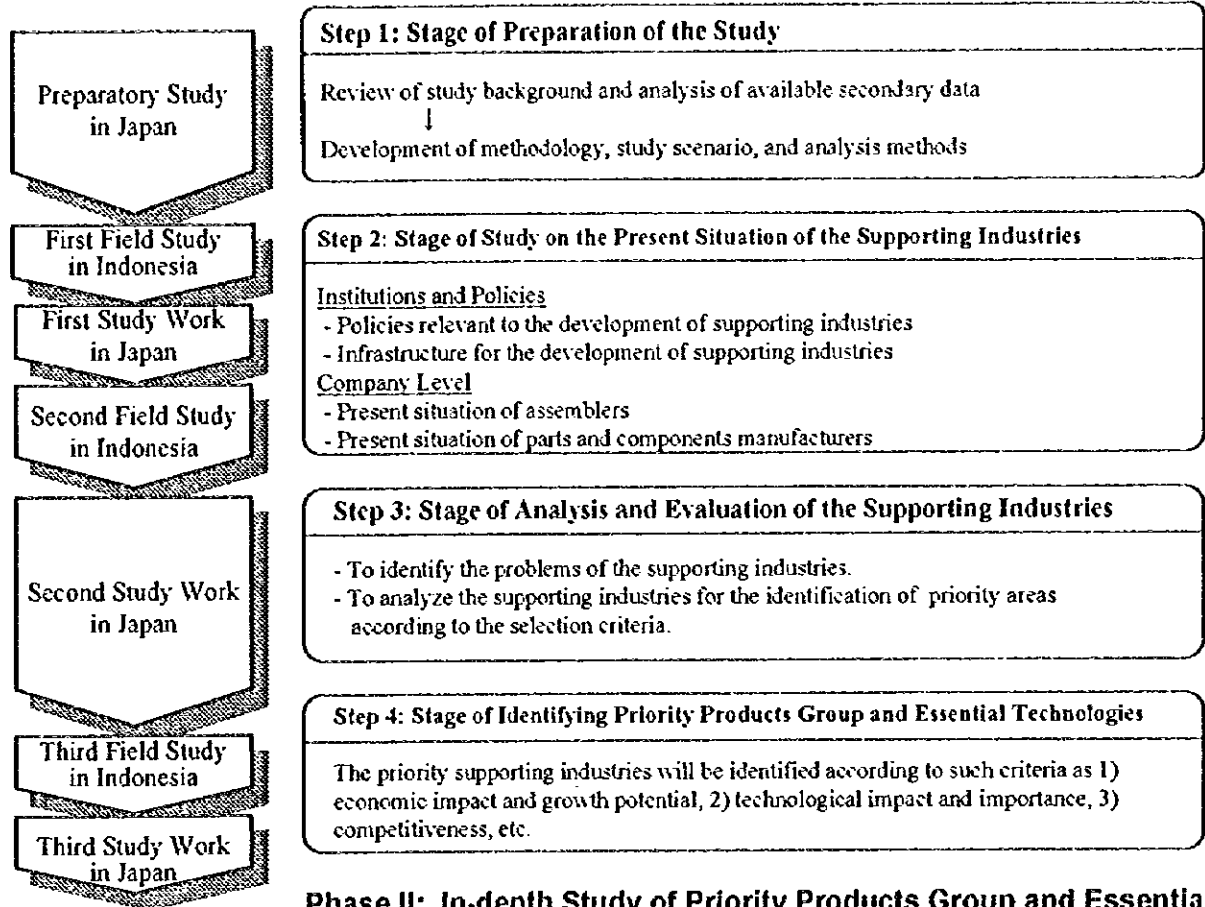
From the above background, the objective of the Study is to formulate a master plan for the development of the supporting industries in Indonesia, which would contribute to the strengthening of the industrial structure of Indonesia. The master plan is also expected to include practical suggestions for measures to solve the current technological problems as well as governmental action plans. In this report, supporting industry was defined as a group of industries which supply parts, components or engineering services for those assembly industries in the automotive, electrical and electronics or machinery fields. In addition, the target industries of the Study covered not only those industries which currently supply parts, components and services, directly or indirectly, to the assembly industries, but also the small scale local companies which have the potential to supply those industries, or the overseas

manufacturers which might invest in Indonesia and supply those goods and services in the near future.

For the implementation of the Study, the JICA Study Team, mainly consisting of researchers and consultants of the Japan Research Institute, Ltd. and Yachiyo Engineering Co., Ltd., was formed in January 1996, and the Study was started. The results of the Study were summarized in the Main Report. This report further briefly summarizes the contents of the Main Report.

Fig. 1 Overall Framework of the Study

Phase I: Selection of Priority Products Group and Essential Technologies



Phase II: In-depth Study of Priority Products Group and Essential Technologies and Formulation of a Master Plan

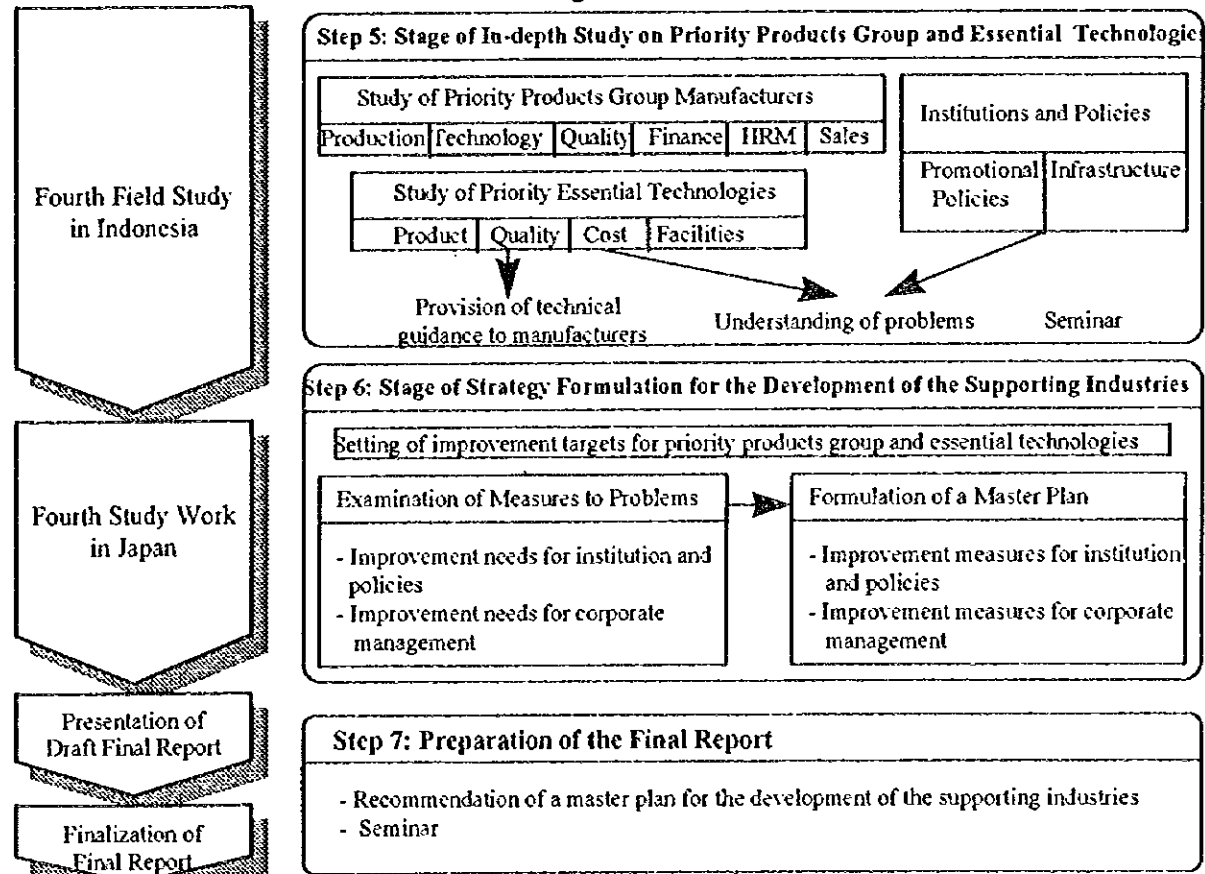
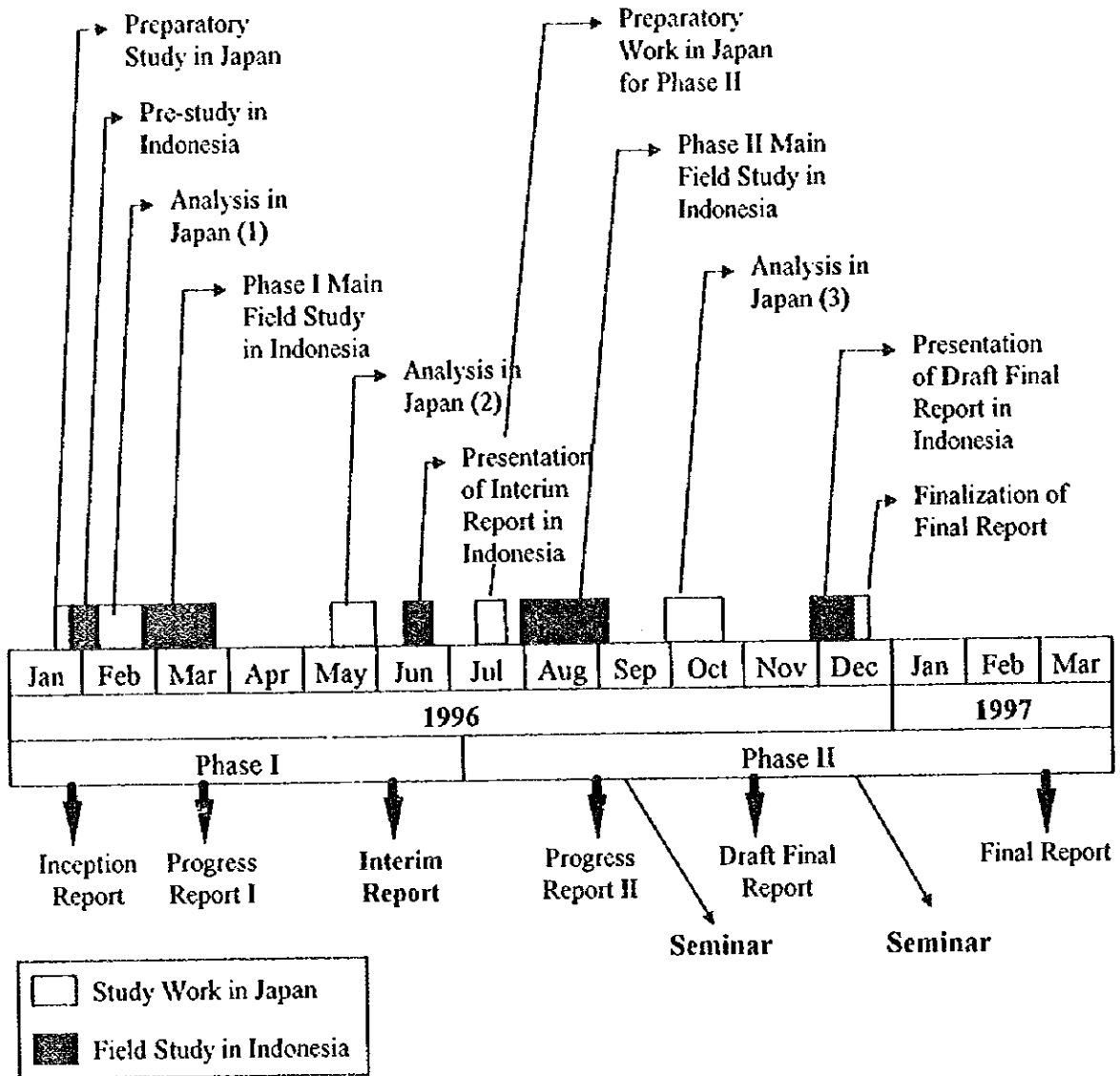


Fig. 2 Implementation Schedule of the Study



I. PROPOSAL OF DEVELOPMENT MASTER PLAN

1. PRESENT SITUATION AND PROBLEMS OF THE SUPPORTING INDUSTRIES IN INDONESIA

In summary, the following are the major problems of the present situation of the supporting industries in Indonesia.

- 1) **Industrial Structure** : The supporting industries have not yet adequately developed either in number and size. They do not compose a pyramid structure, ordinarily observed in the advanced countries, where wider secondary and tertiary layers are formed under the assemblers.
- 2) **Local parts and components manufacturers** have the following capability problems:

Management

- Most of the businesses are family-run and they have not acquired modern management skills.
- They lack marketing know-how and do not engage actively in marketing activities.
- They are not eager to start new business.

Technology

- They are lacking in modern production control technologies.
- It is not unusual that their equipment and facilities are obsolete.

Production Management

- Their internal training is not sufficient enough to develop good supervisors.
- Delay in delivery often occurs due to poor delivery control systems.
- Poor quality control systems bring about unstable quality and high defect ratios.
- The operating ratios are low due to a low level of order receipt and inadequate production management.
- Their cost competitiveness is weak for their quality level.

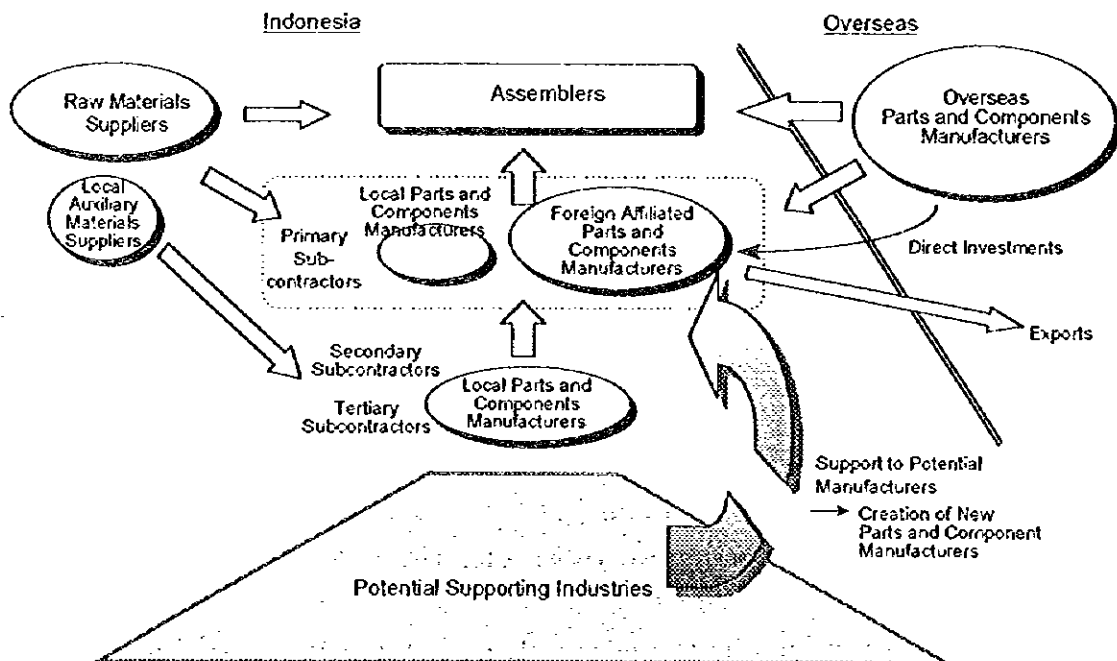
- 3) **Trend of local procurement by assemblers** : Assemblers still rely mainly on imports and in-house production for essential and/or critical parts and components. Even in their local procurements, purchases from foreign-affiliated companies oc-

occupy a larger portion in terms of value. Thus, the Indonesian parts and components manufacturers supply a limited range of products, such as products which do not require high technologies and auxiliary materials.

- 4) Investment trend of foreign parts and component manufacturers : The number of foreign parts and components manufacturers intending to invest in Indonesia is steadily increasing as a result of the Indonesian Government's open economic policy and the requests by assemblers operating in Indonesia. However, the investment promotion competition to attract these companies into Indonesia would become more severe since the neighboring countries such as Thailand or Malaysia are also carrying out such promotional activities..

- 5) Competitive Situation : The Asian regional market would be unified with the realization of AFTA in 2003. In the region, in responding to the rise in income levels, both the Indonesian domestic market and the neighboring export markets will continue to grow. Aiming at this rapidly growing markets, the competition among parts manufacturers located in Indonesia and in other neighboring ASEAN countries would become more severe.

