JAPAN INTERNATIONAL COOPERATION AGENCY

THE MINISTRY OF INDUSTRY AND TRADE
THE REPUBLIC OF INDONESIA

THE FOLLOW-UP STUDY
ON
THE DEVELOPMENT OF SUPPORTING INDUSTRIES
IN
THE REPUBLIC OF INDONESIA

SUMMARY REPORT

June 1999

THE JAPAN RESEARCH INSTITUTE, LIMITED
YACHIYO ENGINEERING CO., LTD.

PREFACE

The Government of Japan decided to conduct a follow-up study to the Study on the Development of Supporting Industries in the Republic of Indonesia, which was originally conducted from January 1996 to March 1997 in response to a request from the Government of the Republic of Indonesaia, and entrusted the study to Japan International Cooperation Agency (JICA).

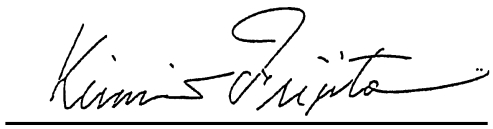
JICA sent a study team, led by Mr. Takashi Nobehara of the Japan Research Institute, Limited and constituted by members of the Japan Research Institute, Limited and Yachiyo Engineering Co., Ltd., to the Republic of Indonesia two times from December 1998 to March 1999.

The team held discussions with the officials concerned 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.

June 1999



Kimio Fujita
President
Japan International Cooperation Agency

June, 1999

Mr. Kimio Fujita
President
Japan International Cooperation Agency

Letter of Transmittal

We are pleased to submit the final report on the Follow-up Study on the Development of Supporting Industries in the Republic of Indonesia.

The Study was implemented as a follow-up to the original Study on the Development of Supporting Industries in the Republic of Indonesia, conducted between January, 1996 and March, 1997. Almost immediately after the completion of the first Study, the Indonesian economy was faced with a serious economic crisis, due to the effects of the currency crisis that beset many Asian countries. The impact on the Indonesian industrial machinery parts and components, automotive parts and components and the electrical and electronic parts and components industries, all of which had been the direct focus of attention of the original Study, was particularly severe, and there were many businesses that were either forced to cease operations temporarily, or to reduce operations to 20% or lower than normal. Of 334 companies that responded to a questionnaire survey, the average operating level following the economic crisis was 46% of capacity. In addition to very severe economic conditions at home, the Indonesian parts and components industries also face another tough test, in the form of fierce international competition due to the lowering of the common effective preferential tariff rates in the ASEAN Free Trade Area (AFTA).

In this Study, given the dramatic changes in the domestic and overseas environments surrounding the Indonesian supporting industries, we restructured the development strategies for each industry, and formulated a master-plan which contains a synthesis of the individual strategies proposed for each industry. Additionally, the Study also sets out five action programs from the perspective of reinforcing public supports in the three areas of (a) management skill, (b) marketing and (c) financing, all of which are pressing issues at this stage.

The details of the Study Team's proposals have been fully discussed at the seminar to which representatives of the Indonesian government and private sector

industry were invited, and expectation and enthusiasm were expressed with respect to the implementation of these proposals. The entire membership of the Study Team share the hope that, with the effort of the Indonesian government and the cooperation of related Japanese organizations, the programs will be able to be implemented as quickly as possible, and contribute to the Indonesian industrial development.

In closing, allow me to express my gratitude at the most valuable guidance and support so generously provided by the Japan International Cooperation Agency, the Ministry for Foreign Affairs, Ministry for International Trade and Industry, and other related organizations. Our warmest thanks also go to the Ministry of Industry and Trade and other related governmental organizations of the Republic of Indonesia, for their cooperation and support.

Sincerely yours,

Takashi Nobehara
Team Leader
JICA Follow-up Study Team
on the Development of the Supporting Industries
in the Republic of Indonesia

Table of Contents

INTRODUCTION

The Japan International Cooperation Agency (JICA) undertook a Study on the Development of Supporting Industries in Indonesia from January, 1996 to March, 1997. The purpose of the study was to establish a master plan for the development of the supporting industries, including proposals for measures to stimulate the industries and to resolve technical issues, in order to reinforce the industrial structure in Indonesia by promoting domestic production in the automotive parts, machine parts and electrical and electronic parts industries. The results of previous study were summarized in the Final Report of the study, which was reprinted and widely distributed among interested parties in Indonesia, to considerable acclaim. Further, some of the fourteen action programs proposed by the Study Team have already proceeded to the stage of implementation.

However, as a result of the currency crisis that beset Asia from July, 1997, onwards, and the ensuing economic turmoil, there have been dramatic changes in the circumstances surrounding the supporting industries in Indonesia, compared to the situation at the time of the previous study. Also, the Indonesia government strongly requested that the Japanese government provide further support for the development of small and medium scale industries. In line with this request from the Indonesian side and the understanding of their urgent needs, in September of 1998, JICA dispatched a Project Identification Study Team to Indonesia, and concluded an agreement with regard to the implementation of this follow-up study.

From the above background, the objective of the study was to re-examine the original master plan proposed by the previous study for the development of the supporting industries, which had been drawn up at a time when there was a climate of steady economic growth, and to revise it in accordance with the current economic situation and the circumstances surrounding the supporting industries today. Also, where necessary, the master plan was reconstructed with the addition of supplementary measures for revitalization, and in this way, comprehensive proposals was made for the encouragement of the supporting industries and small and medium sized enterprises.

For the implementation of the study, the JICA Study Team, mainly consisting of researchers and consultants of the Japan Research Institute, Limited, and Yachiyo Engineering Co., Ltd., was formed in December 1998, and the study was started. The results of the study were summarized in the Final Report, Main Report. This report further briefly summarizes the contents of the Main Report.