Fig. 1-1 Structure of the Supporting Industries in Indonesia



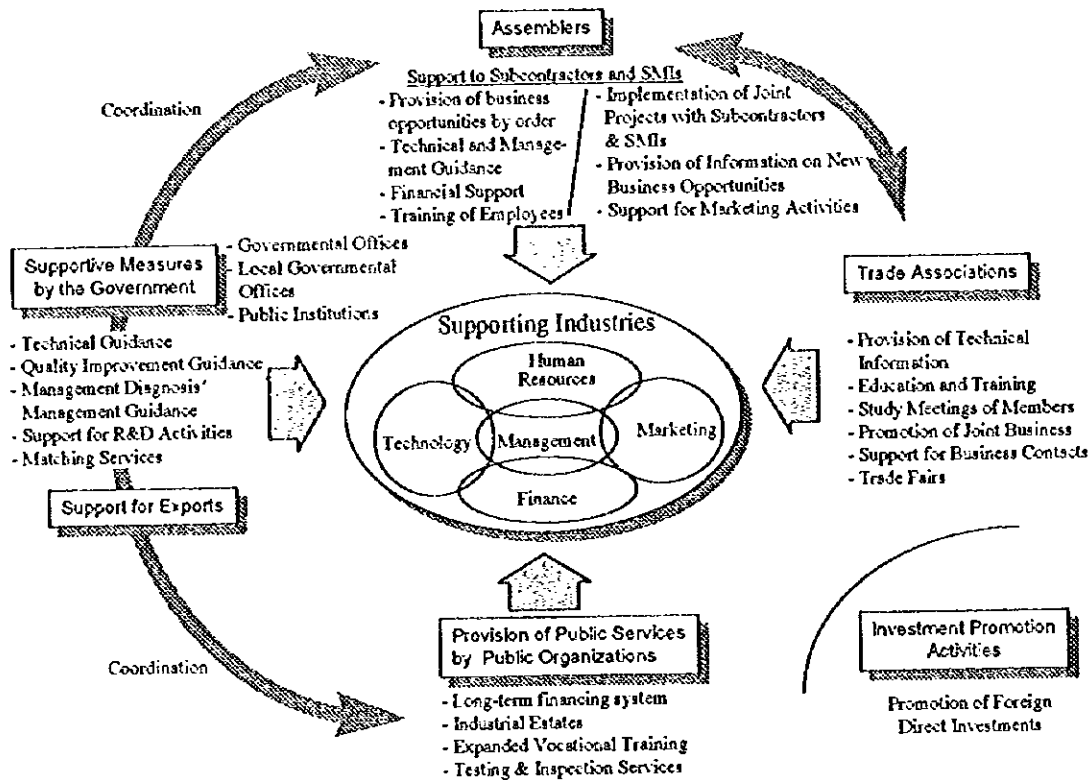
2. BASIC STRATEGIES FOR THE DEVELOPMENT OF THE SUPPORTING INDUSTRIES

(1) Basic Policy

The development of the supporting industries shall be promoted on the basis of the following principles:

- i. The development strategies should be established making such objective clear that the development target should be placed not on the protection of the weak small scale manufacturers but on the development of sufficiently competitive medium and small scale parts and components manufacturers. An integrated approach will be realized through the joint efforts by the public sector and private sector based on the well-organized coordination among related organizations, i.e., governmental offices, public institutions, assemblers, and trade associations.
- ii. The development will place importance on self-supporting development efforts by the supporting industries.
- iii. The development will make use of supportive activities by the private sector, especially those of assemblers.
- iv. The investments by foreign parts and components manufacturers will be actively promoted with the emphasis on its role as a driving force.
- v. The development will emphasize the market mechanism in order to build internationally competitive industries.
- vi. The government's participation will be basically directed to the creation of good business environments and the provision of services which can not borne by individual companies, in other words, industrial infrastructure, which match the needs of the supporting industries.

Fig. 1-2 Concept of Integrated Approach by the Public and Private Sectors



(2) Basic Strategies

The following six approaches shall be adopted as basic development strategies for the supporting industries in Indonesia:

Approach I: To establish a policy framework for the development of the supporting industries and an organization for effective implementation.

Action to be Taken: To establish a policy set-up for the development of the supporting industries. (Measure-1)

Approach II: To improve the levels of the supporting industries in terms of production technologies and managerial skills. As well as the government's support, supports from assemblers and trade organizations will play an important role. Human resource development will be also important for the upgrading of technological and managerial levels of the supporting industries.

Action to be Taken: To support the improvement of the technological level of the supporting industries (Measure-2)
To support the improvement of managerial skills of the supporting industries. (Measure-7)

Approach III: To expand subcontracting businesses of the supporting industries in order to develop the linkage between assemblers and subcontractors. Technological transfer from assemblers to subcontractors will be promoted and information for subcontracting business promotion, such as buyer information, supplier information, and market needs, will be provided.

Action to be Taken: To support marketing activities of the supporting industries. (Measure-10)

Approach IV: To promote foreign direct investments by the world leading parts and components manufacturers and capital and/or technological tie-ups among overseas and local manufacturers.

Action to be Taken: To support foreign direct investments and technological tie-ups. (Measure-12)

Approach V: To expand exports of parts and components by raising international competitiveness and by supporting overseas marketing activities.

Action to be Taken: To support overseas marketing activities of the supporting industries. (Measure-11)

Approach VI: To promote the development of industrial infrastructure by the government to provide a good business environment for the supporting industries. Industrial infrastructure will include such areas as financing system, R&D support, standards, and tax systems, in addition to such ordinary infrastructure as industrial estates.

Action to be Taken: To establish quality management systems of the supporting industries. (Measure-3)
To expand the support for R&D activities of the supporting industries. (Measure-4)

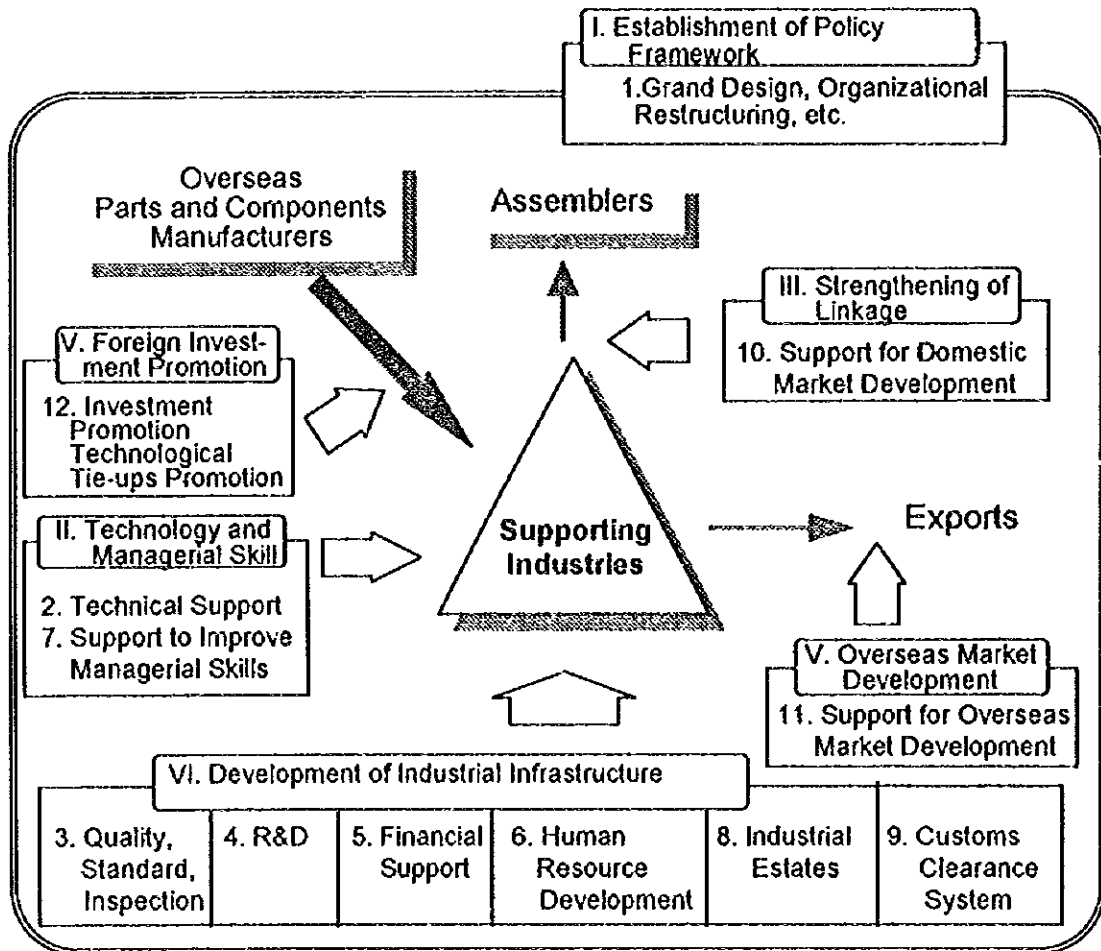
To expand loans toward the supporting industries.
(Measure-5)

To expand human resource development (education and training). (Measure-6)

To develop industrial estates for the supporting industries.
(Measure-8)

To improve customs clearance systems. (Measure-9)

Fig. 1-3 Basic Strategies for the Development of the Supporting Industries



(3) Development Targets of the Supporting Industries

Targets in terms of the number of parts and components manufacturers to be developed are as shown in Table 1-1. They will be increased from approximately 900 at present to 1,800 in the year 2002, and to 2,500 in the year 2007 according to the growth targets by industries.

Table 1-1 Targets of the Number of Parts and Components Manufacturers to Be Developed

| | (No. of Companies) | | |
|---|--------------------|-----------|-----------|
| | Year 1996 | Year 2002 | Year 2007 |
| Targeted Number of Parts and Components Manufacturers | 900 | 1,800 | 2,500 |
| Existing Parts and Components Manufacturers | 900 | 900 | 1,800 |
| Additional Parts and Components Manufacturers | | +900 | +700 |
| Of Which, New Foreign Investments | | +250 | +150 |
| Of Which, New Domestic Investments | | +300 | +250 |
| Of Which, to Be Developed from Existing SMIs | | +300 | +300 |

Table 1-2 Types of Parts and Components Manufacturers by Type of Company

| Type of Company | Type of Parts and Components Manufacturers | | | |
|--------------------------|--|-------------------------|---------------------------|--------------------------|
| | Independent Suppliers | Primary Sub-contractors | Secondary Sub-contractors | Tertiary Sub-contractors |
| Existing Manufacturers | XX | XX | X | |
| New Foreign Investments | XX | X | | |
| New Domestic Investments | X | XX | X | |
| Development from SMIs | | X | XX | XX |

Note: XX - Major type of manufacturer X - Relevant type of manufacturer

(4) Expected Results of the Development of the Supporting Industries

The following outcome can be expected as a result of the development of the supporting industries:

- i. Creation of employment opportunities as a result of the expansion of parts and components production
- ii. Reduction of parts and components imports at the progress of localization

- iii. Expansion of parts and components exports
- iv. Improvement in assemblers' competitiveness with the increased availability of high-quality and low-cost parts and components
- v. Improvement of technological fundamentals of essential technologies

Table 1-3 Development Target Indices by Industry

(Unit : Rp. Billion)

| Development Target Industry | | 1995 | 2002 | 2007 |
|--|------------------|---------|---------|---------|
| Automotive Parts | Production value | 2,557 | 9,162 | 18,428 |
| | Exports | 356 | 1,067 | 5,404 |
| | Imports | 6,387 | 6,623 | 5,582 |
| | No. of employees | 47,177 | 86,761 | 108,336 |
| Electrical & Electronics Parts | Production value | 3,244 | 15,173 | 35,999 |
| | Exports | 2,003 | 7,177 | 14,436 |
| | Imports | 3,755 | 15,743 | 32,345 |
| | No. of employees | 72,169 | 173,406 | 255,493 |
| Machinery Parts | Production value | 868 | 3,975 | 9,221 |
| | Exports | 242 | 472 | 759 |
| | Imports | 3,868 | 5,254 | 5,642 |
| | No. of employees | 38,578 | 90,753 | 130,794 |
| Total of the Development Target Industries | Production value | 6,669 | 28,310 | 63,648 |
| | Exports | 2,601 | 8,716 | 20,599 |
| | Imports | 14,010 | 27,620 | 43,569 |
| | No. of employees | 157,924 | 350,920 | 494,623 |
| Total Manufacturing | Total production | 186,367 | 363,177 | 584,899 |

Source : Table 5-1 ~ 5-3

3. OVERALL DEVELOPMENT STRATEGIES

The overall development strategies which consist of 12 measures and cover the following eight areas are proposed; 1) policy framework, 2) technical support and R&D development, 3) financial support, 4) human resources development, 5) management skill development, 6) industrial infrastructure, 7) marketing and 8) investment promotion.

Table 1-4 Overall Development Measures for the Supporting Industries

| Area | Measure | Content |
|--|--|---|
| Institutional Policy Framework | 1: Preparation of the Institutional Framework for the Development of the Supporting Industries | (1) Establishment of Overall Supportive Measures for the Supporting Industries and Review of the Existing Small Industries Development Policies |
| | | (2) Establishment of an Organization for the Development of the Supporting Industries |
| Technical Support/ R&D Capability Improvement | 2: Improvement of Technical Level of the Supporting Industries | (1) Promotion of technological transfer from assemblers to their subcontractors |
| | | (2) Expansion of technical guidance by public institutions |
| | | (3) Promotion of education and training on production management for engineers |
| | | (4) Expansion of activities of trade associations |
| | | (5) Mediation of technological tie-ups |
| 3. Improvement of Quality Control | | (1) Establishment of an institution which engages in the diffusion of quality control technologies |
| | | (2) Development of a quality control system suited to SMIs and preparation of an introduction manual for that system |
| | | (3) Organizing of personnel in charge of quality control |
| | | (4) Provision of information on quality control |
| 4. Improvement of R&D Activities/ New Product Development Capabilities | | (1) Promotion of the localization of the function of authorizing new parts and components at assemblers |
| | | (2) Expansion of facilities of R&D institutions under MOIT |
| | | (3) Promotion of joint R&D activities by the industry, public sector and academic sector |
| | | (4) Support for R&D by private companies |
| | | (5) Education and training for R&D personnel |
| Financial Support | 5: Expansion of Finance to Small and Medium Industries | (1) To widen the eligibility of KUK to medium scale industries |
| | | (2) To introduce a two-step loan for the supporting industries |
| | | (3) To establish a public financial institution specializing in finances for small and medium scale companies |
| Human Resource Development | 6. Expansion of Human Resource Development System | (1) Establishment of a national-level vocational training system which responds to the needs of industries |
| | | (2) Expansion of vocational training centers |
| | | (3) Expansion of employee training within the industries |
| | | (4) Training of engineers and technicians |

Table 1-4 Overall Development Measures for the Supporting Industries (Continued)

| Area | Measure | Content |
|---------------------------|---|---|
| Managerial Skills | 7. Improvement of Managerial Skills | <ul style="list-style-type: none"> (1) Expansion of education and training of managers (2) Management modernization through management diagnosis and consulting (3) Support for entrepreneurs |
| Industrial Infrastructure | 8. Development of Industrial Infrastructure for the Supporting Industries | <ul style="list-style-type: none"> (1) Promotion for the locating of supporting industries in specific industrial areas (2) Preparation of industrial estates for small and medium scale companies |
| | 9. Rationalization of Tax and Tariff Systems and Realization of Quick Customs Clearance | <ul style="list-style-type: none"> (1) Review of Domestic Tax Systems <ul style="list-style-type: none"> a. To reduce luxury taxes on electric home appliances, except for high-grade products b. To revise luxury taxes on automobile sales (2) Improvement in Import Duty System <ul style="list-style-type: none"> a. To unify import-related taxes b. To shift from consignment customs clearance to customs clearance by the government itself c. To simplify and speed up customs clearance procedures by introducing an electric data processing system d. To integrate the taxation section and the refund section and to simplify and quicken tariff refund procedures e. To secure an accord between industrial policy and the tariff system |
| Marketing | 10: Support for Domestic Marketing | <ul style="list-style-type: none"> (1) Support to parts and components manufacturers in finding orders from new customers (2) Preparation of a database on parts and components manufacturers (3) Expansion of activities of mediating between suppliers and buyers of parts and components |
| | 11. Support for Export Marketing | <ul style="list-style-type: none"> (1) Expansion of public organizations' support for overseas marketing activities (2) Provision of information services on overseas markets by public organizations (3) Support for export-oriented parts and components manufacturers |
| Investment Promotion | 12. Expansion of Investment Promotion Activities | <ul style="list-style-type: none"> (1) Establishment of clear foreign investment policies (2) Implementation of investment promotion activities toward clarified targets (3) Expansion of provision of information for investment promotion (4) Provision of assistance to investments by foreign small and medium parts and components manufacturers |

Institutional Policy Framework

Measure 1: Preparation of the Institutional Framework for the Development of the Supporting Industries

(1) Problems Regarding the Institutional Framework and Policy Mechanism

1) Problems of Existing SMI Development Measures

The following are pointed out as problems concerning the existing SMI development measures:

- i. Policies and measures for the development of medium scale industries are lacking in the government's SMI policies.
- ii. More integrated approach is required for the development of the supporting industries.
- iii. Within the Ministry of Industry and Trade, the functions of SMI development are assigned to several departments.
- iv. Coordination and cooperation with other related ministries is essentially needed for more effective development of the SMIs.

2) Direction of the Improvement

To solve the above-mentioned problems, it is necessary to establish an effective and consistent policy for the supporting industries, by reviewing existing policies and restructuring an organization for the promotion of SMIs. In more detail, the following actions are recommended:

- i. To review target enterprises under the SMI policies
- ii. To establish an executing organization which can realize the effective implementation of the supporting industry development policies.
- iii. To review and streamline supportive measures so that they can be applied most effectively according to the types of supporting industries and their specific development targets.

(2) Recommendations

- 1) Establishment of Overall Supportive Measures for the Supporting Industries and Re-

view of the Existing Small Industry Development Policies

An organization which can secure an integrated approach to the development of supporting industries should be established. At the same time, the existing SSI development policies will be reviewed. The measures to be taken are as follows:

i. Upward shift of target companies of SMI policies

To introduce a category of medium scale industries defined as below. The scope of small scale industry development measures will be extended to the medium scale industries, and the development of both small and medium industries will be concurrently promoted.

New Definition of Enterprises in the Industrial Sector

Small Scale Industries: Total assets (excluding land and buildings) of Rp. 600 million or less

Medium Scale Industries: Total assets (excluding land and building) of Rp. 2.0 billion or less

Large Scale Industries: Total assets (excluding land and buildings) over Rp. 2.0 billion.

ii. Definite distinction between the development of the supporting industries and the protection and promotion of small industries : Sets of measures will be appropriately provided according to the size and growth stage of companies.

iii. Realization of efficiency in supportive measures from the aspect of expense - effect : The measures which are proved to be effective are to be adopted. This effort will place importance on the establishment of mechanisms which can make use of the dynamism of the private sector.

iv. Establishment of harmony with international business rules and with society : The requirements set by the international business world, such as the protection of property rights, the introduction of environmental standards, and the restriction on unfair trade treatments by WTO, are connected directly and indirectly with Indonesian supporting industries. These problems should be fully considered in formulating the policies for the supporting industries development. In addition, careful consideration should be given to possible environmental problems. This is because the small and medium scale industries tend to create environmental

problems, for example, in the pollution of nearby areas, bad working conditions, improper treatment of wastes due to obsolete equipment and bad operating conditions. There is a possibility that these problems will be more serious when these companies advance to the process of further growth.

2) Establishment of an Organization for the Development of the Supporting Industries

By establishing an organization specialized for the development of the supporting industries, such activities as the unification of the process from planning to implementation; establishment of an efficient implementation system; and necessary renovation and expansion of facilities and equipment are to be actualized.

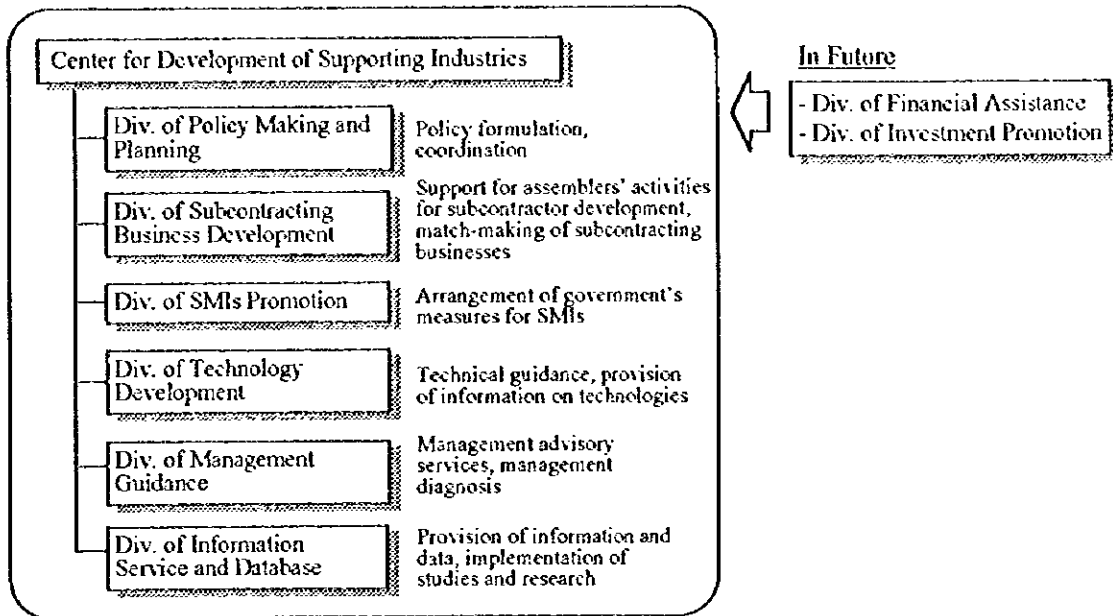
In practice, an organization which administers the whole process of development policies for the supporting industries will be set up by unifying functions related to the supporting industry development within various departments of MOIT, such as BAPIK and directorates general by sector, and by creating a specific department. At the final stage, this department will fulfill the following functions:

- To make development policies for the supporting industries
- To implement development policies for the supporting industries
- To coordinate the activities of various organizations related to the supporting industries development
- To monitor and evaluate the progress of the measures and programs for the supporting industries development
- To carry out research and establish databases on the supporting industries

This department will be a "one-stop service center," general contact desk for government's services for the supporting industries. This will accept applications and provide the following services:

- Construction of databases and provision of information
Provision of information on government's supportive programs; technical guidance programs; training programs; assemblers' purchase needs; and export opportunities
- Matching services of subcontracting businesses
- Arrangements and implementation of management advisory services and technical guidance services
- Desk for receiving applications for various governmental approvals

Fig. 1-4 Organization and Functions of Assumed Department for the Supporting Industries



Technical Support/ R&D Capability Improvement

Measures 2: Improvement of Technological Level of the Supporting Industries

(1) Problems Regarding Technological Development

Technologies required for manufacture by the supporting industries are mostly those which have been established and widely used among manufacturers in advanced countries. Therefore, a key problem is how to gain access to and from whom to receive these technologies. Major sources of technologies which Indonesian parts and components manufacturers currently utilize and their problems are summarized as follows:

Table 1-5 Present Situation and Problems of Technology Development by Types of Source of Technology

| Source of Technology | Present Situation | Direction of Improvement |
|--|--|---|
| Technological transfer from parent company | Foreign parts and components manufacturers investing in Indonesia usually bring in technologies of their parent companies. | To promote investments of foreign parts and components manufacturers to accelerate the transfer of the latest technologies. |

| | | |
|--|--|---|
| Technical guidance by assemblers | Automotive assemblers provide technical guidance to their primary subcontractors. But they usually do not support secondary and tertiary subcontractors. | To promote the expansion of supportive activities by assemblers. To encourage the support for secondary subcontractors by primary subcontractors. |
| Technical tie-up | Only large scale primary subcontractors can make a technical tie-up with a foreign manufacturer. Assemblers often act as a go-between for technical tie-ups. For parts and components, potential licensors are, in many cases, SMIs and they are sometimes reluctant in licensing. | To expand promotional activities for technical tie-ups. To provide tax incentives for technical tie-ups. |
| Introduction of technology from material and machinery manufacturers | When local companies purchase machinery and equipment, few of them receive technological guidance on production management from suppliers. Therefore, their capability for plant maintenance or quality control are not improved. | To promote the modernization of plants with the provision of preferential credits for plant modernization. To raise manufacturers' recognition of the importance of receiving technical guidance in line with the purchase of machinery. To advise them to include a maintenance system in a purchase contract at the introduction of new machinery. |
| Technical guidance by public institutions | Technical advisory services by R&D institutions obtain good results. However, there still exist such problems as the modernization of technologies of R&D support organizations and the necessity of expanding coverage of local areas. | To raise the level of technical guidance by R&D institutions. To expand technical guidance at local areas. To improve the level of visiting advisors. To introduce a registration system of specialists and make use of them as technical advisors. |
| Technical guidance by specialists | This is effective for the improvement of technological levels of manufacturers. Problems are who is to bear expenses and how to find specialists matching the needs of manufacturers. Long-term use of advisory service is necessary for the improvement of production management. | To prepare databases of specialists and introduce appropriate specialists to manufacturers. To promote the use of specialists by SMIs by providing incentives and financial supports.. |
| Introduction of technologies by trade associations | This can be a source of information which SMIs can easily access. At present, the introduction of technologies and technology exchanges by members are not active at trade associations. | To expand activities of trade associations and technology exchanges among members. To introduce overseas technology with the collaboration with overseas trade associations. |
| Study through seminars, books, etc. | The availability of information on latest technologies overseas is limited. | To increase seminars by R&D institutions and trade organizations to introduce latest technologies. |

(2) Recommendations

The following measures are recommended for the improvement in technological level of local

parts and components manufacturers:

i. Promotion of technological transfer from assemblers to their subcontractors

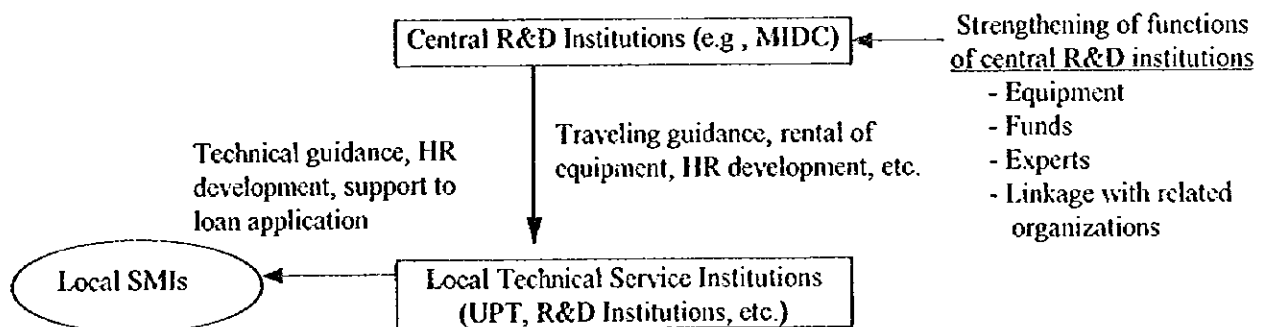
Assemblers are promoting the development of local subcontractors. Some of them have formulated an integrated program for subcontractor development, including technical guidance. Examples are subcontractor development programs implemented by Toyota Astra and National Gobel. It is very important to further encourage these activities.

ii. Expansion of technical guidance by public institutions

It is recommended to expand traveling technical guidance by public institutions. The contents of technical guidance will be upgraded through education and training of instructors and provision of additional necessary equipment. In addition, a technical advisor system will be introduced to register specialists and experts as technical advisors and to make the most use of them.

At local areas, the services of local R&D institutions and UPTs should be upgraded. It is necessary to reinforce central R&D institutions so that they can support the expansion of local R&D institutions' capabilities.

As for the expansion of local institutions, the important areas should be identified and given development priority. Possible candidate priority areas are JABOTABEK and Surabaya where many assemblers are located, and areas which are metal processing centers including casting and forging.



iii. Promotion of education and training on production management for engineers

Factories of Indonesian supporting industries lack personnel who have sufficient knowledge on production management necessary for process control, product evaluation, and systematic improvement activities. It is necessary to expand education and training on production management at universities and public training institutions.

iv. Expansion of activities of trade associations

It is recommended that the activities of trade associations, especially activities for upgrading technological levels of member companies, be expanded. In more detail, the following should be carried out:

- Provision of information on latest technologies
- Formation of study groups of members for study on technology improvement
- Organizing of factory visits to excellent factories

Measures 3: Improvement of Quality Control

(1) Problems Regarding Quality Control

The acquisition of ISO 9000 is a common task of parts and components manufacturers in Indonesia. This is essential for export-oriented parts and components manufacturers. However, it is very difficult for SMIs to establish a quality control system on the basis of ISO 9000. Therefore, it is necessary to develop a quality control system which is suitable for SMIs and get it to them.

In Indonesia, many primary subcontractors have introduced a quality control system. However, they have problems concerning the selection and maintenance of inspection equipment and this leads to the production of defective products. At secondary subcontractors, in general, even inspection systems are not sufficiently established and quality control systems have not been introduced.

Major problems in parts and components manufacturers establishing a quality control system are:

- i. Both top management and workers have insufficient recognition of the importance of quality.
- ii. Knowledge of quality control methods is insufficient.

iii. There are insufficient personnel who can take care of quality control.

(2) Recommendations

i. Establishment of an institution which engages in the diffusion of quality control technologies

In Indonesia there exist several organizations providing advisory services and training for quality control, for example, PT Sucofindo, B4T, and ITQC. However, there is no institution responsible for the diffusion of quality control to the whole country. It is recommended to set up an institution which carries out research on quality control and spreads systematically and continuously the outcome to companies in the country.

ii. Development of a quality control system suited to SMIs and preparation of an introduction manual for that system

A quality control system which is appropriate for SMIs shall be developed and diffused to SMIs.

iii. Organizing of personnel in charge of quality control

Quality control personnel and advisors of private companies, the governmental offices, public institutions, and the academic world shall be registered as QC specialists. The latest information on quality control will be distributed to the persons registered.

iv. Provision of information on quality control

It is necessary to collect books and materials concerning quality control both overseas and domestic and make them open to the public, especially to persons engaging in quality control.

R&D Activities

Measure 4: Improvement of R&D Activities

(1) Problems Regarding R&D Activities

Almost none of the parts and components manufacturers, except foreign-affiliated companies, engage in in-house R&D activities.

Local subcontractors are at the level that they can manufacture products as instructed by drawings provided by assemblers. Local manufacturers producing general parts or REM parts remain at the technological level of manufacturing products similar to other products on the market and it is hard for them to improve their products based on their original technologies. This situation is due to their insufficient R&D capabilities in terms of business size, facilities, technological level, and personnel.

Both the provision of direct support and incentives to promote R&D activities by the private sector and the upgrading of public institutions' support capabilities are necessary for the betterment of R&D capabilities of the supporting industries.

(2) Recommendations

- i. Assistance for the localization of the function of authorizing of new parts and components at assemblers

In the automotive industries, prototypes newly developed by parts and components manufacturers have to follow a complicated and time-consuming process of authorization until they are accepted by assemblers. This has been one of the major factors which hinder the development of parts and components manufacturers' R&D capabilities and original technologies. To promote the localization of assemblers' authorization function and encourage the use of local parts and components is important to activate R&D activities of parts and components manufacturers.

By expanding both tax and other incentives for the investment on R&D investments of assemblers, the government should encourage assemblers in the automotive, electrical and electronics industries to shift their development processes to Indonesia.

- ii. Expansion of facilities of R&D institutions under MOIT

With the localization of parts and components, the products developed locally should be evaluated to see whether they are manufactured according to the designs. However, it is a big financial burden for parts and components manufacturers to be equipped with testing facilities. They ask public and private testing institutions or overseas institutions to provide such facilities.

Based on the survey of the private sector's need for testing services and support for R&D, it is necessary to expand the capabilities of public R&D institutions by supplementing necessary equipment and training necessary personnel, as well as to establish a quick service system.

iii. Promotion of joint R&D activities by the industry, public sector and academic sector

Such products as automobiles, electrical and electronic equipment, and machinery are composed of a large number of parts and components which are synthetic and organically combined. Therefore, they call for both synthetic and diversified technologies as well as technologies specific to individual parts and components. In these industries, diversified joint R&D is undertaken in addition to R&D by individual parts and components manufacturers.

As for the use of new materials, joint R&D by material manufacturers, an assembler, and parts and components manufacturers is carried out in advanced countries. Joint R&D by types of processing, e.g., casting, forging, and machining, and joint R&D for assembled units is also carried out.

The following are possible forms of joint R&D:

- An assembler takes the initiative to form a joint R&D group consisting of several parts and components manufacturers and gives support to this group in technical advice and product testing.
- Member companies carry out joint R&D initiated by a trade association. The trade association arranges necessary technological and financial supports from the public sector and assemblers.

iv. Support for R&D by private companies

Such governmental incentives as tax incentives and subsidies are necessary to promote private sector's R&D although their eagerness for product development is the key for success.

Tax incentives for R&D have already been introduced. However, it is pointed out that this does not function well due to operational problems. It is recommended that this system be reviewed to make it work effectively.

In addition to tax incentives, the introduction of an R&D subsidy which covers one third to a half of total expenses and subsidy for researches on overseas technologies should be examined. These measures are effective to support technology-oriented SMIs and ventures started by engineers who have excellent but need such support.

It is also recommended that a system be introduced where support of technical advisors for R&D is available at inexpensive cost.

v. Education and training for R&D personnel

The developing of excellent engineers is also an important task for the promotion of local R&D, as well as other technological issues. Especially for R&D, the following measures should be taken in the area of education and training:

- To expand the engineering curriculum at universities.
- To expand scholarships to promote overseas training at private companies.
- To activate information exchanges among engineers in private companies, public institutions, and universities.
- To accumulate experienced personnel through joint R&D activities.

Financial Support

Measure 5: Expansion of Finance to Small and Medium Industries

(1) Problems Regarding Finance for the Supporting Industries

1) Problems Regarding Financial System

At present in Indonesian, KUK (Kredit Usaha Kecil) exists as a credit program to small scale enterprises. The credits under this program have shown a rapid growth and the government's effort to facilitate funds for small scale industries seems successful. The policy objective of maintaining a tight monetary policy is also achieved because the funds for KUK are not fresh money.

However, the existing KUK is not sufficiently effective to satisfy financial needs of the supporting industries due to the following reasons:

i. Eligibility

Companies eligible for this program are those who have total assets of not more than Rp. 600 million. Many of the companies in the supporting industries which require a large amount of capital can not be benefited by this program.

ii. Credit ceiling

The maximum credit line of KUK is Rp. 250 million. This amount is not enough to cover purchase of high productivity and high accuracy facilities and equipment required by the supporting industries.

iii. Character of short-term finance

Sources of the funds are banks' own funds. Therefore, credits under the program are mostly short-term. This is not suitable for credits to the industrial sector's capital investments which should be financed by long-term credits.

As major problems in implementing financial programs for small and medium scale industries, the following are pointed out:

Problems on the borrower side

- i. They can not prepare a feasible project because they are not accustomed to application procedures and they lack the project formation capability.
- ii. There often is an eligibility problem concerning their management capabilities in administration, marketing and production management.

Problems on the lender side

- i. Credit cost is high because amounts of credits to small scale industries are small.
- ii. It is difficult to find feasible projects.
- iii. Credits to small scale industries are high risk.
- iv. The number of branches of banks is limited and they do not cover the whole country.