Fig.-1. Overall Framework of the Study

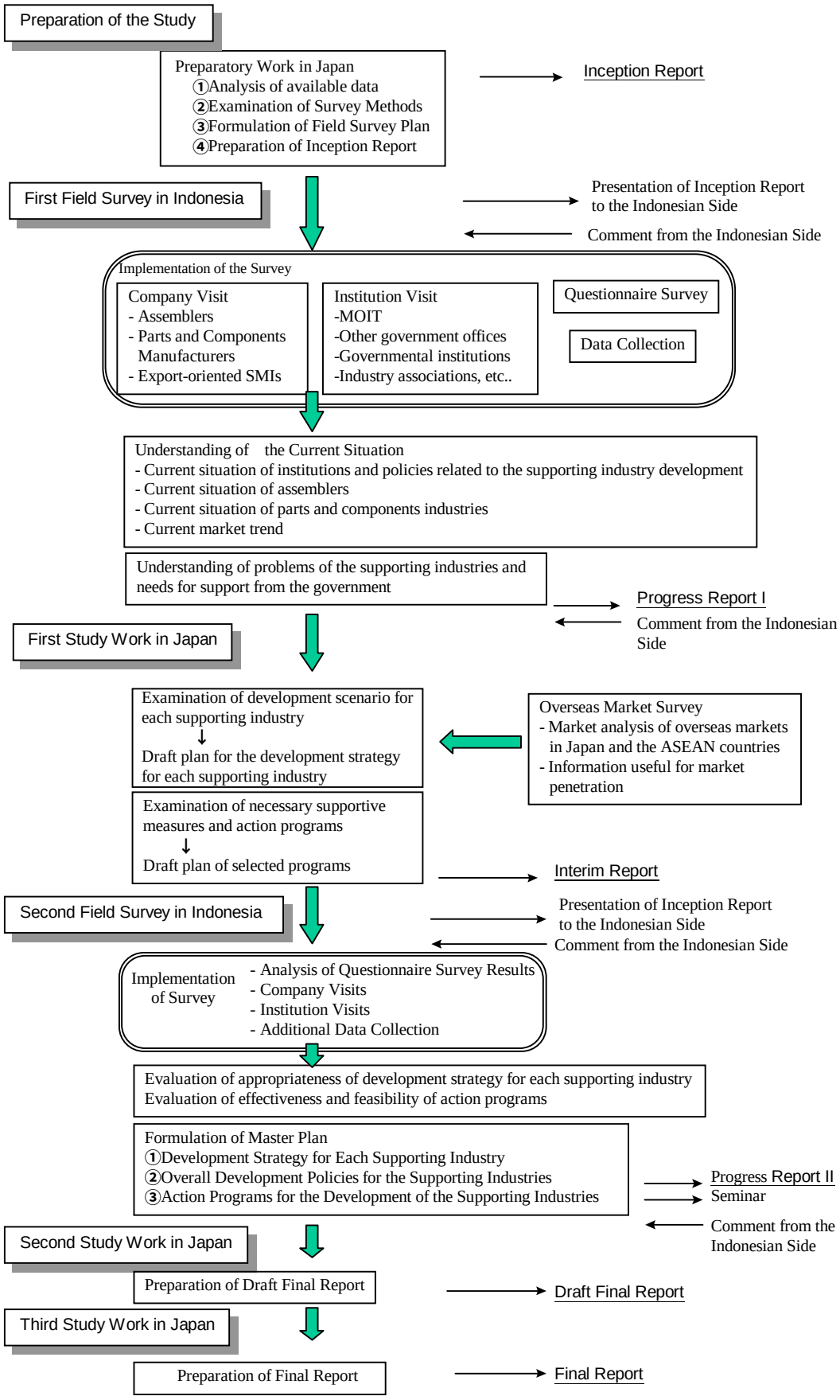


Fig. 2 Work Progress of the Study

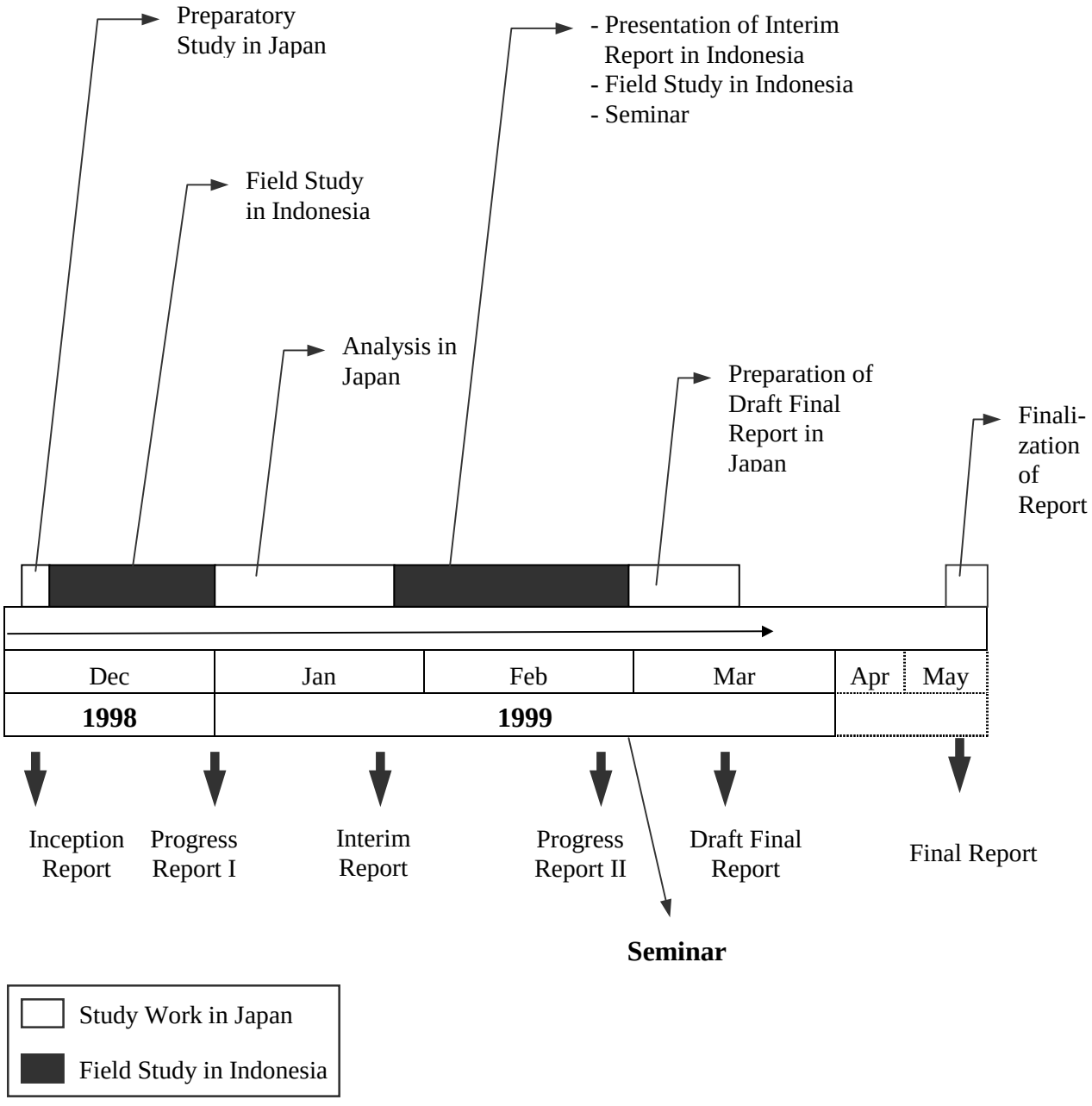


Table -1　Study Team Member List

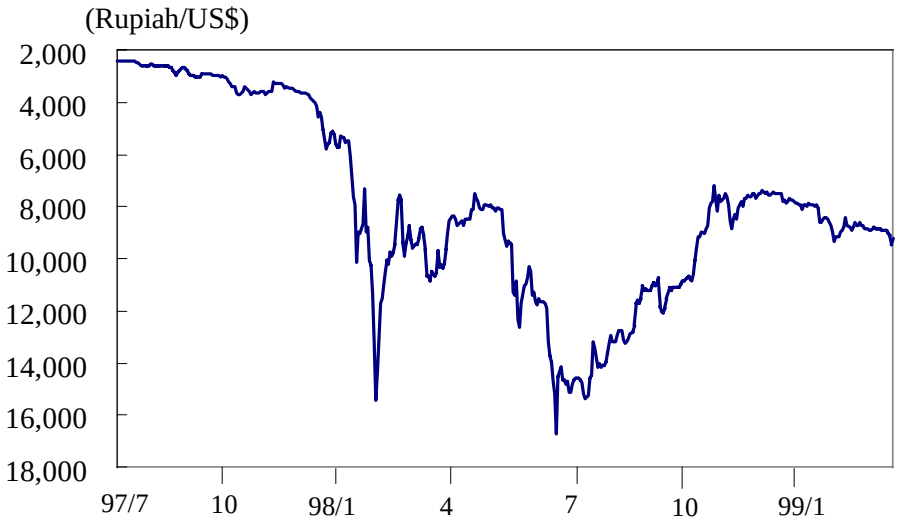
Task	Name	Company
Team Leader	Takashi NOBEHARA	The Japan Research Institute, Limited
Industrial Development Policies	Kazuo MISHIMA	The Japan Research Institute, Limited
Financial Policies	Toshio TACHIBANA	The Japan Research Institute, Limited
Industry Analysis （Automotive Parts）	Hiroshi IMAI	The Japan Research Institute, Limited
Production Technology （Automotive Parts）	Masahiro HAMANO	The Materials Process Technology Center of Japan
Industry Analysis （Electric and Electronic Parts）	Tatsuro BANDO	The Japan Research Institute, Limited
Production Technology （Electric and Electronic Parts）	Masahiro Chiji	I. K. Tool, International, Co., Ltd.
Industry Analysis （Machinery Parts）	Toshihide HAYASHI	Yachiyo Engineering Co., Ltd.
Production Technology （Machinery Parts）	Tetsuo NIHEI	Yachiyo Engineering Co., Ltd.
Industry Analysis （Export Products）	Yoichi MATSUI	Pentrade Corporation
Sales promotion & Export promotion Policies	Tamaichi MATSUMOTO	The Japan External Trade Organization (JETRO)
Third country Market Analysis	Reiko IIZUKA	The Materials Process Technology Center of Japan

I. ECONOMIC ENVIRONMENT AFTER CRISIS

(1) Impact of Economic Crisis on the Manufacturing Sector in Indonesia

In May, 1997, the currency crisis that began in Thailand spilled over into neighboring countries, and triggered serious currency declines throughout Asia. Following Thailand and Korea, Indonesia too faced drastic depreciation of the rupiah and economic turmoil.

Fig. 3 Movement of the Rupiah against the Dollar



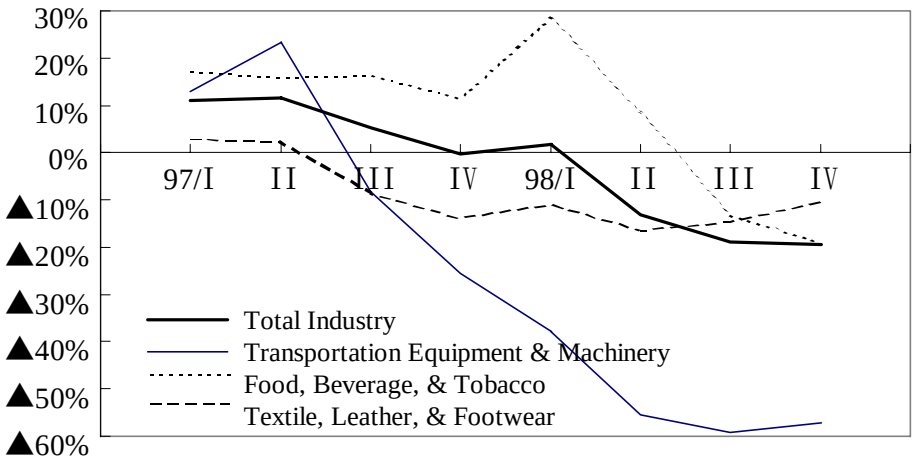
Source: Data Stream

Due to the economic crisis, the Indonesian manufacturing industry (1) underwent a drastic shrinking of the domestic market, (2) saw import prices for raw materials shoot up, (3) faced increasing difficulty in procuring materials, and (4) suffered an increase in the burden of repayment of liabilities.

The growth rate of the added value worth of the manufacturing industry for the same period in the previous year is as illustrated in Figure-4. From the third quarter of 1997, the shrinking of the domestic market caused the growth rate to begin to decline. The political instability of the second quarter of 1998 caused the growth rate to drop very sharply. In particular, the

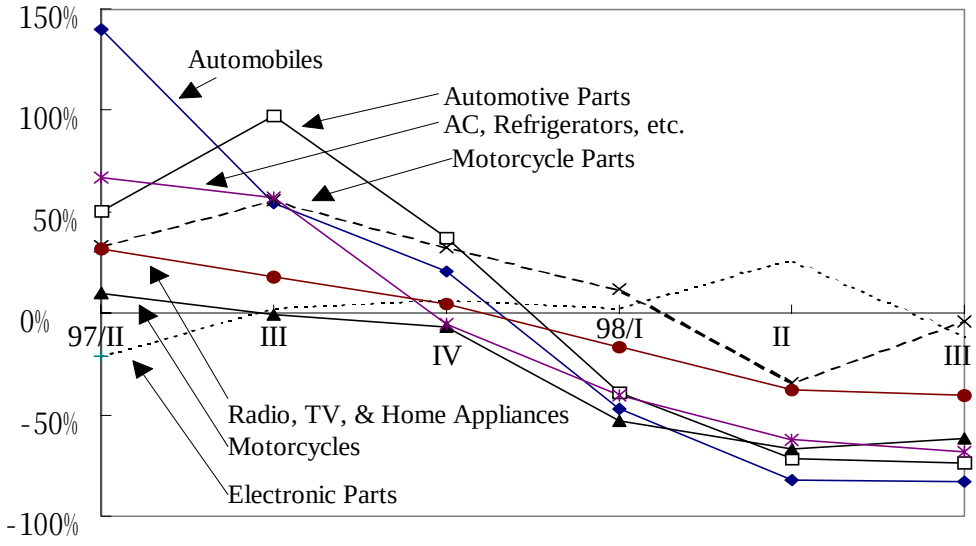
figures for transportation equipment and machinery dropped steeply, by more than 60%.