(2) Recommendations

It is necessary to adopt the following measures to expand the credits to the small and medium scale industries:

- i. To widen the eligibility of KUK to medium scale industries.

The eligibility of KUK shall be modified for the industrial sector by increasing the

maximum limit of total assets and expanding the credit ceiling.

- ii. To introduce a two-step loan for the supporting industries.

Within an acceptable range of money supply, a liquidity credit program shall be re-introduced for the supporting industries. A two-step loan will be introduced in order to provide necessary funds for this program. This program will facilitate funds for the plant modernization by the supporting industries.

- iii. To establish a public financial institution specializing in finances for small and medium scale companies.

At the final stage, a public financial institution specializing in small and medium scale industries shall be set up. This institution will provide low-interest long- and medium-term credits for capital investments, leases for facilities and equipment, and funds for foreign experts. This institution will pool industrial credit specialists to promote project finding and reduce credit risks, which will result in a high efficiency of credits.

Human Resource Development

Measure 6: Expansion of Human Resource Development System

(1) Present Problems Regarding Human Resource Development

Human resource development is one of the most important areas in the development of the supporting industries. However, there are many problems concerning human resource development for the supporting industries.

Small and medium parts and components manufacturers have a problem of insufficient skilled labor because in-house human resource development systems are not established and working conditions are bad.

As for vocational training, public vocational training centers are insufficient in number, in facilities, and in curriculums. The vocational training is offered insufficiently not only for the supporting industries but for all the industries.

From the viewpoint of upgrading the technological level, production management, and R&D of the supporting industries, an insufficient supply of engineers and technicians is pointed out as a problem. In addition to the fact that the number of university graduates from engineering faculties is limited, most of them tend to go to a limited number of large enterprises, majority of which are foreign affiliated. This results in the insufficiency of personnel to work as engineers at small and medium scale industries.

Human resource development is a task to be tackled from the long-term viewpoint in order to upgrade the level of Indonesian industries and achieve a sustained growth of industries.

(2) Recommendations

- i. Establishment of a national-level vocational training system which responds to the needs of industries.

It is necessary to expand and enrich skill training in the areas highly needed by the industries. The Ministry of Manpower periodically monitors the needs of the industries and identifies training needs. It is essential to expand the vocational training system flexibly responding to these needs.

There are several technologies related to the supporting industries which are not sufficiently covered by the existing vocational training system. Examples are plastic molding, metal press, and die and mold designing. For these subjects of high needs, the training system including curriculum, equipment, and the level of instructors should be enriched by such organizations as CHEVEST.

The skill certification system hardly covers skills related to the supporting industries. In addition to the expansion of the training system, it is necessary, from the long-term perspective, to make the skill certification system cover skills related to the supporting industries. By certifying highly skilled personnel, the skill certification system can raise the position of skilled personnel, and furthermore, raise the skill level of the whole industry.

- ii. Expansion of vocational training centers

The modernization of existing vocational training centers is steadily promoted by the Ministry of Manpower. It is necessary to continue to this effort to expand and enrich the vocational training in such fields as metal processing and electronics, which are

highly demanded by the supporting industries.

At present, vocational training centers have introduced a dual training system which includes practice at companies in addition to training at centers. This should be expanded because this is effective from the viewpoint of practical vocational training.

iii. Expansion of employee training within the industries

Vocational training institutions operated by big enterprises possess abundant training know-how in the area of practical skills. It is useful to make these institutions open to the public and contribute to the improvement of employees' skills of the supporting industries. To provide engineers of the supporting industries with training courses for wide knowledge on technologies, even though that may be shallow, is effective to raise the technological level of the supporting industries. Therefore, such supports as tax incentives and/or subsidies should be given to the establishment of training institutions by private companies.

The promotion of vocational training by industrial organizations is also effective for skill development in the supporting industries. The implementation of skill training courses, and furthermore, the establishment of training schools should be promoted by trade associations. When they establish a training school, such support as the provision of training know-how and subsidies to employees to be sent for training should be introduced.

In the foundry industry, employees of small enterprises are trained by large enterprises with the mediation of the trade association and UPT. This is one attempt in line with large-scale enterprises' activities to support small enterprise. This type of training should be expanded to other industries.

iv. Training of engineers and technicians

The following should be promoted to develop engineers and technicians with engineering knowledge:

- Expansion and enrichment of engineer education at universities
- Establishment of vocational training institute at the same level with polytechnics
- Introduction of education and training programs for technician level personnel working at companies

Management Skills

Measure 7: Improvement of Managerial Skills

(1) Problems Regarding Management Skills

It is pointed out that many small and medium scale companies engaging in secondary and tertiary subcontracting do not have modern management systems. The reasons for this are that most of them are family businesses and top management are not properly educated modern management skills.

Local small and medium scale companies should acquire a modern management system when they grow in order to be strong parts and components manufacturers which can support assemblers. In the near future, their competition with foreign affiliated companies will be more severe because foreign investments in parts and components manufacture will increase. Local small and medium scale companies should rationalize their management with modern management skills to compete with foreign affiliated companies.

In line with the above, it is also important for the modernization of the industrial structure of supporting industries to create actively small and medium scale companies with entrepreneurship.

(2) Recommendations

i. Expansion of education and training of managers

Existing training schemes on managerial skill should be reviewed, and expand it according to the needs of companies. It is necessary to include managerial skill training which is practical to solve problems of small and medium scale enterprises besides managerial skill training for large scale companies.

It also needed to expand counseling activities by the departments related to the supporting industries and local offices within MOIT on management, including business planning, marketing, human resource management, and financing.

It would also be useful to open forums and meetings of managers of small and medium scale companies to study and exchange information on management modernization.

ii. Management modernization through management diagnosis and consulting

Continuous support by management advisors with consulting capabilities is effective in the management modernization of small and medium scale companies. They should conduct management diagnosis, and based on the results, continuously give top management advice on appropriate business planning and improvements in management.

It is necessary for departments related to the supporting industries to develop effective management guidance techniques and train necessary personnel engaging in management guidance.

iii. Support for entrepreneurs

It is necessary to establish a package of assistance provided to newly established businesses which consists of support by assemblers in the form of guidance and order, technological support by public institutions, and financial support. One way to support them is to select capable potential entrepreneurs and give them assistance during a limited period.

The possibility of preparing industrial apartment buildings for small and medium companies with low tenant fees should also be examined.

Industrial Infrastructure

Measure 8: Development of Industrial Infrastructure for the Supporting Industries

(1) Problems Regarding Industrial Infrastructure

The major problems from the viewpoint of foreign investments in the supporting industries are the preparation of industrial estates and preparation of good living conditions for foreigners. From the viewpoint of developing local parts and components manufacturers, major prerequisites are the preparation of industrial estates for SMIs and further development of infrastructure in local areas.

Treatment of waste water from factories is one problem in the area of industrial infrastructure. Only a few industrial estates have prepared water treatment facilities. In many cases, companies locating in industrial estates which may create water pollution are obliged to treat waste

water by themselves. However, there are still cases where the water is not properly treated because a water treatment facility is expensive for a company to afford.

(2) Recommendations

i. Promotion for the locating of supporting industries in specific industrial areas

It is important to introduce industrial area allocation policies in accordance with the development of strategic industries. Therefore, the development of industrial areas accumulating industries of essential technologies identified as priority in this Study should also be promoted.

The accumulation of small and medium scale companies in metal processing will be further promoted in the JABOTABEK area and its surrounding areas. It is necessary to establish a production division system and a network of mutual purchase and supply by setting up small and medium scale parts and components manufacturers in specific areas.

As for metal processing, such industrial areas as Ceper, Tegal, and Sukabumi, should be upgraded. Through the development of core companies, the overall level of these industrial areas will be increased. With this in mind, a support system including technological guidance should be prepared to support these areas as well as the upgrading of infrastructure such as electricity and roads.

The excess concentration of industries in the JABOTABEK area works against the diffusion of industries among regions, in addition to causing problems concerning manpower, roads and living conditions. It is necessary to tackle the problem of how to establish a vertical industrial structure from assemblers to parts and components manufacturers from a long-term perspective.

ii. Preparation of industrial estates for small and medium scale companies

It is difficult for local small and medium scale companies to move to industrial estates, even if their factories become old or too small for their operation, due to high tenant fees. It is necessary to prepare industrial estates for small and medium scale industries which they can afford to enter. This can promote the accumulation of industries in specific areas.

These industrial estates for SMIs will have the function of supporting small and medium

companies, for example, through the accommodation of such common facilities as water treatment facilities, machining facilities, and inspection facilities and the dispatch of technical advisors.

The establishment of industrial estates for SMIs was attempted through the setting-up of LIKs and UPTs. These industrial estate development could become more practical with the following measures:

- Target companies shall include capable medium scale companies.
- Technological advisory service functions which deal with technologies applicable to companies should be expanded.
- Common facilities which satisfy the needs of companies should be installed.

Measure 9: Rationalization of Tax and Tariff Systems and Realization of Quick Customs Clearance

(1) Problems of Tax and Tariff Systems

In Indonesia, it is said that high luxury taxes have restrained the growth of the domestic market for electric home appliances. Due to this, the home electric appliances industry could not enjoy economies of scale, and lowered the cost competitiveness. It has also made it difficult to promote investment and develop the parts and components industries. The problem of luxury tax is also debated in related to the nation car concept in the automotive industry.

As for import duties, since April, 1985, the Indonesian government has been introducing deregulation measures, particularly through the reduction in import duties and the abolishment of import surcharges. From the view of strengthening the international competitiveness of the Indonesian products, the reduction of import duties at a faster speed than that agreed in CEPT would be recommended.

In the customs clearance services in Indonesia, the government declared the termination of the consignment contract with PT. Surveyor Indonesia on April 1, 1997. Thus, the consignment customs clearance will be shifted to customs clearance by the government itself. The measures to achieve smooth transfer of this service or to further increase the efficiency of clearance procedures would be required.

(2) Recommendations

1) Review of Domestic Tax Systems

Luxury taxes shall be reexamined from the viewpoints of effects on industrial development, fairness, and effects on consumers.

The expansion of domestic market, especially, is an important factor for increasing the attractiveness of investments in Indonesia. Although Indonesia's income level is still relatively low compared with other ASEAN countries, its population is a big factor attracting investors. In addition, the expansion of the domestic market plays an important role in the supporting industries realizing the scale of economies and, as a result, cost competitiveness. From the above point of view, it is necessary to review domestic tax systems.

2) Improvement in Import Duty System

Even though the Indonesian government has been drastically reducing import tariffs, there are still some tariff-related problems to be solved. The tariff system should be modified from the following viewpoints:

- i. To unify import-related taxes.
- ii. To simplify and speed up customs clearance procedures by introducing a computer data processing system.
- iii. To integrate the taxation section and the refund section and to simplify and quicken tariff refund procedures.
- iv. To secure an accord between industrial policy and the tariff system

Marketing

Measure 10: Support for Domestic Marketing

(1) Problems Regarding Domestic Marketing

One of the bottlenecks of local parts and components manufacturers in expanding their businesses is insufficient marketing capability and lack of new customer development activities. Many small and medium scale companies have a passive attitude toward new customer development so that they make a prototype and cost estimate only upon an inquiry from a potential

customer.

It is necessary to secure sufficient orders to maintain the continuing growth of parts and components manufacturers. Supports for subcontractors in finding new customers, by providing necessary information and mediating services, is necessary.

(2) Recommendations

i. Support to parts and components manufacturers in finding orders from new customers

The following supporting activities should be provided:

- To support the preparation of a company's brochure and pamphlets
- To support the preparation of cost estimates
- To make standard models of contracts
- To open trade fairs
- To provide information on buyers' wants for parts and components purchase

ii. Preparation of a database on parts and components manufacturers

As for the database on small and medium scale parts and components manufacturers, the existing WARUSI should be continuously promoted. At the same time, a database specializing in the supporting industries covering large-scale parts and components suppliers, with more detailed information, should be developed for the business development of supporting industries.

The database will be developed by inputting with a unified form data of parts and components manufacturers collected by local offices of MOIT, local chambers of commerce and industry, and trade associations. The database will be equipped within MOIT and made open to the public, especially to buyers. The promotion of the database will also be made so as to encourage access from overseas

iii. Expansion of activities of mediating between suppliers and buyers of parts and components

Besides the provision of information based on the database mentioned above, business negotiations at occasions such as trade fairs will be supported by public organizations.

Measure 11: Support for Export Marketing

(1) Problems Regarding Export Marketing

Indonesia's exports of automotive parts and components can be classified into the following types:

| Type of Export | Exporter | Major Direction of Export | Key Factor for Export |
|--|--|-------------------------------------|---|
| Mutual complementation of parts and components by automobile manufacturers within the ASEAN region | - JV of foreign automobile manufacturers | ASEAN | International procurement policy of automobile manufacturers |
| Division of production within south-east Asian region and mutual supply by automotive parts and components manufacturers | - Foreign automotive parts and components manufacturers and its JV | South-east Asia | Promotion of investments by foreign automotive parts and components manufacturers |
| Exports of parts and components the production of which has lost cost competitiveness in the advanced countries to these countries | - JV of foreign automobile manufacturers - Foreign automotive parts and components manufacturers and its JV | Japan, Korea, USA | Promotion of investments by foreign automotive parts and components manufacturers |
| Exports of OEM parts and components | - JV of foreign automobile manufacturers - Foreign automotive parts and components manufacturers and its JV | Japan, South-east Asia, Europe, USA | Price, quality, technology including R&D |
| Exports of REM parts and components to after-sale markets | - JV of foreign automobile manufacturers - Foreign automotive parts and components manufacturers and its JV | Japan, South-east Asia, Europe, USA | Price, marketing activities, brand |

As for any type mentioned above, necessary conditions for exports are that products have enough cost competitiveness and satisfy a certain level of quality requirements.

(2) Recommendations

For the expansion of Indonesia's parts and components exports, the following export promotion measures are to be taken in addition to such measures to strengthen export product competitiveness.

- i. Expansion of public organizations' support for overseas marketing activities

- To strengthen the linkage between public organizations such as NAFED, and trade associations in export promotion activities. : Public organizations and trade associations should cooperate in such activities as participation in overseas trade fairs, dispatch of trade missions, and sales promotion to overseas potential buyers.
- To set up MOIT's offices in the ASEAN region to carry out export support activities. : They will collect information on parts and components which local assemblers want to buy, make sales promotion of Indonesian products, and provide support for marketing activities of Indonesian companies.

ii. Provision of information services on overseas markets by public organizations

- MOIT and trade associations should make comparative surveys concerning the export competitiveness of Indonesian products and identify products with export potential. Export promotion activities by individual companies and by trade associations will make use of the results of these surveys.
- To provide information on products which foreign buyers want to buy.

iii. Public support for export-oriented parts and components manufacturers

- To expand service facilities to companies locating in EPZs and EPTEs.
- To establish a quick customs clearance system for exports.
- To promote the acquisition of ISO 9000 series.

Investment Promotion

Measures 12: Expansion of Investment Promotion Activities

(1) Present Problems Regarding Investment Promotion Activities

A greater number of primary and secondary subcontractors with more capabilities in technologies and production capability are necessary to realize a higher level of competitiveness and value added of Indonesian automotive, electrical and electronic, and machinery industries. From this aspect, it is necessary to expand investment promotion activities. For the Indonesian electrical and electronics industry to establish a position as an exporting industry, more investments by foreign export-oriented parts and components manufacturers are required.

With a set of deregulation policies introduced by the government, foreign investments into the manufacturing sector in Indonesia have been spurred in the 1990s. Especially, foreign investments into the automotive, and electrical and electronic parts and components have been increased. However, if the present size and capabilities of the supporting industries for the automotive, electrical and electronics, and machinery industries in Indonesia are compared with those of other rival countries, it is clear that further investment promotion into these areas is an urgent task.

(2) Recommendations

i. Establishment of clear foreign investment policies

It is necessary to state clearly the time schedule of deregulation maintaining the existing deregulation policy. Business environments favorable to investors should be secured by maintaining the openness and fairness of investment and industrial policies.

ii. Implementation of investment promotion activities toward clarified targets

Many overseas parts and components manufacturers are also small and medium scale. Therefore, it is necessary to carry out investment promotion and provide investment supports which can match the needs of small and medium scale companies.

It is recommended that investment promotion activities be carried out, such as dispatch of investment promotion missions and invitation of potential investors, targeting foreign parts and components manufacturers producing priority products identified in this Study.

Leading foreign manufacturers of automotive, and electrical and electronic parts and components are establishing a system of a regional division of production within Asian region. Therefore, it is necessary to promote the investments into Indonesia by major parts and components manufacturers which have located in the ASEAN region.

Deliberate investment promotion should be carried out toward these companies after listing the target companies.

iii. Expansion of provision of information for investment promotion

It is necessary to set up a system which can provide foreign investors with information on local companies wishing a joint venture or technological collaboration with foreign com-

panies by preparing a database of this information. At the same time, the services of mediating foreign companies and local companies will be expanded.

iv. Provision of assistance to investments by foreign small and medium parts and components manufacturers

For the promotion of investments by small and medium scale parts and components manufacturers, a system facilitating their investments should be prepared such as a one-stop-service center dealing with all the investment procedures and industrial estates which provide common facilities.

4. PROPOSED ACTION PROGRAMS

For the implementation of the recommended overall development measures, it is necessary to give priority from the aspects of development needs and requirements by the industries. From this point of view, the following 14 action programs were selected from the recommended measures as those the implementation of which are to be started immediately.

Action Programs

- | | |
|-------------|---|
| Program 1. | Strengthening of IRDMMI's technical support capabilities for the foundry industry |
| Program 2. | Establishment of a joint R&D support scheme for small and medium scale industries |
| Program 3. | Program for expansion of technical guidance in local regions |
| Program 4. | Technical guidance visits to supporting industries by experts |
| Program 5. | Sub-contractor development program |
| Program 6. | Reinforcement of industry association activities |
| Program 7. | Loan scheme for the development of supporting industries |
| Program 8. | Establishment of advanced skill development center |
| Program 9. | Management skill training expansion program |
| Program 10. | Metal working industrial estate for small and medium scale industry development |
| Program 11. | Computerization of customs clearance procedures |
| Program 12. | Establishment of a subcontracting (business tie-up) promotion scheme |
| Program 13. | Intensification of parts export promotion activities |
| Program 14. | Expansion of capital and technical tie-up promotion activities |

The relationship between the overall development measures and responding action programs are as shown in Table 1-6. The brief outline of the proposed action programs were summarized in Table 1-7. Further, the urgency for the implementation for each program was evaluated from the view point of 1) the maturity of the project or the progress of preparation at its implementation agencies and 2) the extent of its impact for the supporting industry development. The results of the evaluation, as well as its rough implementation schedule, are summarized in Table 1-8.

Table 1-6 Action Programs Responding to Overall Development Measures

| Area | Measure | Content | Responding Action Programs |
|---|--|--|----------------------------|
| Institutional Policy Framework | 1: Preparation of the Institutional Framework for the Development of the Supporting Industries | (1) Establishment of Overall Supportive Measures for the Supporting Industries and Review of the Existing Small Industries Development Policies | - |
| | | (2) Establishment of an Organization for the Development of the Supporting Industries | - |
| Technical Support/ R&D Capability Improvement | 2: Improvement of Technological Level of the Supporting Industries | (1) Promotion of technological transfer from assemblers to their subcontractors | 5 |
| | | (2) Expansion of technical guidance by public institutions | 1, 3 |
| | | (3) Promotion of education and training on production management for engineers | 8 |
| | | (4) Expansion of activities of trade associations | 6 |
| | | (5) Mediation of technological tie-ups | 14 |
| | 3: Improvement of Quality Control | (1) Establishment of an institution which engages in the diffusion of quality control technologies | - |
| | | (2) Development of a quality control system suited to SMIs and preparation of an introduction manual for that system | 4 |
| | | (3) Organizing of personnel in charge of quality control | - |
| | | (4) Provision of information on quality control | - |
| | 4: Improvement of R&D Activities/ New Product Development Capabilities | (1) Promotion of the localization of the function of authorizing new parts and components at assemblers | - |
| | | (2) Expansion of facilities of R&D institutions under MOIT | 1 |
| | | (3) Promotion of joint R&D activities by the industry, public sector and academic sector | 2 |
| | | (4) Support for R&D by private companies | 2 |
| (5) Education and training for R&D personnel | | 2, 8 | |
| Financial Support | 5: Expansion of Finance to Small and Medium Industries | (1) To widen the eligibility of KUK to medium scale industries. | - |
| | | (2) To introduce a two-step loan for the supporting industries | 7 |
| | | (3) To establish a public financial institution specializing in finances for small and medium scale companies | - |
| Human Resource Development | 6: Expansion of Human Resource Development System | (1) Establishment of a national-level vocational training system which responds to the needs of industries | - |
| | | (2) Expansion of vocational training centers | - |
| | | (3) Expansion of employee training within the industries | 5, 6 |
| | | (4) Training of engineers and technicians | 8 |
| Managerial Skills | 7: Improvement of Managerial Skills | (1) Expansion of education and training of managers | 9 |
| | | (2) Management modernization through management diagnosis and consulting | 4, 9 |
| | | (3) Support for entrepreneurs | 4, 5, 9 |
| Industrial Infrastructure | 8: Development of Industrial Infrastructure for the Supporting Industries | (1) Promotion for the locating of supporting industries in specific industrial areas | 3 |
| | | (2) Preparation of industrial estates for small and medium scale companies | 10 |
| | 9: Rationalization of Tax and Tariff Systems and Realization of Quick Customs Clearance | (1) Review of Domestic Tax Systems a. To reduce luxury taxes on electric home appliances, except for high-grade products. b. To revise luxury taxes on automobile sales | - |
| | | (2) Improvement in Import Duty System a. To unify import-related taxes. b. To shift from consignment customs clearance to customs clearance by the government itself. c. To simplify and speed up customs clearance procedures by introducing an electric data processing system d. To integrate the taxation section and the refund section and to simplify and quicken tariff refund procedures. e. To secure an accord between industrial policy and the tariff system | 11 |
| Marketing | 10: Support for Domestic Marketing | (1) Support to parts and components manufacturers in finding orders from new customers | 12 |
| | | (2) Preparation of a database on parts and components manufacturers | 12 |
| | | (3) Expansion of activities of mediating between suppliers and buyers of parts and components | 12 |
| | 11: Support for Export Marketing | (1) Expansion of public organizations' support for overseas marketing activities | 13 |
| | | (2) Provision of information services on overseas markets by public organizations | 13 |
| Investment Promotion | 12: Expansion of Investment Promotion Activities | (3) Support for export-oriented parts and components manufacturers | - |
| | | (1) Establishment of clear foreign investment policies | 14 |
| | | (2) Implementation of investment promotion activities toward clarified targets | 14 |
| | | (3) Expansion of provision of information for investment promotion | 12, 14 |
| | | (4) Provision of assistance to investments by foreign small and medium parts and components manufacturers | 10, 12, 14 |

Table 1-7 SUMMARY OF THE PROPOSED ACTION PROGRAMS

| No. | Program Title | Objectives | Contents of the Program | Existing Related Organizations | Role of the Government | Cooperation from Overseas |
|-----|---|--|--|--|---|--|
| 1. | Strengthening of IRDMMI's Technical Support Capabilities for the Foundry Industry | The objective of the project is to strengthen IRDMMI's capability in giving all necessary technical services to the supporting industries. At its first stage, the specific emphasis would be placed on the casting and die casting technologies, so that the domestic industries could supply quality casting products for the automotive industry. | <ol style="list-style-type: none"> 1) Transfer of such technologies as pattern making, molding/casting design, casting defects analysis, foundry metallurgy, die casting, die making through hardware and software assistance, and the overseas training of IRDMMI staff. 2) Implementation of the assistance to the foundry industries in two areas of West Java including Jabotabek and East Java. | <ol style="list-style-type: none"> 1) The Institute for Research and Development of Metal and Machinery Industries (IRDMMI / MIDC) 2) Agency for Industrial and Trade Research and Development | <ol style="list-style-type: none"> 1) Renovation and expansion of existing casting facilities making use of the ADB loan. 2) Renovation of existing MIDC's foundry shop building 3) Assignment of MIDC staff members | <ol style="list-style-type: none"> 1) Dispatch of long-term and short-term foreign experts (Total number is around 6 - 8.) 2) Overseas training of MIDC staff members 3) Installing of additional machinery and equipment |
| 2. | Establishment of a Joint R&D Support Scheme for Small and Medium Scale Industries | The major objective is to accumulate the experience of R&D activities for engineers of SMI, as well as to promote the R&D work for the common needs of the industry. | <ol style="list-style-type: none"> 1) The R&D targets are selected mainly by the industrial associations, a group of companies, public R&D support organizations or universities. 2) A governmental matching grant is offered for the above R&D implementation which fits the common needs of the industry. | <ol style="list-style-type: none"> 1) Agency for Industrial and Trade Research and Development 2) Other agencies and directorates of MOIT, which are in charge of SMI development 3) Various kinds of industrial associations | <ol style="list-style-type: none"> 1) Establishment of "SMI Joint R&D Support Fund" 2) Establishment of an administration office of the Project. | <ol style="list-style-type: none"> 1) Loan for "SMI Joint R&D Support Fund" |
| 3. | Program for Expansion of Technical Guidance in Local Regions | The objective is to introduce an integrated technical service system for regional production bases of metal processing. | <ol style="list-style-type: none"> 1) Technical support service centers will either be newly established or established through the expansion of existing UPTs. 2) The above centers will engage in such activities as technical guidance, marketing and management support or the training and education of workers of the local SMIs. | <ol style="list-style-type: none"> 1) Agency for Small Scale Industries Agency for Industrial and Trade Research and Development 2) IRDMMI(MIDC) / B4T 3) Local offices of MOIT | <ol style="list-style-type: none"> 1) New establishment or expansion of technical service centers. 2) Allocation of technical support service staff members. | <ol style="list-style-type: none"> 1) Dispatch of long-term and short-term foreign experts 2) Supply of equipment |
| 4. | Technical Guidance Visit to Supporting Industries by Experts | The objective of the program for expansion of technical guidance in local regions is to introduce an integrated technical service system to regional production bases of metal processing where it can be a part of the supporting industries and to upgrade the technological level of metal processing industries. | <ol style="list-style-type: none"> 1) Finding of market needs and selection of target companies to support 2) Coordination of contents of supporting activities with related technical supporting organizations 3) Implementation of support services and following-up of the supporting activities | <ol style="list-style-type: none"> 1) Agency for Industrial and Trade Research and Development 2) IRDMMI(MIDC) / B4T 3) Center for Data and Information 4) Various kinds of industrial associations | <ol style="list-style-type: none"> 1) Establishment of a secretariat office for coordination of the all related activities 2) Assignment of staff members for the secretariat office | <ol style="list-style-type: none"> 1) Dispatch of long-term and short-term foreign experts 2) Coordination of the implementation of existing activities such as JETRO or JODC schemes. |

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| No. | Program Title | Objectives | Contents of the Program | Existing Related Organizations | Role of the Government | Cooperation from Overseas |
|-----|--|--|---|--|--|--|
| 5. | Sub-contractor Development Program | The program will assist and promote the development of sub-contracting business between large-scale assemblers and potential suppliers by providing incentives and various facilities. | <ol style="list-style-type: none"> 1) Tripartite group of parent company, potential sub-contractors and financial institutions are formed for the sub-contractor development. 2) Parent companies formulate sub-contractor development plans 3) Parent companies give various kinds of technical assistance to potential sub-contractors. 4) Financial institutions provide loans to potential sub-contractors, if necessary. | Directorates responsible for the subject industries under the sectoral Directorate General concerned in MOIT | <ol style="list-style-type: none"> 1) Establishment of a Sub-contractor Development Committee 2) Investigation of tax incentives for assemblers' expenses for the support to potential sub-contractors 3) Investigation of possibilities for other public organizations to participate in the program | <ol style="list-style-type: none"> 1) Dispatch of long-term foreign experts of SMI development strategies |
| 6. | Reinforcement of Industry Association Activities | The major objectives are 1) to promote the mutual edification of managers of member companies, 2) to strengthen the communication network with related governmental organizations or overseas industry associations, and 3) to achieve the sound development of all member companies | <ol style="list-style-type: none"> 1) By establishing a capable administration office of each association, the participation rate will be improved and financial bases be solidified. 2) By expanding industry association activities, the merits of participation in associations will be increased and the group consciousness of member companies be strengthened. | <ol style="list-style-type: none"> 1) Directorates responsible for the subject industries under the sectoral Directorate General concerned in MOIT 2) Various kinds of industrial associations | <ol style="list-style-type: none"> 1) Permission for the priority use of public facilities by industrial association activities 2) Priority application of various support programs conducted by the public sector 3) Assignment of contract services for the government | <ol style="list-style-type: none"> 1) The promotion of various tie-up programs with overseas related industrial associations or other organizations such as JETRO in Japan. |
| 7. | Loan Scheme for the Development of Supporting Industries | The objective is to support local supporting industries to upgrade their production facilities through the introduction of a specific institutional loan scheme. | <ol style="list-style-type: none"> 1) A specific institutional financing scheme to supply soft-term loans for SMI's capital investments will be established making use of funds from international financial institutions. 2) The technical service activities will be strengthened for the loan target SMIs. | <ol style="list-style-type: none"> 1) Bank Indonesia 2) National Banks, Commercial Banks and Regional Development Banks 3) Various sectoral Directorate General concerned in MOIT | <ol style="list-style-type: none"> 1) Preparatory study on the introduction of a new institutional loan program 2) Negotiation for the introduction of two-step loans from international financing institutions | <ol style="list-style-type: none"> 1) Implementation of the F/S for the introduction of a new institutional loan program 2) Supply of two-step loans |
| 8. | Establishment of Advanced Skill Development Center | The object is to train and educate engineers and technicians by setting up advanced skill development centers which target specific technologies which are highly required by the private sector, especially the automotive, electrical and electronic, and machinery industries. | <ol style="list-style-type: none"> 1) Training centers are set up as a joint effort by both the public and private sectors. 2) To conduct pre-employment training to produce highly skilled technicians with engineering knowledge. 3) To conduct post-employment training to achieve an immediate skills and knowledge upgrading of company workers. 4) To provide seminars on latest technologies. | <ol style="list-style-type: none"> 1) Regional government, MOIT Regional offices, IRDMMI, CEVEST 2) ITB, Swiss Polytechnik, etc. 3) Various kinds of industrial associations, private companies | <ol style="list-style-type: none"> 1) Basic planning 2) Provision of land and building for the center 3) Support for operating expenses 4) Support for curriculum development and dispatch of instructors 5) Training of instructors | <ol style="list-style-type: none"> 1) Conduct of a master plan study 2) Dispatch of foreign training experts 3) Supply of training equipment |

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| No. | Program Title | Objectives | Contents of the Program | Existing Related Organizations | Role of the Government | Cooperation from Overseas |
|-----|---|--|---|---|---|--|
| 9. | Management Skill Training Program | The main objective is to expand the training of: 1) managers of small and medium enterprises, and 2) government officers in charge of guidance for small and medium industries under MOIT and the Ministry of Cooperatives and Small Enterprise. | 1) The training function of PUSBINLAT under MOIT for management know-how will be expanded. 2) The management consulting function will be newly attached to PUSBINLAT. | Center for Skill and Vocational Training Development (PUSBINLAT) | 1) Expansion of facilities and staff members of PUSBINLAT 2) Training of the staff members of PUSBINLAT in charge of management consulting 3) Establishment of a management consulting section in PUSBINLAT | 1) Dispatch of long-term and short-term foreign experts 2) Overseas training of the teaching and consulting staff of PUSBINLAT |
| 10. | Industrial Estate Development for Small and Medium Scale Industry Development | By developing industrial estates for SMIs, which is fully equipped with all of the necessary infrastructure for the satisfaction of both domestic and overseas investors, the industrial structure will be strengthened and domestic parts supply ratio will be increased. Further, the development of production and management technology will also be achieved within the estate by fostering the business linkages between foreign affiliated and local companies. | 1) Industrial estates which are fully equipped with all of the necessary infrastructure for the small and medium scale metal working industry will be established. 2) By strengthening the investment support services in both newly developed and existing industrial estates, the investment of both local and overseas manufacturers are promoted to invest in the supporting industries. | Center for Research and Development of Resources, Industrial Location and Environment, Agency for Industrial and Trade Research and Development | 1) Implementation of a ground design study 2) Establishment of a public and private joint implementation organization 3) Infrastructure construction and facility development 4) Support services to establish companies | 1) Implementation of a ground design study 2) Dispatch of long-term and short-term foreign experts having experience in the development of industrial estates for SMIs. |
| 11. | Computerization of Customs Clearance Procedures | The objective is to secure the smooth flow of import and export goods by computerization of clearance procedures. | 1) A computer system for customs clearance will be introduced. 2) The customs clearance operations will be simplified. 3) Other related operations such as tax draw back of re-exports will also become smooth. 4) Trade and revenue statistics will be prepared in time. | Directorate General of Customs and Excise, Ministry of Finance | 1) Establishment of a model plan for model areas 2) Development of a computer software 3) Establishment of nationwide computer network system | 1) Master plan study for the establishment of a model computer system |
| 12. | Establishment of a Subcontracting (Business Tie-up) Promotion Scheme | The objective is to promote the linkage between potential SMI sub-contractors and large scale industries, through 1) the establishment of a data base, and 2) to extend matching services for the promotion of sub-contracting transactions. | 1) A data base network will be established which maintains a registry of SMIs having the potential to become sub-contractors and large scale companies interested in contracting out the supply of parts and components. 2) Matching services for the promotion of sub-contracting transactions will be extended. | 1) Various sectoral Directorates General concerned in MOIT 2) Agency for Industrial and Trade Research and Development 3) Agency for Small Scale Industries 4) Center for Data and Information 5) Various industrial associations | 1) Study of the needs of the industry 2) Establishment of a data base 3) Establishment of an organization which can maintain the data base and conduct various matching service activities | 1) Implementation of a master plan study for the establishment of a data base network |