Fig. 4 Manufacturing industry added value worth growth rate (Year on Year Basis)



Source: BPS

Fig.5 Changes in Quarterly Production Indices for Large and Medium Sized Companies (Year on Year Basis)



Source: BPS

The results of the questionnaire survey, conducted in February, 1999 by the Study Team, show that the economic crisis has been having a serious influence on the supporting industries.

Table -2 Evaluation of Impact of Current Economic Crisis

Unit : %

	Total Companies	By No. of Employees			
		19 or Less	20 – 99	100 - 299	300 or More
Very Serious Impact	41.7	40.7	42.0	47.2	37.7
Serious Impact	34.1	32.7	39.3	19.4	37.7
Slightly Serious Impact	15.1	11.5	9.8	27.8	22.6
No Change	4.8	9.7	2.7	2.8	1.9
Positive Impact	4.2	5.3	6.3	2.8	-
No. of Effective Answers	331	113	112	36	53

Source: Questionnaire Survey, JICA Study Team
Note : 17 companies did not give answers for the number of employees.

Table-3 Evaluation of Impact of Current Economic Crisis on Domestic Sales

Unit : %

	Total Companies	By No. of Employees			
		19 or Less	20 – 99	100 - 299	300 or More
Decreased	85.2.	82.5	86.6	82.4	87.5
No Change	8.6	12.3	4.5	5.9	12.5
Increased	6.2	5.3	8.9	11.8	-
No. of Effective Answers	324	114	112	34	48

Source: Questionnaire Survey, JICA Study Team
Note : 16 companies did not give answers for the number of employees.

Table -4 Percentage of Domestic Sales Decrease

Unit : %

	Total Companies	By No. of Employees			
		19 or Less	20 – 99	100 - 299	300 or More
Less than 10%	0.4	-	-	4.3	-
Less than 25%	4.7	5.4	2.1	-	8.3
Less than 50%	18.8	21.5	16.0	17.4	25.0
Less than 75%	47.3	46.2	53.2	52.2	36.1
Less than 100%	.27.3	25.8	27.7	26.1	30.6
100% or more	1.6	1.1	1.1	-	-
No. of Effective Answers	256	93	94	23	36

Source: Questionnaire Survey, JICA Study Team
Note : 10 companies did not give answers for the number of employees.

Table -5 Operating Ratios Before and After Economic Crisis

Unit : %

	Operating Ratio Before Economic Crisis	Current Operating Ratio
Less Than 10%	-	3.6
10 – 24%	-	17.5
25 – 49%	3.2	33.6
50 – 74%	10.1	28.5
75 - 99%	45.0	8.4
100% or More	41.7	8.4
No. of Effective Answers	278	274

Source: Questionnaire Survey, JICA Study Team

(2) Impact of the Economic Crisis on the Financial System

Since the financial crisis began in July 1997, massive capital outflows have put persistent pressure on the sharp depreciation of the rupiah exchange rate. Towards the end of 1997, when the rupiah had depreciated to less than half of the pre crisis level, a confidence crisis spread pervasively through the international markets as well as domestic markets. The result of this was the collapse of the Indonesian economic system including its banking system. Depositors took funds out of the banking system, particularly out of the private banks and converted them into US dollar denominated assets.

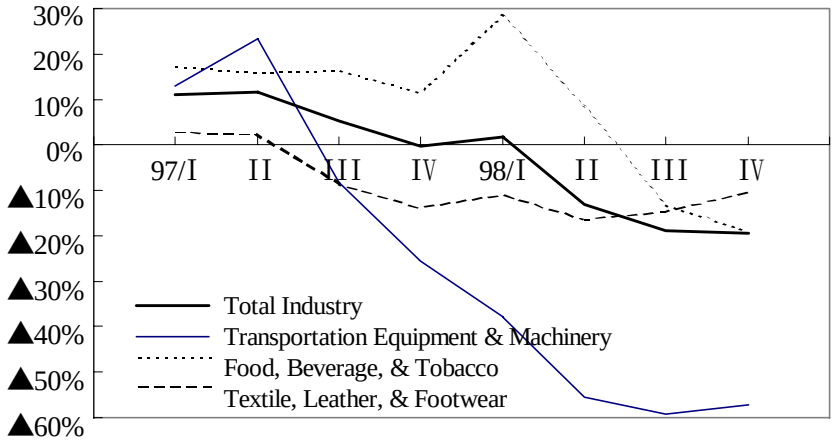
A closer review of the trend of banks' funds and deposits by currency and by group of banks shows unique features for each category of banks. Firstly, the contraction of bank funds and credits was more significant at the private banks. This can be seen clearly in the change of US dollar denominated funds. The US dollar denominated funds of the private banks declined from $14.5 billion in June 1997 to $3.8 billion in June 1998, about one quarter of the pre-crisis level. During the same period, private bank US dollar denominated credits declined from $12.5 billion to $7.4 billion. Meanwhile funds denominated in rupiah and US dollars of state owned banks and foreign banks showed some increase, which implies a shift of funds from private banks to state owned and foreign banks. The private banks were most

seriously damaged by capital outflows, although the whole banking sector was severely affected by the financial crisis. The private banks have not been functioning since the beginning of 1998.

Secondly, the banks' funds became larger than their credits for all categories of banks after the crisis. It is apparent that the Indonesian banking sector is neither able to nor willing to extend credits since the beginning of 1998. Financial intermediation, a major function of the banking system, is not working at the moment. This is certainly the result of the increasing risks of the private borrowers. However, this is also a result of the Government policies; i.e., tight monetary policies and the restructuring of the banking sector. Under the current policy direction, i.e., the banking sector restructuring program including the government guidance on improving Capital Adequacy Ratio (CAR), the banks are not in a position to take additional credit risks and channel funds to the necessary economic activities.

Thirdly, the interest rate on deposits is much higher than the interest rate on lending for most of the Indonesian banks (except foreign banks) since the crisis. A wide negative margin between deposits and lending became a persistent feature of the state owned banks and private banks. The tight monetary policies introduced a) to prevent capital outflows and further depreciation of the rupiah exchange rates and b) to curb inflationary pressures, have pushed up the domestic interest rates. A large number of banks are also suffering from meeting the statutory reserve requirements, thus paying higher interest rates in order to mobilize funds and also to prevent further drain of the deposits. The Government and banks face a dilemma; high interest rates are necessary for avoiding further drain of the funds from the banking system, while on the other hand, such high interest rates cause more insolvent borrowers, i.e., higher non-performing loans.

Fig. 6 Trends in Interest Rate of SBI 28 Days



Source: Bank Indonesia

Under the above circumstances, the corporate financing has the following problems.

1) High interest rates

According to the bank officers interviewed, the potential needs for bank loan are still stable, however interest rate is too high to borrow investment credit. It is predicted that if the interest rate fell to less than 30% (preferably under 25%), the needs for investment credit will be acted on. An economist of Bank Indonesia predicts that inflation rate will drop to 15.5% by the end of the next fiscal year, and that the final rending rate to customers will be 20 to 25% accordingly.

2) Lack of long-term funds

In Indonesia, access to long-term funds is quite limited. There are several institutional lending schemes to provide long-term funds, but usually supporting industries are not eligible for such schemes except for very small entities.

3) Weak banking system

As a result of the economic crisis, most of the Indonesian banks fell into capital deficiency

and required cutting their risk assets to maintain an acceptable CAR ratio. Therefore, they do not have enough strength to supply new loans. According to one of the bank officers interviewed, many enterprises are required to repay all of their borrowings from bankrupted banks.

From the above, the required financial policy measures are summarized as follows.

1) Working Capital Financing Scheme for Small and Medium Industries

After the economic crisis, a considerable number of supporting industries are required to pay cash in advance and they are having difficulty in purchasing raw materials and parts. According to the questionnaire survey, 73% of the supporting industries purchase their raw materials and parts in cash in advance. This requires a large amount of working capital for industries and represents a heavy burden especially for small scale enterprises that do not have large amounts of self capital nor enough assets suitable for collateral.

For these reasons, several measures have already been taken as a social safety net. Such as Working Capital for Rural Banks and Syariah Rural Bank Development (KMK-BPR, KMK-BPRs) and Credit for Micro Scale Entrepreneur through BPR (KPKM) of Bank Indonesia, and Small and Medium Scale Industry Development (IKM) of MOIT. However these schemes are mainly for micro-scale industries and the lending limit is too low even for small-scale supporting industries.

2) Enhancement of Export Financing, especially opening L/C and credit insurance of L/C

After the economic crisis of Southeast Asian countries in 1997, foreign banks become reluctant to receive Letters of Credit (L/C) issued by Indonesian Banks. As a result, Indonesian supporting industries find it difficult in import raw materials and parts. Bank Indonesia and international financial cooperation organizations such as EXIM Bank of Japan, USAID, EXFIC of Australia, and ECGD of United Kingdom have prepared L/C confirmation facilities to take care of this problem. However, as a result of the banking crisis of 1998, commercial banks became very reluctant to open L/C to avoid increasing

their risk asset. The L/C confirmation scheme above will not work, if the banking sector does not open L/C. To solve this problem, the Government of Indonesia has just announced the establishment of a credit insurance scheme for L/C open for export purpose. It will proceed by PT. ASKRINDO.