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| No. | Program Title | Objectives | Contents of the Program | Existing Related Organizations | Role of the Government | Cooperation from Overseas |
|-----|--|--|--|--|---|--|
| 13. | Intensification of Parts Export Promotion Activities | The major objective of the program is to increase the effect of existing promotion activities for industrial parts exports, through integrating the activities of both public and private sectors, and strengthening and expanding the range of existing programs. | <ol style="list-style-type: none"> 1) The export promotion activities conducted by both public and private sectors will further be integrated. 2) The activities of NAFED will be expanded. 3) The support activities for the development and improvement of export products will be expanded. | <ol style="list-style-type: none"> 1) National Agency for Export Development (NAFED) 2) Various sectoral Directorates General concerned in MOIT 3) The Indonesian Chamber of Commerce and Industry (KADIN) 4) Various kinds of industrial associations | <ol style="list-style-type: none"> 1) Establishment of a coordinating committee which will coordinate all of the public and private export promotion activities. 2) Expansion of existing export promotion schemes. | <ol style="list-style-type: none"> 1) Tie-up activities with overseas trade promotion organizations such as JETRO in Japan. 2) Overseas training of the staff of NAFED |
| 14. | Expansion of Capital and Technical Tie-up Promotion Activities | The objective is to strengthen the investment promotion and capital and technical tie-up promotion activities toward potential overseas parts and components manufacturers by expanding existing schemes of BKPM, MOIT or other related organizations. | <ol style="list-style-type: none"> 1) The restrictions on foreign investments will further be mitigated. 2) The one-stop agency service functions will be expanded. 3) Investment related information service function will be expanded. 4) Information on foreign industries and corporations will be collected and provided to local companies. 5) Strengthen the activities of dispatching and accepting overseas missions, and sponsoring seminars. 6) The cooperation efforts with ASEAN countries will be intensified. | <ol style="list-style-type: none"> 1) The Investment Coordinating Board (BKPM) 2) Various sectoral Directorates General concerned in MOIT 3) Various kinds of industrial associations | <ol style="list-style-type: none"> 1) Promotion of further deregulation of the foreign investment and foreign trade related activities. 2) Assistance for the strengthening of existing investment promotion schemes. | <ol style="list-style-type: none"> 1) Cooperation with overseas investment promotion related organizations such as JETRO in Japan.. |

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Table 1-8 Priority and Implementation Schedule of the Proposed 14 Action Programs

| Program Title | Priority of Implementation | Implementation Process | Implementation Schedule | | | | |
|--|----------------------------|---|-------------------------|----------|----------|----------|----------|
| | | | 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year |
| P1. Strengthening of IRDMMI's Technical Support Capabilities for the foundry | A | 1. Technical training 2. Technical guidance 3. Seminars and training courses | | | | | |
| P2. Establishment of a joint R&D support scheme for SMIs | B | 1. Application of DAPATI 2. Establishment of support fund 3. Support implementation | | | | | |
| P3. Program for expansion of technical guidance in local regions | B | 1. Planning 2. Training of trainers 3. Implementation of guidance | | | | | |
| P4. Technical guidance visits to supporting industries by experts | B | 1. Establishment of ISC 2. A secretariat office establishment 3. Coordination of visit guidance | | | | | |
| P5. Sub-contractor development program | A | 1. Preparatory study 2. Pilot program implementation 3. Promotion of the program | | | | | |
| P6. Reinforcement of industry association activities | B | 1. Expansion of current activities 2. Governmental support measures 3. Tie-up with overseas organizations | | | | | |
| P7. Loan scheme for the development of supporting industries | A | 1. Preparatory study 2. Original loan negotiation 3. Implementation of two-step loans | | | | | |
| P8. Establishment of advanced skill development centers | B | 1. Preparatory study 2. Establishment of centers 3. Implementation of training | | | | | |
| P9. Management skill training expansion program | C | 1. Curriculum development 2. Implementation of training 3. Provision of consulting services | | | | | |
| P10. Industrial estates development for the supporting industries | A | 1. Grand designing 2. New estates development 3. Upgrading of existing estates | | | | | |
| P11. Computerization of customs clearance procedures | A | 1. Model program development 2. Program development 3. A national network building | | | | | |
| P12. Establishment of a sub-contracting (Business tie-up) promotion scheme | A | 1. Study for designing 2. Data base establishment 3. Matching service activities | | | | | |
| P13. Intensification of parts export promotion activities | C | 1. Intensification of joint efforts 2. Expansion of NAFED 3. Export product development | | | | | |
| P14. Expansion of capital and technical tie-up promotion activities | A | 1. Promotion of deregulation 2. One-stop service activities 3. Investment promotion activities | | | | | |

A : Implementation urgency is very high. B : Urgency is moderate. C : Urgency is not very high.



II. PRESENT SITUATION OF THE TARGET INDUSTRIES

1. THE AUTOMOTIVE PARTS INDUSTRY IN INDONESIA

(1) Automotive Industry

Assembly of motor cars was started in Indonesia after the Indonesian government introduced the automotive industry policy which banned imports of CBU in 1974. In addition, the government introduced an automotive local content policy which aimed at the complete localization of commercial cars in the future, and designated a selected number of automotive parts and components for localization. According to this policy, certain parts and components were scheduled to be procured locally item by item.

In the case of motorcycles, imports from Japan started in the 1950's. However, localization of parts and components for motorcycles was regulated by governmental guidance in 1970. Afterwards, assembly of engines was started in 1981 and the government promoted a localization schedule of important engine parts in 1987.

In June, 1993, however, the Indonesian government changed its automotive industry policy completely and introduced a new policy which consisted of the liberalization of CBU imports and a decrease in import duties and luxury taxes for parts and components. As a result, imports of CBU became possible just by paying import duties. In addition, the deregulation movement, reflected in the above-mentioned lowered import duties, has been accelerating the entrance of foreign automotive manufacturers into the market.

The annual production volume of cars has been increasing rapidly since 1993, though it decreased from the level of the previous year in 1992.

Table 2-1 Automotive Production Volume by Category

(Unit: Sets)

| | 1991 | 1992 | 1993 | 1994 | 1995 |
|-----------------|---------|---------|---------|---------|---------|
| Commercial cars | 207,763 | 152,866 | 172,006 | 283,114 | 347,702 |
| Sedans | 46,974 | 29,368 | 31,582 | 41,807 | 39,839 |
| Total | 254,737 | 172,234 | 203,588 | 325,021 | 387,541 |

Source: GAIKINDO

The production volume of the motorcycle industry by brand in Indonesia is shown in Table 2-2. Three major brands, Honda, Yamaha and Suzuki, occupy 95% of the total production, and Honda occupies approximately 50% of the total.

Table 2-2 Production Volume of Motorcycle by Brand

(Unit: Sets)

| | 1991 | 1992 | 1993 | 1994 | 1995 |
|----------|---------|---------|---------|---------|-----------|
| HONDA | 254,456 | 264,336 | 365,096 | 425,485 | 520,521 |
| YAMAHA | 101,650 | 122,645 | 162,900 | 211,000 | 261,868 |
| SUZUKI | 76,400 | 86,839 | 78,054 | 128,284 | 211,655 |
| KAWASAKI | - | - | - | - | 25,202 |
| VESPA | 12,762 | 14,704 | 15,035 | 16,635 | 23,692 |
| TOTAL | 445,268 | 488,524 | 621,085 | 781,404 | 1,042,938 |

Source: MOIT

(2) Automotive Parts and Components Industry

Indonesia's automotive parts and components industry has developed along with the government's policy for localizing production. According to data from the MOIT, the number of companies manufacturing automotive parts in Indonesia in 1995 was 131 (as opposed to 124 in 1994), while the number of types of parts being manufactured was 43 (the same as in 1994). According to the directory 1996/97 of GIAMM (Association of Automotive Parts Manufacturers), 115 companies are registered as its members.

In the latter half of the 1970s, Indonesia adopted a policy of localizing the production of parts and components. Called a "deletion program," this policy deleted, in stages, a selected number of parts and components from CKD items, which then automatically became parts and components to be produced locally and not to be imported. In the 1980s, in accordance with this policy of promoting local production of designated parts and components, more than 90 automotive parts and components, including engine parts, were added to the list of designated items, in addition to those which were already designated in the 1970s. The designated automotive parts and components of those days can roughly be divided into two categories: One consists of parts and components with superior cost competitiveness: tires and other rubber products, seats, batteries, spark plugs, wheel rims, pistons, shock absorbers, etc. The other consists of parts and components that were added to the list as a result of the government's policy to promote the production of key parts: parts and components related to those

components as engines, transmissions, brake systems, chassis, steering systems, etc.

In June 1993 the government began a thorough revision of its localization policy. The new policy did away with the compulsory use of parts and components designated for local production, allowing manufacturers to instead choose which locally made parts and components to use. On the other hand, under the new policy, the local content ratio of parts and components and the local content ratio of added value are calculated for each type of car and each of the main parts and components. Then, based on those ratios, import duties and luxury taxes are imposed and incentives are provided for fields in which investment is prohibited.

Under the old localization policy for automotive parts and components, foreign parts and components manufacturers who entered Indonesia did so mainly to manufacture designated parts and components. From 1990 through 1993, the volume of spark plugs, V-belts, brake systems, gaskets, control cables, seats, pistons, shock absorbers, etc., that were produced locally continued to increase. Engines, transmissions, chassis and frames, etc., provided the greatest revenue. However, since the new policy, with its Localization Point System, went into effect in 1994, the annual quantity of parts produced, measured according to the value of production in 1993, increased by a factor of 1.46 in 1994 and a factor of 2.00 in 1995 (by a factor of 1.37 from 1994), according to the data provided by MOIT. During this period, the components whose local production increased the most included clutch systems, brake drums, chassis and frames, exhaust systems, pistons, fuel tanks, etc.

Table 2-3 shows the growth in local content for each category of cars from 1994 to 1996.

Table 2-3 Progress of Local Content in Car Production

(Unit: Points)

| No. | Category | Year | | |
|-----|----------------|---------------|---------------|---------------|
| | | 1994 | 1995 | 1996 |
| 1 | PASSENGER CAR | 5.00 - 42.96 | 5.02 - 42.24 | 6.38 - 42.15 |
| 2 | COMMERCIAL CAR | 12.20 - 51.02 | 5.39 - 48.14 | 5.47 - 45.39 |
| | - CATEGORY II | 21.60 - 37.50 | 23.40 - 33.67 | 22.00 - 33.97 |
| | - CATEGORY III | 24.87 - 36.32 | 29.27 - 35.06 | 22.52 - 34.82 |
| | - CATEGORY IV | 1.00 - 31.99 | 2.20 - 30.79 | 2.20 - 30.16 |

Source: MOIT

Table 2 - 4 summarizes the representative automotive parts and components which are manufactured by a relatively large number of manufacturers in Indonesia.

Table 2-4 Number of Manufacturers of Representative Parts and Components for Cars

| Name of parts and components | Number of manufacturers | Name of parts and components | Number of manufacturers |
|------------------------------|-------------------------|------------------------------|-------------------------|
| Engines | 10 | Brake System & Parts | 13 |
| Alternators | 4 | Chassis & Body | 14 |
| Cylinder Blocks | 5 | Suspension Parts | 8 |
| Gaskets | 5 | Shock Absorbers | 5 |
| Motor Starters | 3 | Fuel Tanks | 8 |
| Pistons & Piston Rings | 6 | Mufflers & Exhaust Pipes | 14 |
| Radiators | 5 | Seats & Seat Frames | 9 |
| Spark Plugs | 4 | Wheel Rims | 10 |
| Transmissions | 5 | Wiring Harnesses | 5 |
| Drive Axles | 3 | Door Trims | 5 |
| Steering System & Parts | 9 | Reclining Seats | 4 |
| Clutch System & Parts | 5 | Air Conditioners | 3 |

Source: MOIT, Domestic Production Value of Automotive Parts and Components

The total production value of automotive parts and components decreased from the previous year in 1992, but it has been increasing since 1993. Especially in 1994 and 1995, in response to the rapid expansion of domestic automotive production, the production value of automotive parts and components increased greatly.

In 1995, automotive parts and components which are the largest in production value are engines, followed by transmissions, wheel rims, seats and seat frames, chassis frames, steering systems and brake systems. Especially, engines occupy more than 30% of the total production value of automotive parts and components.

Table 2-5 Domestic Production Value of Automotive Parts and Components
(Unit: Rp. Million)

| | 1991 | 1992 | 1993 | 1994 | 1995 |
|-------------------------|-----------|-----------|-----------|-----------|-----------|
| Engines | 620,161 | 434,113 | 455,838 | 618,395 | 768,231 |
| Transmissions | 142,119 | 106,590 | 111,919 | 155,288 | 193,943 |
| Wheel rims | 67,513 | 55,222 | 57,983 | 109,979 | 137,207 |
| Seats/seat frames | 44,208 | 33,864 | 35,557 | 9,750 | 131,157 |
| Chassis Frames | 88,292 | 66,219 | 69,529 | 101,914 | 128,375 |
| Steering systems | 87,443 | 65,582 | 70,861 | 100,144 | 125,914 |
| Brake systems | 63,612 | 47,709 | 50,095 | 74,964 | 102,451 |
| Air conditioners | 30,224 | 57,654 | 60,536 | 68,732 | 89,932 |
| Cabins | 63,652 | 47,739 | 50,126 | 68,664 | 88,901 |
| Axles, propeller shafts | 44,490 | 33,368 | 35,036 | 55,635 | 75,275 |
| Leaf springs | 34,951 | 26,214 | 27,525 | 51,102 | 67,455 |
| Wire harnesses | 23,885 | 17,914 | 18,810 | 22,310 | 61,595 |
| Clutch systems | 20,171 | 15,129 | 15,885 | 41,160 | 61,152 |
| Brake drums | 10,795 | 8,096 | 8,501 | 40,000 | 48,960 |
| Cable controls | 55,085 | 27,638 | 29,810 | 37,389 | 45,989 |
| Starters | 22,749 | 17,062 | 17,915 | 30,188 | 45,758 |
| Spark plugs | 29,648 | 24,950 | 26,198 | 34,205 | 45,151 |
| Alternators | 23,391 | 17,544 | 18,421 | 24,696 | 40,191 |
| Exhaust systems | 5,412 | 4,059 | 4,262 | 31,673 | 36,234 |
| Pistons | 3,038 | 2,138 | 2,245 | 26,745 | 36,106 |
| Radiators | 18,922 | 16,264 | 17,077 | 27,219 | 34,791 |
| Shock absorbers | 29,207 | 21,905 | 23,000 | 27,382 | 33,772 |
| Filters | 18,556 | 13,918 | 14,622 | 21,609 | 30,258 |
| Rubber parts | 13,310 | 9,986 | 10,484 | 16,834 | 25,779 |
| Fuel tanks | 10,397 | 7,798 | 8,188 | 18,637 | 24,712 |
| Rear body | 14,844 | 11,133 | 11,690 | 16,507 | 21,372 |
| Brake, fuel tube | 8,376 | 6,282 | 6,546 | 10,684 | 17,399 |
| V-belts | 10,223 | 7,856 | 8,248 | 9,535 | 11,187 |
| Brake linings | 4,222 | 3,164 | 5,181 | 7,771 | 10,102 |
| Piston rings | 3,238 | 2,429 | 2,550 | 3,568 | 4,520 |
| Horns | 1,216 | 912 | 958 | 2,860 | 4,150 |
| Gaskets | 953 | 715 | 750 | 2,160 | 3,645 |
| Washer tanks | 925 | 973 | 1,022 | 1,842 | 3,223 |
| Jacks | 1,025 | 768 | 807 | 1,376 | 2,202 |
| Total | 1,646,253 | 1,212,907 | 1,278,175 | 1,870,917 | 2,557,089 |

Source: MOIT

(3) Priority Parts and Essential Technologies

The selection work of priority products and essential technologies to be developed in Indonesia was conducted based on the following screening process.

- 1) Identification of major automotive parts and components manufacturers in Indonesia;
- 2) Identification of major parts manufactured in Indonesia, and the level of local procurement for each item ;
- 3) First screening of major evaluation target parts, making use of such factors as the weight of each parts in the total production cost of finished products identified by the local contents point table or the level of technology required for the manufacturing of each parts;
- 4) Identification of priority products making use of a major parts evaluation table, which uses the following factors as screening criteria:
 - a. Economic impact
 - Contribution to the progress of local parts procurement
 - Import substitution effect
 - b. Technical impact
 - Technical difficulties
 - Influence for other parts production
 - c. Ease of market participation
 - Possibility of mutual production
 - Development of related technologies in Indonesia
 - Minimum economic production scale
 - d. International Competitiveness
 - Availability of local parts and materials
 - Labor-intensive level of production
 - Possibility of mass production in Indonesia
- 5) Identification of elemental technologies needed for the manufacture of priority products identified in 4) above; and
- 6) Identification of priority products and essential technologies in matrix form.

Through the above screening process, the following priority parts and components and essential technologies were selected.

Group 1 (11 parts and components): Crucial parts and components which are recognized as key parts for localization by assemblers.

- **Engine parts and components (4):** Alternators, Camshafts, Connecting Rods, Motor Starters
- **Transmission parts and components (4) :** Extension Housings, Gears, Input shafts/Main Shafts, Shift Forks/Speed Shaft Rails
- **Drive axle parts and components (2) :** Drive Shafts, Propeller Tubes
- **Brake parts and components (1) :** Backing Plates/Body Calipers

For the localization of Group 1 products, the needs for casting and forging parts and components are especially high. For this, improvement of casting and forging technology is indispensable. The most important key technologies are forming and manufacturing technology of cores for casting parts, and surface hardening and die repairing technology for forging parts. In addition, development of the heat and surface treatment industry is necessary for localization of gears and shafts.

Group 2 (8 parts and components): Parts and components which have the potential to be competitive in the international market in the future and need to be localized.

- **Engine parts and components (2) :** Pistons & Piston Rings, Radiators
- **Transmission parts and components (3) :** Cases, Clutch Housings, Covers
- **Suspension parts and components (1) :** Shock Absorbers
- **Universal parts and components (2) :** Safety Glasses, Air Conditioners

For the group 2 products, the needs for improvement of casting and forging parts and components are also very high, and improvement of related technology is indispensable. Particularly important key technologies are forming of cores and assembling in casting, and heat treatment technologies for surface hardening and die repairing technology for forging. In the case of shock absorbers, they are already competitive in the international market. However, cost reduction of parts, above all, of material costs which occupy a large part of the total production costs is necessary for further expansion of exports in the future.