3) Medium to Long Term Investment Credit Aiming at AFTA in 2002

Indonesian supporting industries will face very tough competition from other ASEAN nations with the enforcement of AFTA in 2002. In order to survive this severe international competition, it is necessary for Indonesian supporting industries to improve significantly their products both in quality and cost. Through the field interview survey conducted by the sector study team members, not all but majority of the supporting industries use old machines and needs increased investment to improve their level. However, for the reasons mentioned above, supporting industries have difficulties in raising long-term funds at an adequate interest rate. It is most essential that financial assistance to make available for investment credit to supporting industries. However, under the present economic circumstances, it is very difficult for supporting industries to put forward enough collateral. Measures to ensure repayment other than collateral is indispensable for investment credit to supporting industries. Thus, an institutional financing scheme for investment of supporting industries combined with technical support schemes is proposed.

(3) Impact of the Crisis on Exports

Indonesian exports of industrial commodities had steadily kept growing until 1996. But growth was halted in 1997 and continued to slow down in 1998.

Besides the demand problem in the outside world, the several riots which happened in 1998 caused serious anxiety among foreign buyers about the certainty of delivery of ordered goods. The difficulties in trade financing for importing materials, which occurred as a result of the shaky conditions of Indonesian banks, are still negatively affecting the smooth production of some of the export goods. Thus the economic crisis and the following unrest of the society caused some drastic changes in the export structure in 1998.

Table -6 Comparison of Export of Non Oil and Gas Industrial Commodities (1995 - 1998)

Unit: US$ million

Commodities	Change 96/95	Change 97/96	January-October		Change 98/97
			1997	1998	
Textile	6.1%	13.9%	5,939.3	6,175.5	4.0%
Wood, Wooden Products	4.3%	7.7%	5,127.6	3,823.2	-25.4%
Electric & Electronic Products.	31.8%	0.0%	2,800.9	2,493.3	-11.0%
Metal Products, Machines, Automotive	9.5%	-8.7%	1,427.9	2,168.1	51.8%
Gold, Silver, Precious Metal	62.0%	50.8%	824.0	2,059.2	149.9%
Paper , Paper Products	-4.4%	2.9%	1,164.2	1,898.2	63.1%
Rubber Products	1.6%	-13.4%	1,636.9	1,321.1	-19.3%
Palm Oil, Palm Products	12.5%	40.5%	1,899.1	1,314.7	-30.8%
Leather Products, Footwear	5.1%	-29.3%	1,638.0	1,310.7	-20.0%
Basic Chemical Products	19.0%	28.4%	831.5	1,268.2	52.5%
Sub-total	9.5%	5.6%	23,289.4	23,831.9	2.3%
Others	11.7%	22.3%	5,311.0	5,501.3	3.6%
Total	9.5%	8.5%	28,600.4	29,333.2	2.6%

Source: Central Bureau of Statistics

The effect of the economic crisis on the export of each industry has been mixed. Those that are still fast growing are only “Gold, silver, precious metal products”, “Paper products” and “Basic chemical products”. “Electronics products” and “Palm products”, which seemed to have a strong hold due to the drop of the currency value, decreased.

"Rubber products" and "Leather products & footwear" became even weaker.

Table -7 Growth Tendency of Export of Non Oil and Gas Industrial Commodities (1993 - 1998)

Commodities	93-96	97/96	98/97
Textile	Steady	Fast	Steady
Wood, Wooden Products	Mixed	Fast	Fairly Negative
Electric & Electronic Products.	Fast	Zero	Fairly Negative
Metal , Machines, Automotive Products	Fast	Moderately Negative	Fast
Gold, Silver, Precious Metal	Mixed	Fast	Fast
Paper , Paper Products	Fast	Steady	Fast
Rubber Products	Fast	Fairly Negative	Fairly Negative
Palm Oil, Palm Products	Fast	Fast	Fairly Negative
Leather Products, Footwear	Fast	Fairly Negative	Fairly Negative
Basic Chemical Products	Fast	Fast	Fast

Source: JICA Study Team

The effects of the economic crisis on exports observed from the questionnaire survey results are as follows.

1) Effect of Economic Crisis on Exports of Supporting Industries

Among 334 effective answers, 103 companies have export records. Out of the 101 companies, 46 companies said their export decreased. 14 out of 36 companies said the decrease ratio was 50-75%. On the other hand, 29 companies said their exports increased, and out of them 9 companies attained more than a 100% increase.

The effect of the economic crisis brought about two-side consequences depending on the position of the companies whether or not 1) they need the imported materials, 2) they can secure the import finance, or 3) they can expect assistance for export promotion from their parent companies.

2) Problems Concerning Exports of Supporting Industries

Out of the total 334 companies, 231 companies have no experience in export, although 75 companies among them are hoping to start export. 152 companies pointed out the following as problems in their export promotion activities.

- Lack of ability for export promotion: 70 companies
- Finance : 53 companies
- Trade infrastructure: 34 companies
- Fluctuation of exchange rates : 33 companies
- Lack of ability to handle the export procedures: 32ompanies
- Governmental policies : 27 companies
- Tax schemes : 25 companies

The counter-measures to the major problems above would be governmental cooperation to take care of the inability of the supporting industries in export promotion. The government should provide them with overall and complete market information and more opportunities for education and training on export procedures. At the same time, the government should bring in more tax incentives for exports and plan financial assistance measures for the supporting industries, in order for them to have the financial basis for export activities. The present problems in financing the import of materials, and in financing for working capital for export should be solved as soon as possible.

3) Requests of the Supporting Industries for Assistance in Export Promotion

317 companies out of the total 334 answered the question regarding the governmental assistance requested by the supporting industries for their export promotional activities. Table - 8 shows the answers to the questionnaire.

Table -8 Requested Assistance Measures for Export Promotion Activities

	Very Important	Important	Not important
Dispatch of overseas trade missions	34.1%	36.9%	29.9%
Subsidy for the participants of overseas trade fairs	29.1%	49.4%	21.5%
Providing overseas market information	48.4%	43.4%	8.2%
Exporters registration scheme	16.7%	47.5%	35.7%
Consulting services for trading	29.5%	57.5%	13.1%
Expansion of trade training courses	29.4%	56.8%	13.9%
Export incentive/ Financial assistance	40.9%	48.4%	10.7%
Export incentive/ Tax reduction	43.0%	49.5%	7.5%

Source: Questionnaire Survey, JICA Study Team

As many of the supporting industries do not have enough strength to access the overseas markets, they are unable to acquire the market information directly. This is an area in which the government must provide assistance. Such export incentives as financial assistance and tax reductions are also important to promote exports by supporting industries. Seeing the results of the above questionnaire survey, it became obvious that the practical trade training courses and consulting services provided by the Indonesian Export Training Center (IETC) are very adequate to the requests of the supporting industries. They must be expanded in both their quantity and quality.

From the above, following short-term and mid / long-term policy measures could be proposed.

<u>Counter-measures to short term problems</u>

a. Support for having reverse trade fairs
b. Intensive study for the establishment of an export promotion master plan
c. Establishment of a trade finance system and conformity with WTO regulations
d. Higher utilization of Indonesian Export Training Center (IETC)
e. Setting- up of a coordinating section in NAFED which support the development of export commodities
f. Strengthening of the PR (public relations) activities by the government
g. Establishment of an industrial development policy which includes the adequate

consideration on big enterprises

h. Early reshuffles of tax incentive schemes for export

Counter-measures to medium and long term problems

a. Building up Indonesian brand names
b. Public support for overseas market access
c. Strengthening of NAFED
d. Setting up of quality and design appraisal bodies
e. Establishing a one-stop export service station
f. Improvement of export procedure and services
g. Encouraging the activities of foreign trade companies
h. Improvement of trade infrastructure, especially for the reduction of high sea freight
i. Improvement of incentives on indirect exports

Ⅱ. SUPPORTING INDUSTRIES IN INDONESIA

2.1. MACHINERY PARTS INDUSTRY

(1) Industry Trends

The machinery industry in Indonesia is underdeveloped, as may be inferred from the fact that gross production in the industry in 1997 amounted to no more than US$ 1,185 million. Of this gross production, parts and components production accounted for US$370 million, roughly equivalent to one-third of the total. Concerning the agricultural machinery sector, on which the Government of Indonesia places high priority, production was very small at just US$29 million, accounting for a mere 2.5% of production in the machinery industry as a whole. In contrast, according to the Ministry of Industry and Trade, imports of machinery in 1997 amounted to US$9.6 billion. Of this, imports of agricultural machinery accounted for US$0.8 billion.

The economic crisis that occurred from the second half of 1997 had a very serious impact on all areas of the economy including the machinery industry. According to the Ministry of Industry and Trade, gross production in the machinery industry in 1998 was estimated as US$670 million, representing a decline to 44% of the previous year's value in US Dollar terms. The agricultural machinery industry, too, was no exception to this. Despite the fact that production of agricultural machinery in 1997 was already 40% lower than the peak production of US$47 million in 1996, it fell by a further 30% to US$20 million in 1998.

Looking at the situation regarding individual companies, some companies have maintained steady demand and production levels because they manufacture repair parts and components for domestic consumption. However, concerning the overall situation, due to the rapid falloff in demand, the overwhelming majority of companies are just managing to sustain operations through reducing work forces, cutting costs, temporarily suspending production, and so on. Among foreign affiliated companies, there are some which have increased exports through receiving support from their parent companies. However, due to the low international competitiveness of Indonesian products, such companies are still few in number.

In the agricultural machinery sector, although there is a strong need for mechanization, this is not being translated into actual demand. Many companies have pointed to the low income levels of farmers, the small size of cultivated land due to a preponderance of small-scale

farming, and underdevelopment of farm roads, as factors impeding the advance of mechanization. These companies stated a desire to see policies designed to promote the joint purchase and joint use of agricultural machinery, and policies for advancing infrastructure development in rural villages. Moreover, some foreign affiliated companies stated that, due to restrictions on the introduction of foreign capital to marketing and distribution areas, little progress is being made in the development of agricultural machinery suited to local needs. Furthermore, companies producing pumps and diesel engines, which occupy a relatively large weight within the machinery industry, pointed to intense competition from low price Chinese products. Through developing products suited to local needs and raising the quality and price competitiveness of cast parts and components, which are the major parts and components for the machinery sector, it is desirable for such companies to raise competitiveness in relation to imports.

Concerning foreign affiliated machinery manufacturers in 1997, business was good in the first half of the year in the areas of plant, transportation machinery and construction machinery. However, in the second half, due to the postponement of government projects, private sector's unwillingness to carry out capital investment and other effects caused by depreciation of the rupiah, there was a sudden fall in orders. Having said that, as a result of special demand conditions brought about by the need for drought countermeasures, the demand for pumps remained steady throughout 1997, and the demand for agricultural machinery was also relatively stable. Concerning foreign affiliated general machinery manufacturing in 1998, as a result of the domestic economic recession, domestic production and sales fell by between 30-70%. However, because of price increases brought about by depreciation of the rupiah, reverse exports to parent companies, and implementation of parts processing, etc., there are some companies which enjoyed increased revenue in rupiah terms. More companies are shifting sales from the domestic market to overseas markets. Since there is little prospect for recovery of the domestic economy and it is forecast that production will fall by 50-70% in the coming years, some companies are resorting to employee layoffs in an effort to cut costs.

According to the results of the interview survey conducted by the Ministry of Industry and Trade in October 1998 at 163 companies operating in the metal, machinery, electronics and chemical industries, measures taken by them against the impact of economic crisis are as shown in Table - 9.

Table -9 Results of MOIT Interview Survey

Measure		Yes	Measure	Yes
Suspension of Operation		33.4%	Reduction of Imported Raw Materials	46.4%
Reduction of Working Days		30.7%	Reduction of Imported Capital Goods	19.6%
Reduction of Shifts		31.3%	Cutting of Production	56.4%
Lay-offs	Restructuring Layoffs	28.3%	Contraction of Sales and Marketing Activities	55.2%
	Primary, Junior and High School Graduates	62.2%	Reduction of Exports	17.2%
	Skilled Workers	9.2%		
	Operators	4.3%		
	Skilled Welders	4.2%		

Source: November 6, 1998, Jakarta Post

Table -10 Flow of Production Value by Type of Industry

(Unit: US $ thousand)

No.	Type of Industry	1995	1996	1997	1998	
						%
1	Fabricated Machinery Industry	279,652	340,394	198,579	117,624	18
2	Agricultural Machinery Industry	46,114	47,198	29,172	20,168	3
3	Electronic Machinery Industry	234,206	264,505	181,507	96,350	14
4	Machine Tools Industry	12,033	11,383	7,558	7,555	1
5	Steel Construction Industry	272,260	285,317	251,588	178,318	27
6	Construction Machine Industry	9,253	9,010	6,531	5,498	1
7	Component Industry	398,928	417,625	370,345	214,012	32
8	Engineering Industry	43,291	59,651	54,205	25,610	4
9	Office & Household Furniture Industry	79,134	- *	- *	- *	- *
Total (Annual Growth Rate)		1,374,871	1,425,083 (11%)	1,184,862 (-17%)	665,135 (-44%)	100

Note : * 1996 and up, the Office & Household Furniture Ind. is managed by Directorate of Metal Industry

Sources : Activity Report 1997 and Data for Activity Report 1998 of MOIT

(2) Level of Localization

According to the 1998 annual activity report of the Ministry of Industry and Trade, Directorate of Machine Engineering Industry, the localization levels of the machinery industry are as follows:

i.	Machine devices:	From 47% to 91%
ii.	Agricultural machinery:	From 85% to 90%
iii.	Electronic machinery:	From 20% to 85%
iv.	Machine tools:	From 20% to 52%
v.	Construction machinery:	From 20% to 85%

According to the 1997/98 annual report of the Jakarta Japan Club, conditions regarding domestic production and exports in the general machinery industry are as indicated below.

i. Diesel Engines (excluding automobile engines)

   Small diesel engines (less than 50 HP) are almost totally produced domestically, except for some imported engines which require precision cast and forged parts and components. Concerning medium-size diesel engines (50-500 HP), there are some manufacturers which locally produce cast and forged parts and components. Concerning large-size diesel engines (more than 500 HP), there are three manufacturers (two state-owned enterprises and one private company), but these are at the stage of locally conducting machine processing (partially) and also assembling. Products are exported to a small extent.

ii. Generators

   Small capacity generators (less than 500 KVA) are produced locally. Concerning medium capacity generators (500-10,000 KVA), although casting and forging materials and insulation materials, etc., are imported, the localization rate of production ranges between 50-90% depending on the capacity of generators concerned.

iii. Pumps

   Not including special steel pumps and other special products, general purpose pumps (50-100) are almost totally produced locally and are even exported to ASEAN countries and the Middle East, etc. An attempt is being made to localize production of some special steel parts.

iv. Machine Tools

Some small-size general purpose machine tools are locally produced using imported drive units, hydraulic machines and control devices, but such production is still in the trial stage. Concerning some machine tools operated by CNC control, only CNC control sections are imported and other parts are locally produced. Many machine tools, however, are imported as finished products. All specialized machine tools are imported.

v. Agricultural Machinery

Large tractors are still only assembled locally, however, production of hand tractors is 100% localized and more local manufacturers are emerging in addition to Japanese affiliated companies. General agricultural machinery such as hulling machines, threshers and polishing machines, etc., has traditionally been produced locally.

vi. Haulage Machinery (Fork lifts)

Imports are still relied on to provide drive units, hydraulic machines and control devices, etc. However, in line with the intensification of price competition and the improvement of industrial standards, the range of localization is steadily expanding from sheet metal structures to batteries, tires, sheets and fenders, etc. Some components such as sheet metal structures are also exported.

vii. Construction Machinery (Bulldozers, excavators, wheel loaders, etc.)

Imports are relied on to provide drive units, hydraulic machines and control devices, etc. However, localization is advancing with respect to mainly small sheet metal structures. There are some companies which are already conducting the localized production of large sheet metal structures. Concerning cast and forged materials, the issue of heat treatment is the main impediment to future localization. The exporting of already localized components is carried out, and there are no imports of finished products except for special cases. Concerning excavators, some companies have achieved a local procurement rate as high as 55%. Export of Indonesian finished automobiles was started in earnest in 1994, and such exports are directed to the neighboring countries of Thailand and Malaysia.

(3) Impact of the Currency and Economic Crisis

As is indicated in Table-11, 98 of the 128 companies that responded to the questionnaire survey, or 76% of the total, reported that the impact on the businesses of machinery parts and components companies as a result of the currency and economic crisis was “very serious” or “serious”. Four companies reported a favorable impact, however, these are local companies that specialize in providing after-sales services, and it is thought that they have benefited from the fact that customers have switched to consigning repairs instead of replacing parts and components in line with the currency and economic crisis.

Table-11 Impact on Overall Business Activities

Unit : Number of companies

	Very Serious	Serious	Slightly Serious	No Impact	Beneficial Impact
Machinery parts manufacturers	50	48	16	10	4

Source: Questionnaire Survey, JICA Study Team

Table-12 Impact on Domestic Sales, Exports and Net Profit

Unit : Number of companies

	Decrease	No Change	Increase	Average Decrease Ratio (%)	Average Increase Ratio (%)
Domestic Sales	144	14	12	56.9	53.3
Exports	8	6	11	62.9	60.0
Net Profits	96	18	8	53.5	51.4

Source: Questionnaire Survey, JICA Study Team

Table-13 Reduction in the Number of Employees

	Average Number of Employees Before the Crisis	Average Number of Employees After the Crisis
Machinery parts manufacturers	92	53

Source: Questionnaire Survey, JICA Study Team
Note : Effective responses received from 28 companies

(4) Major Problems and Measures to be Taken

1) Marketing

Since the sales activities of almost all leading companies are conducted by the company owners themselves, and there are many companies which have no salesmen, they pay little attention to market development and find it difficult to develop new products. The following were pointed out by the companies visited as problems of marketing.

i. Almost all manufacturers conduct direct selling to a selected number of user companies and find it difficult to diversify sales activities.
ii. It is difficult for agricultural machinery manufacturers to make sales forecasts and production plans because dealers do not make orders based on their sales forecast but make orders only when they receive orders from customers.

For the expansion of agricultural equipment sales, it is effective to give distributorship rights to foreign affiliated manufacturers. If they can sell by themselves, they could actively develop agricultural equipment suited to cultivation conditions in Indonesia based on their marketing research and they will order attachment production to local subcontractors. At the same time, for the expansion of the demand for two-wheel cultivators and yield haulage machinery, it is necessary to develop farm roads in order that they can be used in the fields.

2) Financing

Companies are unable to obtain loans unless they have guarantees from a parent company, but parent companies do not provide guarantees in the present economic situation. They can purchase raw materials only by cash in advance. The major measures they follow are: a) to borrow from family groups and reduce borrowing from banks; b) to manage on accumulated internal funds; and c) to use initial payment money upon receipt of order as working capital.

3) Production management

Foreign affiliated companies and their subcontractors have established a basic and acceptable level of management setup. At local companies, production management system does not exist except for completion date control. However, local companies having foreign advisers are improving their production management level.

4) Quality control

Many local manufacturers do not possess measuring equipment and have not established quality control setups. Local companies exporting or selling to foreign affiliated companies must establish a quality control system because, without it, they can not continue to receive orders.

5) Raw materials procurement

Companies face high costs because almost all raw materials are imported. Because cheap local raw materials, in particular special steel materials, cannot be used in products due to poor quality, companies rely on imports from Japan, Europe and America and thus face problems in terms of delivery dates and cost. It will be desirable for the domestic production of high quality and low cost special steel materials to become possible in the near future. Local procurement of resins is also difficult.

6) Product development

In the present situation in Indonesia, it is difficult for companies to carry out product development. Local companies do not possess the human resources, equipment, devices and measuring equipment, etc., needed to perform product development. Market research to identify what kinds of products should be developed is also difficult for local manufacturers.