Group 3 (9 parts and components): Parts and components which have already been exported but need to be more competitive for the further expansion of market.

- **Engine parts and components (3)** : Air Filters, Fuel Filters, Oil Filters
- **Clutch parts and components (1)** : Facings
- **Universal parts and components (5)** : Batteries, Control Cables, Electric Parts, Tires, Wiring Harnesses

For increasing the competitiveness of Group 3 products in the international market, improvement of automation technology for stable quality and design technology of jigs and fixtures for efficiency is necessary for the establishment of mass production technology. As for die manufacturing and factory control technology, strengthening of rationalization technology and methods which are suitable for repeated production such as quality control, cost control and reduction of lead time in addition to rationalization of production equipment and improvement of maintenance technology are necessary.

Further, one of the characteristics of the automotive industry is that not only is its industry size measured by assemblers' total production value very large, but also it has a wide expanse of supporting industries. In the case of a leading Japanese automotive assembler, for example, the number of primary subcontractors is about 350, while that of secondary subcontractors is estimated at 2,000 and that of tertiary, over 10,000. From the case of the automotive industry of advanced countries, the types of production processes that these secondary and tertiary subcontractors undertake are a) casting, b) forging, c) heat treatment, d) surface treatment, e) press, f) machining, g) die and mold making, h) jig and fixture making, etc., which are more or less overlapping with those of primary subcontractors.

In Indonesia, on the other hand, the total number of primary subcontractors is only about 60 including 21 Astra Component Group companies even in the largest automotive assembler, PT. Toyota-Astra Motor. Although there is no exact estimation, the number of secondary subcontractors is very limited and their company size, technology and management levels are much lower than those of the primary ones. Further, there are no recognized tertiary subcontractors. Most of the primary subcontractors are either joint venture companies with foreign manufacturers or Indonesian manufacturers which have technical collaboration agreements with foreign manufacturers. The reasons that the primary subcontractors use the secondary ones are lack of technology and high costs in the case of in-house production, followed by insufficient pro-

duction capacity and small production lots.

Also, the development of these secondary and tertiary subcontractors would help development of the primary subcontractors and then become one of the key factors for the successful development of all of Indonesian industry. It is urgent that the technical levels in the above process areas should be enhanced to bring about successful industrial development in Indonesia. For most of the local manufacturers who intend to enter the market, the major areas that they should aim at would rather be those which should be undertaken by secondary and tertiary subcontractors.

2. THE ELECTRICAL AND ELECTRONICS PARTS INDUSTRY IN INDONESIA

(1) The Electrical and Electronics Industry

The history of the industrial development of the electrical and electronics industry in Indonesia is broadly divided into two stages: the import substitution development era until the late 1970s, and the export oriented development era after the late 1970s. The import substitution development era corresponded to the latter period of the First Five-year Development Plan era (REPELITA I: 1969/70 to 1973/74) to the Third Five-year Development Plan era (REPELITA III: 1979/80 to 1983/1984). During the period, the Indonesian government took active measures to invite foreign investments in order to replace imported products with domestic products. Then, many foreign electrical and electronic companies from Japan, Korea, the USA and Europe invested in the country. Especially, Japanese large-scale assemblers actively made investments in this era. For example, both Matsushita Electric Industrial Company and Sanyo Electric Company established joint venture companies in 1970. In this way, many joint venture companies were established in Indonesia, and they began the production of a wide range of electrical and electronics products, aiming at the Indonesian domestic market. However, the assemblers of electrical and electronic products imported almost all the parts and components which were used for the assembling of finished products.

In middle 1970s, the government changed its policy from the active introduction of foreign investments to the selective introduction. Subsequently, foreign investments dropped, and only a few investments were approved after the middle 1970s. In the early 1990s, however, the government took another policy, by which the export of products other than oil or gas was encouraged so that the country could break away from the heavy dependence of its economy on oil and gas. In line with the policy, various regulations concerning the electrical and electronic industry were relaxed or abolished, and, subsequently, active investments by multinational companies into Indonesia returned.

In 1994, the environment surrounding foreign investments again changed substantially, in that investments with a 100% foreign share are now allowed, and, with the introduction of EPTE status, qualified companies are exempted from paying import duties and the value-added tax on imported parts and components. As exemplified in these cases, Indonesia has now adopted a strong export oriented policy. Up to now, the new Indonesian policy has worked effectively. It has succeeded in inviting many foreign investments into the electrical and electronic industry, and the industry is also turning to a new era of development.

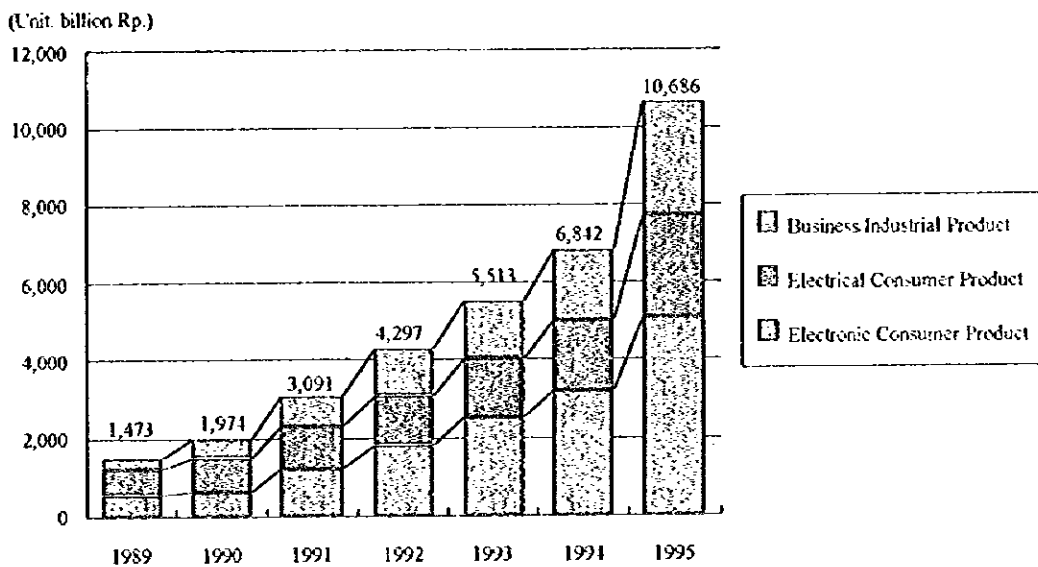
However, the size of the electrical and electronic industry in Indonesia is still small. According to the information from MOIT, the total number of the companies in the industry is only 297, including both assemblers and parts manufacturers. The breakdown by company is that there are 234 assemblers and 63 parts manufacturers. The relatively small number of parts manufacturers indicates that the electrical and electronics industry in Indonesia heavily depends on imported parts and components.

Although there are a few state owned companies such as P.T. Len Industri in the industry, almost all companies are private companies. Export of electrical and electronic products is mainly done by joint venture companies with foreign multinational companies.

In 1995, the electrical and electronic industry had approximately 100 thousand employees, with production valued at Rp. 10.7 trillion, and exporting US\$ 2,060 billion worth of goods.

Fig. 2-1 shows the flow of the domestic production of electrical and electronics products in Indonesia between 1989 and 1995. The domestic production of both consumer products and industrial products, which jointly amounted to Rp. 1,473 billion in 1989, expanded 7.3 fold to Rp. 10,686 billion in 1995. The average annual increase rate in these 6 years recorded a substantial 39.1%.

Figure 2-1 Flow of the Production of Electrical and Electronic Products in Indonesia



Source: MOIT

The total export value of electrical and electronic products, which was 136 million US dollars in 1989, rose to 2,056 million US dollars in 1995. This means the annual increase rate is very large at 57.3%. By product category, video equipment and audio equipment in consumer products, and all items in industrial products have seen substantially increased exports. By item, VCRs have emerged as the largest export product, accounting for roughly one fourth of the total export value of electrical and electronic products. The fact behind this is that P.T. Kotobuki Electronics Indonesia, which produces VCRs for RCA, GE and some other foreign companies, exports a large amount of VCRs. Other than VCRs, audio products, such as radios, TVs, CD players, microphones, speakers and amplifiers, information processing equipment, telephones, OA equipment, such as facsimile machines, and cassette and video tapes have become major export items of electrical and electronic products.

Electrical and electronic products, which are produced in Indonesia, were exported to about 100 companies throughout the world in 1994. The major importing countries of Indonesian products are the U.S.A, Singapore, Germany, Japan, and the U.K., in order of value. Among them, the U.S.A. and Singapore are by the largest, jointly accounting for 60% of total export of electrical and electronic products from Indonesia.

In these 6 years, the import of electrical and electronics products has rapidly expanded at around 13.5% annual increase rate, and reached US\$ 1,671 million in 1995. The degree of increase of electrical and electronic product import is, however, lower, compared with that of export. It is worth noting that exports have been greater than imports in value since 1993.

By product category, in three categories, i.e., electrical consumer products, electronic consumer products, and industrial products, imports about doubled during the 6 years. In terms of value, industrial products accounted for 87.9% of total import value in 1995, and overwhelmed consumer products. Among industrial products, telecommunication equipment, data processing equipment, and industrial equipment are the top three import items, each amounting to more than 100 million US dollars.

(2) The Electrical and Electronics Parts Industry

As previously mentioned, most of the local production of the electrical and electronics industry has not yet gone beyond labor intensive, knock-down type work. Also the supply of parts and materials in Indonesia is still very limited, and most requirements are dependent on foreign imports. In the beginning of the 1990s, however, the Indonesian government adopted various supporting policies on foreign investments and tax exemptions to develop the electrical and

electronic parts industry, realizing the importance of the role of the supporting industries.

Despite such governmental support, the localization ratio of consumer electrical and electronic products is still low at 30 to 35%, including supplementary materials. In addition, most major parts, precise parts, and functional parts are imported from foreign countries such as Singapore, Malaysia, and Japan.

Major parts, components and materials, which are procured in the country, are classified into four categories by source as follows:

- a. Assemblers' in-house production : tuners, magnetic heads, compressors, etc.
- b. Japanese affiliated companies : pipes, plastic molding parts, plastic resins, speakers, wire, switches, VCR heads, motors, transformers, etc.
- c. Foreign affiliated companies : press parts, plastic molding parts, plastic resins, tape mascots, wire, speakers, CRTs, transformers, components, etc.
- d. Domestic companies : press parts, plastic molding parts, pump cast housings, PCBs, DG coils, antennas, batteries, corrugated cardboard, urethane material, cooling oil, printed material, ink, solder, tapes, etc.

By the number of items, procurement from domestic companies is large, but, in terms of value, it is less than 50% of the total local procurement. In addition, domestic companies produce few critical parts and components.

Table 2-6 summarizes the flow of the production of major electrical and electronic components and products. There are no detailed statistics in Indonesia specifically on electrical and electronic parts. This is partly because of the fact that electrical and electronic parts manufacturers produce not only electrical and electronic parts but also produce automotive parts, machinery parts, etc.

Table 2-6 Production Flow of Electronic Products and Components

| Commodity | unit | 1991/2 | 1992/3 | 1993/4 | Rate (%) |
|-----------------------------|------------|---------|---------|---------|----------|
| Central Telephone & PABX | line unit | 365,373 | 481,372 | 600,248 | 38.9 |
| IIF-SSB | unit | 5,165 | 6,197 | 7,128 | 11.9 |
| Radio Broadcast | unit | 25 | 30 | 32 | 44.2 |
| PCM/multiplex | unit | 38 | 38 | 45 | 2.9 |
| Small Earth Station | unit | 33,725 | 42,393 | 46,642 | 15.8 |
| VHF/UHF single channel | unit | 13 | 13 | 43 | 55.1 |
| TV Relay Stations | unit | 5,615 | 8,646 | 9,046 | 18.9 |
| Integrated circuits | mill. unit | 176 | 211 | 221 | 14.8 |
| Telephone sets | 1,000 unit | 728 | 1,081 | 1,208 | 127.8 |
| Automobile radios | unit | 1,032 | 1,184 | 1,200 | 9.9 |
| Micro computers | unit | 37,000 | 44,933 | 53,017 | 52.0 |
| Radios/Cassette Radios | 1,000 unit | 3,788 | 5,293 | 5,660 | 25.3 |
| Television sets | 1,000 unit | 1,581 | 1,856 | 1,476 | 19.7 |
| Automobile Radios/cassettes | 1,000 unit | 1,467 | 1,650 | 1,700 | 39.1 |
| Amplifiers | 1,000 unit | 187 | 288 | 120 | 7.5 |
| Tuners | 1,000 unit | 1,098 | 2,012 | 4,416 | 113.8 |
| Loudspeakers | 1,000 unit | 26,086 | 34,889 | 30,000 | 21.7 |
| Resistors | 1,000 unit | 11,903 | 13,430 | 15,182 | 50.8 |

Source: Ministry of Industry

Some of the representative Japanese affiliated parts manufacturers are a compressor factory for air-conditioners and refrigerators, a foundry for compressors and water pumps, and factories to produce wire-harnesses for electronic appliances, condensers, transformers, counters, PCBs, and so on.

Some local companies manufacture products such as VCR heads, electrical bulbs, OA equipment, main components of telephone line controllers, batteries, distribution transformers, after sales service parts and components, and plastic molding parts for consumer electrical appliances in technical cooperation with foreign companies. However, those who do not receive technical assistance from Japanese or other foreign companies have relatively low levels of technology.

In Indonesia, there are no companies who conduct large-scale production of electronic devices such as variable condensers, switches, and volumes. Instead, multinational electronic parts manufacturers produce those devices in Thailand and Malaysia in very large volume, and export their products to Indonesia.

The expansion of the production of electronics parts by multinational companies largely de-

depends on the growth potential of the domestic market of electrical and electronic products, the possibility of which is expected to be large.

(3) Priority Products and Essential Technologies

Based on the parts list of major electrical and electronics products, the assessment of priority products to which priority in localization should be given was carried out. The assessment was done from three points of view: (a) economic impact, (b) technological impact, and (c) comprehensive competitiveness, which is aggregate competitiveness created by the difficulty of market entry, product competitiveness, and so on. The results of the assessment for each item were summarized and comprehensive priority was graded. The results of selection are summarized in the following table.

| Classification | Priority Parts and Components |
|---------------------------------|---|
| Mechanical parts/ components | Plastic cases, Plastic injection parts, Press parts, Machine processed parts |
| Electrical parts/ components | PCB (one side, both sides, multi-layer), Induction motors, DC motors, Audio speakers, Electrical connectors, Low voltage connectors, Very low current connectors |
| Electronic parts/ components | Resistors, Condensers, Semiconductors |

Following those parts listed in the above table, flexible printed circuit boards, liquid crystals (black and white, and color), micro speakers, button switches, and sensors were given priority.

Priority parts and components selected are the kinds of products which are produced on a large scale and are intended to be exported. Multinational companies have know-how and distribution channels to produce and distribute those parts and components. Therefore, the introduction of foreign companies who have well-known international brand names should be the main focus of the development strategy of the industry. In order to lure these companies, the development of essential technologies for Indonesian domestic companies is regarded as imperative.

As for the technologies used for the manufacturing of electrical and electronics parts and components, some are indispensable for production but some are not. In addition, some can be transferred in a relatively short period, while some can only be done in a medium to long time

period. Based on that understanding, essential technologies necessary for the production of the priority parts and components are listed. Among them, priority essential technologies, which are given special priority in the development of the industry, are determined. The results of the determination are summarized in the following table, in which a matrix of six categories of essential technologies is set up by the possible time of achievement and the degree of the priority.

| Degree of Priority | Time of Achievement | |
|--------------------|--|--|
| | Short Term | Medium to Long Term |
| High (A) | Single press, Metal sheet press, Injection molding (ordinary), Insert molding, Machining, Die (single press), Die (metal sheet press), Mold (ordinary plastic injection) | Heat treatment |
| Moderate (B) | Painting, Printing, Soldering, Ultrasonic wave bonding | Progressive press, Transfer press, Turret punch, Injection molding (engineering plastic), Plating, Grinding, Surface quenching, Welding, Die (progressive press), Mold (engineering plastic), Surface mounting |
| Low (C) | (nothing) | Compression molding, Metal hoop molding, Two-color injection molding, Die (transfer press), Die (die-casting), Mold (rubber), Mold (glass) |

In short, press technology (single press, metal sheet press), plastic injection molding technology (ordinary injection molding, insert molding), machining technology, die and mold technology (single press, metal sheet press, injection mold), and heat treatment technology are selected as very high priority technologies.

3. THE MACHINE PARTS INDUSTRY IN INDONESIA

(1) Industrial Machinery Industry

The development of the machinery industry started in the latter half of the 1970s, when the Indonesian government began to pursue a policy of replacing imported basic materials with domestic substitutes. Together with a policy of promoting the local production of automotive parts, the replacement of imported consumer goods made of metal with domestic products was promoted.

Indonesia's industrialization has been marked by two special features: first, it has been furthered by foreign companies moving their manufacturing bases to Indonesia in what is known as the "Second Wave of Foreign Investment," which began in the latter half of the 1980s; and second, there have been structural changes in the country's industrial sector as a result of private domestic companies increasing their shares of the various industries.