It is important for local manufacturers to start the training of necessary R&D personnel, and then proceed to the introduction of new facilities and equipment. Therefore, it is necessary to expand education and training institutions to develop R&D personnel in Indonesia.

7) Design

Indonesian companies have few designers. People involved in design must actively come up with new development ideas and must be capable of conducting repeated trial and error from the fabrication of prototypes through to testing and confirmation before completing products. It is not possible for them to carry out design without a basic understanding of manufacturing theory and industrial standards. Therefore, it is necessary to expand education and training institutions to develop capable designers.

(5) Reexamination of Priority Parts and Components

The evaluation results of the development priority of the Indonesian machinery industry by sub-group is shown in Table-14.

Based on the comparison of sub-groups in terms of competitiveness, market attractiveness, and localization needs, the priority for development should be given to agricultural machinery, metal work machinery, food processing machinery, metal cutting tools, and dies.

The development level of the machinery parts and components industry in Indonesia is currently lower than that of other ASEAN countries. Further, the immediate recovery of the market can not be expected. However, it is necessary to promote the development of internationally competitive machinery parts from the long-term perspective, because the growth period will come after the economic recovery.

As for the promotion of agricultural machinery, the agriculture sector is a key industry, providing food to 200 million people. It is necessary to develop agricultural machinery and equipment with high quality and high productivity for the diffusion of agricultural machinery and equipment in the agriculture sector. The diffusion of agricultural machinery and equipment has the effect of correcting the disparity among urban and local areas as well as enabling a stable provision of foods.

Considering the above, it is recommended that inexpensive, durable, and easy-to-operate agricultural machinery for small-hold farmers should be developed. The products to be developed at the initial stage are two-wheel hand tractors (cultivators), attachments for carrying out digging, leveling, planting and cutting, and crop haulage equipment for use with hand tractors.

For the development of the above mentioned agricultural machinery and equipment, it is recommended that cooperation among agricultural machinery dealers, agricultural machinery manufacturers, government R&D institutions, and universities be promoted. It will be an effective R&D method for agricultural machinery to establish model villages for mechanized farming where nearby institutions are conducting R&D and test prototype machinery under development at the villages.

Table -14 Comparison of Priority in the Industrial Machinery Sector

	Economic Merit			Technical Impact	Ease of Market Entry		International Competitiveness			
	Locali-zation Situatio n	Market Size	Market Growth Potential	Techno-logical Syner-getic Effect	Ease of Introduc-ing Tech-nology	Product-Ion and Invest-ment Scale	Domestic Related Technol-ogy Level	Mass Pro-duction Effect	Cost Competitiveness	
									Raw and Basic Materials	Labor Cost
	A: High B: Medium C: Low				A:Difficult B:Medium C:Easy		A: High B: Medium C: Low		A:Low B:Medium C: High	
Boilers	B	B	B	C	C	C	A	B	A	B
Steam engines and turbines	C	C	C	C	C	C	B	B	A	B
General purpose engines	C	A	A	C	B	B	B	A	A	B
Agricultural machinery	C	A	A	B	B	A	C	A	A	B
Construction machinery	C	A	A	B	B	A	B	A	B	B
Metal works machinery	C	A	A	A	A	A	C	A	A	B
Textile machinery	A	A	B	B	A	B	C	A	B	B
Food processing machinery	A	A	A	B	A	B	C	B	B	B
Timber, woodwork and plywood machinery	B	B	C	C	B	B	B	B	B	B
Pumps	B	B	A	C	C	C	A	B	B	C
Compressors and blowers	C	B	B	C	C	C	B	A	B	B
Cranes and conveyors, etc.	B	B	B	B	C	B	B	B	B	B
Office machinery and equipment	A	A	A	A	B	A	C	A	B	B
Sewing machines	C	C	C	C	C	B	B	A	B	B
Air conditioners and coolers	C	A	B	B	B	A	B	A	B	B
Game sets and other equipment	C	B	B	B	A	B	C	A	C	B
Metal cutting tools	C	B	A	A	A	B	C	B	A	B
Dies	B	A	A	A	A	A	C	B	A	B
Packaging and packing machinery	A	B	A	B	B	B	C	A	B	B
Industrial robots	C	B	B	B	A	A	C	A	A	B

(6) Macro Framework for the Development of Machinery Parts Industry

The most serious problems of the machinery industry in Indonesia are the inability to uphold delivery deadlines and to preserve high quality stability. Assemblers exporting their products do not purchase parts and components from suppliers which do not satisfy these two conditions. Even when parts and components manufacturers directly export to overseas markets, they are required to satisfy these conditions. The second most important problem is that there are several kinds of essential technologies needed by assemblers but not provided by local manufacturers.

The necessary measures to improve the QCD (quality, cost, and delivery) level of local machinery parts and components manufacturers are the change of workers' minds and renewal of machinery and equipment. If workers are satisfied with the existing level, these companies can not produce products accepted by assemblers or export their products. Therefore, it is necessary to carry out a company-wide renovation of attitude toward QCD, and improve QCD step by step. On the other hand, as long as obsolescent machinery and equipment are used and proper inspection equipment not used, workers can not improve their quality level. It is also necessary to introduce new machinery and equipment, and at the same time, improve factory management systems.

Second, it is necessary to develop essential technologies currently lacking in Indonesia and enrich the variety of the supporting industry to achieve the higher localization of the assembly industries. Although the government is promoting localization of the machinery industry, there are many essential technologies not satisfying assemblers' requirements in quality, cost, strength, and durability. The following seven essential technologies are to be developed for the machinery industry. For reference, the parts of multi-purpose engines which could be manufactured by these technologies are also shown.

i. Hot forging: crank shafts, connecting rods, lock arms, gears, knuckles, etc.
ii. Cold forging: constant velocity joints, mission shafts, counter shafts, gears, etc.
iii. Die casting: cylinder blocks, cases, covers, clutch housings, etc.
iv. Low pressure casting: cylinder heads, two-wheel shock absorbers, pistons, etc.
v. Sintering: final drive gears, meter gears, etc.
vi. Fine blanking: clutch plates, shift plates, final drives, etc.
vii. Nitriding treatment: mission shafts, deaf pins, molds and dies, etc.

The basic strategy for the development of the machinery parts and components industry should consist of two points. First is the promotion of the machinery assembling industry which can serve as the core for the development of the machinery parts and components industry. This is important because the machinery industry, as a whole, is under development and it can not offer good business opportunities for the parts and components industry. Second is the development of important essential technologies. The specific priority technologies are hot forging and cold forging.

In line with the above basic strategy, the following short-term development measures are proposed.

i. Nurture the agriculture machinery industry, because although potential demand for agricultural machinery exists within the country, it is not being expressed in the form of market needs due to various impediments.
ii. Since small-scale metal processing companies are concentrated in specific districts in Indonesia, adopt comprehensive support measures, incorporating marketing, business management and technology, in these districts.
iii. Provide financial support to companies that have succeeded in developing markets but are unable to take on orders due to a lack of funds.

As medium and long-term measures, the following are proposed.

i. Enhance the capabilities of public testing and research organizations and vitalize development technology dissemination activities, in order to raise elementary technology levels with respect to metal processing.
ii. In view of the fact that many small-scale companies operate in poor working environments, construct industrial estates and establish a relocation financial support system for small-scale metal processing companies.
iii. In the metal processing field, promote financial and technical cooperation with overseas companies that possess high level technology.
iv. Develop a high technology core machinery assembling industry through attracting overseas companies.

Framework for the Development of the Machinery Parts and Components Industry

(1) Basic Strategy

a. Development of a core machinery industry
b. Improvement of basic technology relating to metal processing

(2) Short Term Countermeasures

a. Provide comprehensive support in the areas of marketing, management and technology in districts where numerous metal processing companies are concentrated.
b. Provide financial support for manufacturers where there is a market demand.
c. Develop such machinery industries as agricultural machinery, where potentially large demand exists.

(3) Medium to Long Term Countermeasures

a. Enhance the capabilities of public R&D support organizations and disseminate basic technology for metal processing.
b. Improve working conditions in the metal processing industry through applying relocation funds and constructing industrial estates suited to the small-scale metal processing industry.
c. Promote capital and technology tie-ups between overseas manufacturing companies and local manufacturing companies.

Table –15 Current Conditions, Problems and Countermeasures in the Machinery Parts and Components Industry

Technology		Current Problems	Short Term Countermeasures	Long Term Countermeasures
Molding and Forming	Hot forging	Problems exist concerning yield, quality and delivery deadlines	Equipment renewal and improvement of mold and die precision	Acquisition of hot precision forging technology
	Cold forging	Although there is demand in the machinery parts and components industry, no companies exist		Introduction of cold forging and fostering of technology
	FC casting	There are numerous companies, but quality levels (including material quality) are low	Fostering of skilled workers through technical guidance	Introduction of casting automation
	Die casting	There are few companies and quality levels are low	Improvement of quality through die and mold fabrication and tie-ups	Equipment renewal
	Low pressure casting	There are few companies and quality levels are low	Fostering of skilled workers through technical guidance	Introduction of low pressure casting automation
	Sintering	There are numerous companies, but quality levels (including material quality) are low		Introduction of sintering lines and fostering of technology
	Pressing	There are numerous companies, but quality and deadline problems exist	Equipment renewal and improvement of mold and die precision	Introduction of transfer presses
	Fine blanking	Although demand from the assembly industry exists, there are no companies		Introduction of fine blanking
	Resin molding	There are numerous companies, but quality and deadline problems exist	Fostering of skilled workers through technical guidance	Introduction of large-scale equipment
Metal Cutting	Lathe working	There are numerous companies, but quality and deadline problems exist	Equipment renewal and improvement of cutting tools	Introduction of NC lathes and fostering of skilled workers
	Polishing	There are numerous companies, but quality and deadline problems exist	Equipment renewal and improvement of grindstones	Introduction of NC cutting machines and fostering of skilled workers
	Rolling	Although there is demand in the machinery parts and components industry, no companies exist	Introduction of rolling machines and fostering of engineers	Introduction of automated lines
	NC	Quality is poor because the few companies that possess this equipment cannot fully utilize it	Fostering of skilled workers and encouragement for equipment introduction (maintenance parts)	Introduction of general purpose automated lines (mass production)

Table –15　Current Conditions, Problems and Countermeasures in the Machinery Parts and Components Industry（Continued）

Technology		Current Problems	Short Term Countermeasures	Long Term Countermeasures
Metal Cutting	CNC	There are only a few companies, and there is a lack of skill in die and mold-related departments	Fostering of skilled machine workers	Introduction of CNC and CAD/CAM sets
	CAD/CAM	There are only a few companies, and there is a lack of skill in die and mold-related departments	Fostering of CAD/CAM engineers	
Heat Treatment	Carbonization quenching	There are few companies, quality is poor, and skills are lacking	Fostering of batch furnace workers	Introduction of continuous furnaces
	Nitriding	There is demand in the assembly industry, but hardly any companies exit	Introduction of equipment and fostering of skilled workers	
Surface Treatment	Plating	There are few companies and quality and deadline problems exist	Fostering of skilled workers, introduction of equipment and improvement of operating environments	
	Coating	Companies exist, but operating environments are poor and there are quality and deadline problems	Improvement of operating environments, establishment of control setups and fostering of skilled workers	
Mold/Die	Forging dies	Dies give poor yields and low precision	Fostering of skilled die workers and introduction of equipment	Introduction of CNC and CAD/CAM sets
	Casting dies	Dies give poor yields and low precision	Fostering of skilled die workers and introduction of equipment	Introduction of CNC and CAD/CAM sets
	Die casting dies	Dies give poor yields and low precision	Fostering of skilled die workers and introduction of equipment	Introduction of CNC and CAD/CAM sets
	Pressing dies	Form quality is poor and there are fluctuations in dimensional precision	Fostering of skilled die workers and introduction of equipment	Introduction of CNC and CAD/CAM sets
	Fine blanking			Introduction of CNC and CAD/CAM sets
	Resin dies	Dies give poor yields and low precision	Fostering of skilled die workers and introduction of equipment	Introduction of CNC and CAD/CAM sets

Note ： If new equipment can be successively developed locally through technical assistance from overseas and high quality machinery can be produced, this will enable to raise local procurement rates and will lead to industrial growth.

2.2. AUTOMOTIVE PARTS INDUSTRY

(1) Industry Trends

The automotive industry which mostly depends on domestic demand is one of the industries most adversely affected by the recent economic crisis in Indonesia. After recording average annual growth rates of around 20% since 1990, both domestic production and sales volume reached around 400 thousand units in 1997. However, the sales of cars decreased sharply to less than 60 thousand units in 1998. The sales volume of motorcycles which reached nearly 2 million units in 1997 also dropped sharply to the level of about 0.4 million units in 1998.

Table -16 Domestic Market Trend of Cars

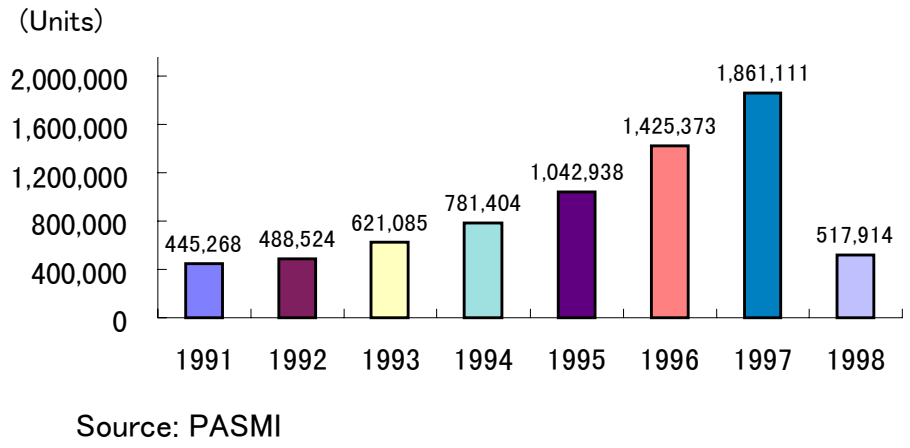
Unit : No. of cars

Category	1991	1992	1993	1994	1995	1996	1997	1998
Commercial Cars	215,569	139,527	178,448	281,541	340,859	288,121	313,476	46,380
Category I	157,153	108,758	137,592	225,695	270,303	217,675	38,453	35,650
Category II	40,061	16,194	21,582	33,802	46,826	52,018	5,967	5,444
Category III	11,850	4,432	7,416	15,970	16,714	12,330	1,045	955
Category IV	6,482	10,130	11,855	5,523	6,263	5,451	805	782
Category V	23	13	3	551	753	647	110	62
Passenger Cars	45,783	30,006	32,231	40,219	37,835	43,914	73,215	11,941
Total	261,307	169,533	210,679	321,760	378,694	332,035	386,691	58,321

Source: GAIKINDO

Note: Category I: GVW(Gross Vehicle Weight)≦5 tons
Category II: 5 tons＜GVW≦10 tons
Category III: 10 tons＜GVW≦24 tons
Category IV: General purpose 4X4 (Jeep)
Category V: 24 tons＜GVW

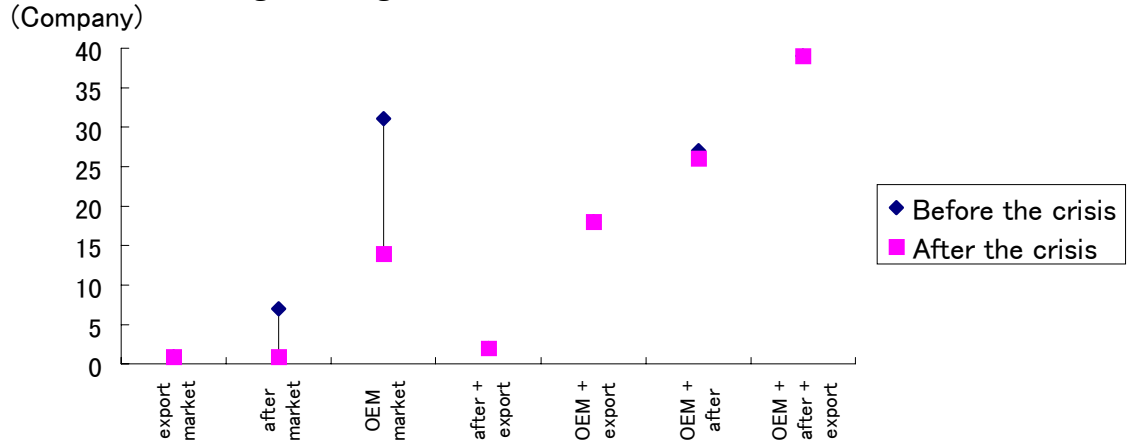
Fig.7 Production of Motorcycles



Source: PASMI

It was predicted before the crisis that the domestic market demand of cars would reach 600,000 units in 2000. In response to this forecast, most OEM parts and components manufacturers and some spare parts manufacturers increased their production capacity mainly in 1997 and early 1998. However, as the influence of the economic turmoil increasingly affected Indonesia, the situation of parts and components manufacturers worsened. For example, the number of manufacturers producing parts and components for OEM and the replacement market decreased sharply after the crisis in comparison with the number before the crisis.

Fig.8 Change in Situation of GIAMM Members



Source: GIAMM

A sharp decrease in production by assemblers has been directly connected to the severe decrease in production by parts and components manufacturers who mainly supply their products to assemblers. Some manufacturers have been forced to stop their production lines as most assemblers actually stopped assembling lines, while others continue operation at only 10 to 15% of full capacity. Because the influence of the economic turmoil is also clear in the replacement market and sales of spare parts are also falling sharply, parts and components manufacturers who are mainly dependent on the replacement market are also suffering from the sharp fall in production. As a result, thirteen member companies of GIAMM are now inactive. However, some manufacturers, who have exported their products for years and have a good relationship with overseas customers, are still increasing their exports.

(2) The Impact of Economic Crisis on the Automotive Parts Industry

According to the results of the questionnaire survey of the automotive parts and components industry carried out by the Study Team, the effects of the Asian economic crisis on the industry may be summarized as follows.

1) General Impact on Management

With regard to the impact of the economic crisis on businesses, 49.4% of the total 104 respondent companies said “Very serious.” When combined with the companies that answered “Serious,” this gives a figure of 81.7% of companies that have been seriously impacted by the crisis.

2) Impact on Domestic Sales

With regard to the impact that the economic crisis has had on domestic sales, 87.6% of respondent companies said that sales had “Decreased.” This means that practically all companies have experienced a drop in domestic sales. The rate of decrease in domestic sales was given as “from 75% to less than 100%” by 40.4% of respondents, and “from 50% to less than 75%” by 38.2%, meaning that a total of 78.6% of companies have

experienced over 50% decreases in domestic sales.

3) Impact on Operation Rates

As regards the impact on operating levels, these were 88.7%, on average, before the economic crisis, falling sharply to 40.3% afterwards. 8.9% of respondents gave their operating levels as "less than 10%," 26.7% as "from 10 to less than 25%," and 28.9% as "from 25 to less than 50%." Almost 65% of the total companies surveyed are experiencing a drop in operating levels to lower than 50%.

4) Impact on Exports

The economic crisis has had a major impact on exports. 40.9% of the surveyed businesses reported a decrease in exports. The rate of decrease in exports was reported as being "from 50 to less than 75%" by 50% of respondents. When this is totaled with those who reported a ratio of "from 25 to less than 50%," it can be seen that 83% of the surveyed businesses are experiencing severe drops in exports.