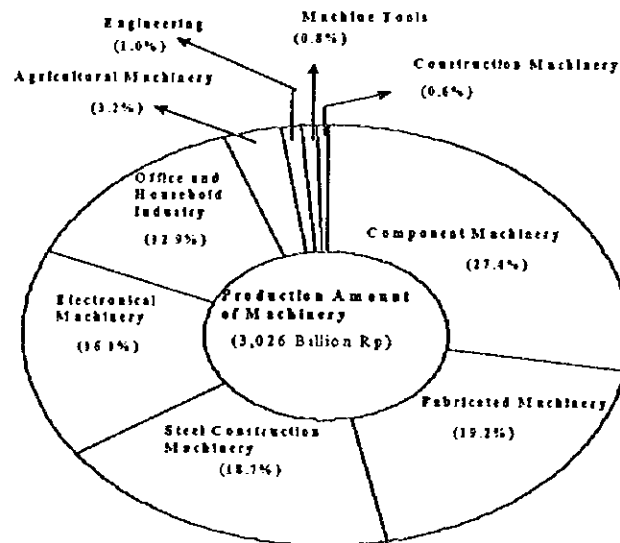
The private domestic companies' share of the metal and general machine industries was 42-44% until 1990, when it shot up to 66-67%, far exceeding the shares of state-run companies and foreign companies. This sudden growth was due in part to the government's policy of promoting local production, but it was also due to the many private domestic companies that, following in the footsteps of foreign companies, entered those industries, introduced technology and, through imitation, increased their market shares. However, compared to the explosive growth in electronic machinery and transport machinery that began in the mid 1970s, the growth in general machines has not been that great.

Among specific types of products among general machinery, pumps, except for special steel products and other special products, are produced locally and some are also exported. In the area of machine tools, some small, general-purpose machines are locally produced, but in this area Indonesia relies almost completely on imports. In line with the growth of the textile industry, the production of some kinds of textile machines has been started, but the majority of these machines are imported. With regard to diesel engines, at present some of the cast and forged materials in the motors are imported, but small and medium-sized diesel engines are almost completely manufactured locally.

In 1995, the total value of the goods shipped was approximately Rp.302.6 billion (US\$1,331 million). By product group, "machinery components" occupy the largest share of 27.4%. The second largest share was occupied by "fabricated machinery," with 19.2%. Third was the "steel construction material industry," with 18.7%. Next was "electrical machinery," with

16.1%. These four product groups accounted for more than 80% of the industry's total shipment value.

Fig. 2-2 Composition of Machinery and Engineering Industry (1995)



Source: Laporan Kegiatan Tahun 1994-1995, MOIT

Looking at investment trends in the machine industry over the past five years, it is observed that the average number of companies (foreign and domestic combined) that made (authorized) investments in the industry was approximately 80 per year. As of the end of 1995, there were 1,047 registered companies in the industry. The ratio of domestic and foreign investments has varied from year to year, but generally the amounts from the two groups have been about equal.

Table 2-7 Investment and Newly Established Companies

| No | Item | 1991 | 1992 | 1993 | 1994 | 1995 | Growth rate |
|----|-------------------------------------|---------|---------|---------|---------|-----------|-------------|
| 1 | New Companies | 74 | 84 | 85 | 82 | 76 | 3.7% |
| 2 | Non Foreign / Domestic (million Rp) | 102,652 | 72,100 | 111,562 | 512,192 | 616,998 | 128.0% |
| 3 | Domestic (million Rp) | 85,836 | 68,407 | 212,573 | 288,650 | 107,103 | 75.4% |
| 4 | Foreign (thousand US\$) | 88,888 | 104,824 | 193,255 | 192,515 | 192,360 | 34.0% |
| | Total (million Rp) | 319,375 | 357,702 | 729,960 | 993,357 | 1,161,337 | 50.7% |

Note: Prepared by the Study Team.

Source: Laporan Kegiatan Tahun 1994-1995, MOIT

The total import value of the machinery and machinery components in 1995 was US\$ 7,984 million, which is 6 times as large as the total domestic shipment value of the industry. In the machinery industry, the sub-industry whose imports have the largest value is "fabricated machinery"; its imports account for 52.7% of the industry's total import value. However, this sub-industry's imports are increasing at an average annual rate of only 2.2% - less than the 4.0% average in the machinery industry as a whole. The sub-industry with the second largest import value is the "component industry"; its imports account for 21.6% of the total. Moreover, its imports are growing at a high average annual rate of 12.5%. Third is "electronic machinery," with an 11.7% share. However, its imports are on a declining trend. These three sub-industries account for 86%, or almost all, of the value of machinery industry imports.

The total export value of the entire machinery industry was US\$ 608 million, which was less than 10% of the value of its imports; the machinery industry could thus be described as an industry that is highly reliant on imports. However, its exports have been rapidly increasing, by an average rate of approximately 30% per year. The exports of every sub-industry except "machine tools" have been increasing. The rate of increase has been particularly high for "construction machines" and "agricultural machinery." Moreover, the sub-industries with the largest export values are the "office and household industry," "fabricated machinery" and the "component industry."

(2) Machinery Parts Industry

In the Indonesian statistics, machine parts are not classified independently, but shown as the "component industry" within the machine industry. Various kinds of machine parts are manufactured in Indonesia. Based on shipment value, the main ones are industrial machine parts, weaving machine components, ball bearings, axles, air filters, machine components, lathes, etc.

Table 2-8 Production of Components and Parts of Special Industrial Machines and Machinery & Equipment in 1993

| Description | Unit | Quantity | Value (Million Rp.) |
|--------------------------------------|---------|----------|---------------------|
| Spare Parts | * | - | 4,606 |
| Factory Equipment | * | - | 2,414 |
| Weaving Equipment | Ton | 1,593 | 2,116 |
| Weaving Components | 000 Pcs | 106 | 1,887 |
| Cast Steel | Ton | 712 | 1,637 |
| Lathe Goods | Ton | 51 | 772 |
| Spare Parts for Pumps | Ton | 300 | 580 |
| Vacuum Filters | Unit | 2 | 560 |
| Food Pans | Unit | 5 | 550 |
| Flyers | 000 Bh | 2,083 | 520 |
| Screw Presses | Unit | 25 | 506 |
| Bobbins | 000 Pcs | 883 | 478 |
| Other | | | |
| Total of Special Industrial Machines | | | 22,127 |
| Description | Unit | Quantity | Value (Million Rp.) |
| Ball Bearings | 000 Pcs | 5,751 | 14,910 |
| Axles | Ton | 13,731 | 13,797 |
| Air Filters | * | - | 8,926 |
| Machine Components | Ton | 2,950 | 7,695 |
| Spare Parts | * | - | 7,526 |
| Lathes | * | - | 1,240 |
| Gears | Pcs | 58,085 | 1,115 |
| Brake Blocks | 000 Pcs | 137 | 1,032 |
| Factory Tools | * | - | 935 |
| Concrete Goods | Ton | 223 | 412 |
| Sewing Machine Components | Set | 12,500 | 411 |
| Pulley Fans | 000 Pcs | 92 | 315 |
| Pumps | Pcs | 983 | 98 |
| Rotary Pumps | Pcs | 20 | 20 |
| Other | | | |
| Total of Machinery and Equipment | | | 61,153 |

Note: Listed items are selected for their large production value.

Source: "Annual Survey of Large and Medium Manufacturing Establishments," 1993

By comparing the values of import and export with that of domestic production, over the past two years, the import reliance rate of the "component industry" has been 86-87%.

Table 2-9 Import Dependency Ratio of Component and Parts Machinery and Equipment

(unit: million US\$)

| | 1994 | 1995 |
|-------------------------|---------|---------|
| Production Value | 335.9 | 364.9 |
| Imports | 1,496.6 | 1,720.5 |
| Exports | 93.6 | 106.3 |
| Import Dependency Ratio | 86.1% | 86.9% |

Table 2-10 shows the changes in value of imports and exports of the machine parts in various SITC, three-digit classifications during 1991-1994. As can be seen in the table, imports of diesel engine parts and air pump parts had the greatest value, while exports of machine tool parts and parts for metal processing machines were of minimal value.

Table 2-10 Export and Import Trends of Spare Parts of Selected Machinery and Equipment

(unit: million US\$)

| SITC | Item | | 1991 | 1992 | 1993 | 1994 |
|------|-------------------------------|--------|-------|-------|-------|-------|
| 713 | Engine Parts | Export | 8.8 | 9.0 | 11.2 | 13.6 |
| | | Import | 409.1 | 367.0 | 439.1 | 717.8 |
| 735 | Machine Tool Parts | Export | 0.0 | 1.3 | 0.5 | 0.4 |
| | | Import | 28.1 | 16.7 | 23.2 | 25.1 |
| 737 | Metal Working Machinery Parts | Export | 0.3 | 0.7 | 1.2 | 1.6 |
| | | Import | 140.1 | 255.3 | 123.3 | 121.1 |
| 742 | Liquid Pump Parts | Export | 3.2 | 6.6 | 4.5 | 2.0 |
| | | Import | 190.8 | 264.1 | 216.1 | 210.4 |
| 743 | Air Pump Parts | Export | 0.8 | 14.7 | 40.9 | 54.6 |
| | | Import | 341.1 | 424.2 | 378.3 | 376.8 |

Source: Export and Import Statistics.

(3) Priority Products and Essential Technologies

In the general machinery industry, not only the kinds of parts and components used but also the types of finished products manufactured by assemblers are quite varied. Thus, in this section, first, three products, a) diesel engines for general purposes, b) centrifugal pumps and 3) universal machine tools, which are the typical machinery products in Indonesia, are selected. Then, their major parts and components are listed, and their current levels of local procurement are examined.

By type of finished products, in brief, major casting parts and components such as cylinder blocks and cylinder heads are mostly dependent on imports, while metal press parts are mostly procured locally, in diesel engines for general purposes. In pumps, many of the major casting parts are produced in-house by pump manufacturers, and the production of a part of small casting parts such as flanges or pulleys are locally sub-contracted. There are only a few limited items which are imported among parts and components of pumps. As for the machine tool parts, there are almost no machine tool manufacturers in Indonesia. Thus, a limited number of machine tool parts and components are locally produced mainly for maintenance purposes.

Then, taking machine tools and reciprocating compressors, both of which are the representative products of the machinery industry, as an example, their major parts are classified by their production processes.

From the above, it was observed that 58% of machine tool parts are composed of various kinds of casting products, 13% of forging products and another 13% of welded structural metal parts. It also shows that gray iron casting products occupy the major portion of casting parts, and that almost all kinds of casting products such as ductile iron casting parts, alloy casting parts, aluminum and other alloy die casting parts and precision casting parts are used.

Not only in the parts and components of machine tools and compressors but also in those of most general machinery products, casting products occupy the major portion. Because many of these casting parts are large in size and heavy in weight, it is not advantageous for local assemblers to procure these by imports. Thus, in many of the countries, the development of the casting industry is closely linked with the development of the machinery industry. In Indonesia, it could be said that the delay of the development of the machinery industry hampered the progress of the casting industry on the one side, and that the lack of an established casting industry is currently one of the major constraints on the development of the machinery industry for the other.

From the results of the above analysis, the following elemental technologies are identified as the major essential technologies for future development in Indonesia:

- (i) Casting technologies
 - Gray iron castings
 - Ductile castings
 - Alloy castings

- (ii) Forging technologies
 - Hot stamp forging
 - Cold stamp forging
- (iii) Metal press technologies
- (iv) Machining technologies
 - Metal cutting
 - Metal grinding
- (v) Plastic molding technologies
- (vi) Sintering technologies

The machinery parts industry in Indonesia is still at the beginning stage of development, and many of their products are confined to maintenance parts. As has been stated, the major reason for the above is that the machinery industry is still at its infant stages. Under the circumstances, the direction of the development of the Indonesian machinery industry has to be examined in advance of the establishment of the development strategy of the machinery parts industry in Indonesia.

Based on the results of the comparison of machinery industry structures between Indonesia and Japan, the priority production items of the machinery industry to be developed in Indonesia were selected (the items which are included in the electric and electronics industry group in this survey are excluded.):

Group I : Product group which could be manufactured at the current technical level in Indonesia.

- Centrifugal pumps
- Valves and cocks, etc.
- Reciprocating air compressors
- Screw pumps
-

Group II: Product group which could easily be introduced at the current technical level in Indonesia.

- Pneumatic devices
- Universal metal working machines
- Jigs and fixtures (Tools and dies)
- Universal machine tools
- Diesel engines
- Gasoline engines

Group III: Product group which could possibly be produced by improving the current technologies in Indonesia.

- Bearings (Rolling)
- Precision dies and molds
- High grade tools (such as diamond, ceramic or CBN tools)
- Oil hydraulic pressure devices
- Servo-mechanisms
- CNC-machine tools(3 dimension)

Group IV: Product group which should be introduced in the near future in Indonesia.

- High grade servo-mechanisms
- Industrial robots (Multi-link systems)
- Precision metal working machines

Group V: Product group which should be introduced in Indonesia with a long-term perspective

- High grade CNC-machine tools (5 dimension)
- Super-precision machine tools

For the development of the general machinery industry in Indonesia, the following approaches would be needed. As a short-term development target, the localization of parts and components of such products as general purpose engines, compressors or construction machinery, which are currently manufactured in Indonesia, has to be enhanced. As a middle-term target, the development of such products as molds & dies or jigs & fixtures is essentially needed because the basic technologies and skills of these products are also required by most of the other manufacturing sector industries. Those products such as agricultural machinery, food processing machinery, universal machine tools or other general metal processing machinery could also be positioned as middle-term development target products because of their expected large domestic demand. Further, in the long run, the development of such mechatronics products as CNC-machine tools or industrial robots, which contribute to the industrial productivity improvement, would be highly required.

In line with the progress of the general machinery industry in Indonesia, the machinery parts industry should be developed and should support the overall development of the machinery industry. The results of the identification of the priority parts needed for the development of

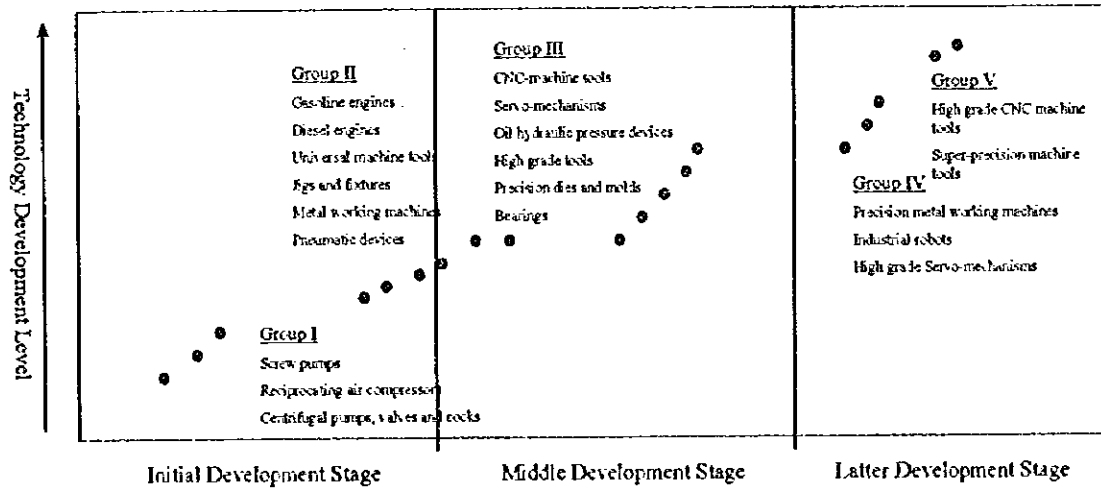
the general machinery industry and the essential technologies for the production of priority products are summarized in Table 2-11.

Table 2-11 Development Target Products by Stages of Development and by Process Technologies

| Essential Technologies | Short-term Development targets | Middle-term Development targets | Long-term Development targets |
|---|--|---|---|
| Iron Casting | Pump: casing, inlet port, priming cup Engine : Flywheel, cylinder block Machine tool : bed, column, pulley, fast head stock body | Engine : exhaust manifold, intake manifold, cylinder head, piston ring Machine tool : saddle, table, round table | |
| Ductile casting | | Engine : crankshaft, camshaft Machine tool : fast head stock body, fast head housing | |
| Alloy casting | Engine : Radiator cap | Pump : impeller Engine : piston | |
| Forging | Machine tool : gear | Engine : drive sprocket, bulb, rocker arm Machine tool : main shaft | |
| Sintering | | Engine : timing gear Machine tool : oilless bearing | Machine tool : timing belt, timing gear, belt pulley, spring clutch |
| Press work | Engine : air filter, fuel filter, oil pan, fan shroud | Pump : ball bearing liner Engine : servo-mechanism parts | CNC— machine tool : magazine case |
| (Other related) ■ Machining ■ Mold making ■ Heating ■ Surface treatment | | | |

Source : Study Team

Figure 2-3 Development Stages of Essential Technologies in Association with Those of Development Target Product Groups



| | | | |
|----------------------|--|---|---|
| Iron casting | | → | |
| Ductile casting | | → | |
| Al'num alloy casting | | → | |
| Forging | | | → |
| • Large-size | | → | |
| • Small-size | | | |
| Sintering | | | → |
| Metal press work | | | → |
| • Automatic | | → | |
| • Heavy press | | | |
| • Light press | | → | |
| Plastic molding | | | → |
| • Engineering | | → | |
| • General | | | |
| (Others) | | | |
| Machining | | | → |
| Mold making | | | → |
| Heat treatment | | → | |
| Surface treatment | | | |