5) Impact on Corporate Profits

86.4% of the surveyed businesses reported that corporate profits were down. Practically all businesses have suffered some decrease in corporate profits. The rate of decrease in corporate profits was reported as being "from 75% to less than 100%" by 25.0% of respondents and "from 50% to less than 75%" by 37.5%, while 21.3% of respondents reported this figure as being "100% or greater." This means that a total of 84% of the surveyed companies have experienced 50% or greater decreases in corporate profits.

6) Impact on Employment

Considering the effect on employment, while the average number of employees prior to the economic crisis was 236 persons, this dropped to around half, to 132 persons, afterwards. Before the crisis, 33.3% of the businesses surveyed employed 100 persons or

over. In the wake of the crisis, this figure had dropped to 20.0% of companies. On the other hand, whereas the number of companies employing fewer than ten persons was 3.3% of the total before the crisis, this figure rose to 26.7% afterwards.

7) Countermeasures

With regard to countermeasures adopted in the face of the economic crisis, 71.4% of companies reported reducing the number of employees. Other than this, efforts to stimulate sales occupied the top positions, with “Development of new domestic markets” (45.7%) and “Development of new export markets” (41.9%). Additionally, a relatively high number of respondents reported measures such as “Product diversification” (31.4%), “Requesting support from parent company” (22.9%), and “Requesting assistance from financing organizations” (25.7%).

(3) Technological Level

The traditional efforts to improve localization rates and conventional management policies that were based on providing a level of quality suitable for the Indonesian market were changed. In order to respond to the market shrinkage that has accompanied the economic crisis, companies are aiming for improved competitiveness in terms of a level of quality suitable for mutual complement of parts and components within the ASEAN region and export, and reduced costs. This has resulted in demands for product specifications to be reviewed in order to encourage the manufacture of products whose quality can meet global standards, as well as cost reductions and lowering of failure rates. Enterprises in the parts and components industry have widely differing levels of technological competency, and may be grouped as follows.

Group 1 : This group comprises component manufacturers that manufacture a completed part or component, as part of a joint venture or technical tie-up, and those which export fabricated parts as an assembler, and have a technical level that is globally competitive in QCD. Some 85% of the parts manufacturers with which assemblers deal are either joint

ventures or technical tie-up companies with foreign manufacturers.

Group 2 : This group comprises companies that produce sub parts and components, and supply to parts and component manufacturers and assemblers, and whose technical levels vary over a considerable range. There are joint venture and technical tie-up companies, as well as local enterprises. In order to keep pace with parts export trends, considerable reductions in failure rates, and improvements in yield, are required.

Group 3 : These are small, local enterprises that require improvements in production facilities and production management, as well as in the area of quality management. In particular, there are many whose production facilities tend to be in dilapidated condition and are unable to provide products with the consistent accuracy required by the automotive industry, and who carry out adjustments and finishing by hand. These companies are unable to handle orders for high added value products. In addition, they suffer from a lack of capital and management resources, and have little scope for improvement, due to reduced orders.

Table -17 Parts and Components Manufacturer Classifications

Classification				Manufacturing	Export
Group 1	Components assemblers		JV	Specified Lines	P
	Parts manufacturers		JV/Technical assistance	Specified Lines	P
Group 2	Sub-parts suppliers	Casting	JV/Technical assistance	-	P
		Presswork	Technical assistance	-	P
		Dies/ Jigs & Fixtures	JV/Technical assistance	-	D
Group 3	Sub-parts suppliers	Casting	Indonesian	-	P
		Presswork	Indonesian	-	D
		Machining	Indonesian	-	D
		Dies/ Jigs & Fixtures	Indonesian	-	D

Source: JICA Study Team
Note: P shows possibility and D shows difficulty

(4) Major Problems and Measures to be Taken

The major problems of automotive parts and components manufacturers can be classified into those of short-term and medium/long-term.

(1) Short-term Problems

i. The sharp shrinkage of the domestic market for both OEM and the replacement market and the unlikely recovery of the market especially for OEM parts and components at least for the next few years
ii. An increase in production costs as the result of increases in costs for imported raw materials such as steel, due to the sharp depreciation of the rupiah
iii. The burden of the recent expansion in investment in response to the optimistic market estimation of approximately 600,000 units per annum in the case of cars and 2 million units per annum in the case of motorcycles
iv. The stock of raw materials is estimated at more than one year in response to the previous market estimation and due to the sharp fall in domestic demand
v. The difficulty in raising sales prices in response to the increase in production costs
vi. The difficulty in finding financial institutions who are eager to lend working capital
vii. The high interest rate burden of working capital for raw materials procurement
viii. The difficulty in developing overseas markets by themselves

(2) Medium/Long-term Problems

i. Specialized production equipment for automotive parts and components and difficulty in producing other kinds of parts and components such as those for agricultural machinery and electric appliances in most cases
ii. Dependence on imported raw materials and parts and components
iii. Still insufficient technological level for export
iv. Undeveloped domestic raw material industries
v. Limitation of information on overseas market

By types of product, the following improvement measures are needed.

1) Currently Exported Parts and Components: Improvement of competitiveness

Aluminum die cast parts and cast iron parts, etc., are cost competitive and have a good export track record. However, the current failure rate is high (5 to 10%), and improvements in production management and production engineering, staff training for quality improvement, and strict adherence to delivery dates are the minimum requirements if the industry is to survive. In particular, there is a very low awareness of quality assurance in the current manufacturing processes, and the brunt has to be borne in the final processes. This kind of production system needs to be improved. For example, in the best local companies, Japanese made Machining Centers（MCs） and NC lathes are being introduced into the final machining processes, but problem areas in mold quality and casting conditions management are covered by using a lot of machine processing and cheap labor.

In order to produce products that will satisfy the customers, there needs to be quality assurance at every step in the manufacturing process. This enables cost assurance, quality assurance and delivery assurance.

2) New and potentially competitive Products in Indonesia: Development

Companies are to select from current products those that have the potential to be competitive, and to improve technical capability to manufacture high added value products.

a. Presswork

Currently, there are many companies importing high precision molds. The quality of the molds being used by Indonesian companies is rather poor and they cannot cope with production of high precision parts and components, so they cannot get orders for

high added value parts from assemblers and joint venture components manufacturers.

b: Aluminum Casting

Parts and components that require very high quality, such as cylinder heads and crank cases, are either produced in-house or imported. The expansion of work volume, and the manufacture of high added value parts, will require better technological skills, and the study of technologies such as low pressure casting, etc.

c. Molds

Currently, high precision molds and large scale molds are imported. The quality of the molds being used by Indonesian companies is rather poor, and important parts and components are either produced in-house or imported.

There is a high level of customer demand for cheap, domestically produced molds. Domestic production of molds would not only keep costs low, but would also make shorter repair and supply schedules possible, as well as improving delivery management. In order to improve parts export competitiveness and to win orders for high added value parts and components, there need to be highly competent mold manufacturing companies.

3) High Valued Added Parts and Components: Localization

In Indonesia, parts manufacture is mainly that of low added value parts, with high added value parts being produced by joint ventures or imported. In the future, there is likely to be more and more mutual complementation of parts by the assemblers and joint venture components manufacturers. If Indonesian industries are to survive, they will need to shift from manufacture of the current low added value parts and components to that of higher added value parts, and to do this, they will need to formulate business strategies and

strengthen their marketing.

(5) Macro Framework for the Development of Automotive Parts Industry

1) Reconsideration of Priority Products

The screening of the priority parts and components was conducted based on the Team experts' experience. The results of the selection work and the measures to develop the selected priority products are summarized as follows.

Table-18 Priority Automotive Parts and Components and Development Direction

Group 1: Parts and components which have already been exported but need to be more competitive for further expansion of market Air Filters, Fuel Filters, Oil Filters, Clutch Facings, Shock Absorbers, Batteries, Control Cables, Electric Parts, Tires, Wiring Harnesses, Spark Plugs
The current export value is large. They can be said to have competitiveness in the international market at present. In order for Indonesia to be selected as a production base for principals' international mutual procurement of parts and components, an increase in competitiveness through rationalization and modernization of production systems is necessary. Activities aiming at the development of the overseas market in cooperation with the government are necessary in line with the improvement of competitiveness of parts and components.
Group 2: Parts and components which have the potential to be competitive in the international market Radiators, Pistons & Piston Rings, Transmission Cases, Clutch Housings, Clutch Covers, Safety Glass, Air Conditioners
These are parts and components which have already been localized substantially. For this, they have good potential of being competitive in the international market. Principals' decision for mutual procurement through the AICO Scheme or through their international procurement plan is also a very important factor to select potential parts and components. Modernization of manufacturing technology and equipment as well as further localization is necessary to be more competitive in the international market. Further improvement in reduction of costs through an increase in local procurement and added value is necessary to be competitive.
Group 3: Parts and components which should be localized for a further increase in

localization Engine parts and components, High precision press parts, Bolts and Springs, Dies and molds
These are crucial parts and components which should be localized rapidly. They are recognized as priority parts and components for localization by assemblers. Invitation of investment by leading overseas parts and components manufacturers and promotion of capital and technical tie-ups between overseas manufacturers and domestic ones are effective. In addition, for the development of supporting industry, precise dies and molds technology, specific high value added casting and forging technology, in addition to precise machining technology for supporting production of engine parts and components, cold rolling forging, heat treatment technology for production of precise bolts and springs, and high precision presswork technology should be developed.

Source: JICA Study Team

2) Macro Framework for Future Development

Based on the results of both 1) the analysis of the current industry situation and its major problems and countermeasures to those problems, and 2) the selection study of priority parts and components groups, the Indonesian automotive parts and components industry were divided into three distinct groups, and the macro framework for development strategy by group was considered. The results of grouping are as follows.

1st Group: Primary subcontractors, supplying products and/or services directly to the automobile assemblers. These are principally joint ventures with foreign companies, or Indonesian companies having technical collaboration relationship with foreign manufacturers.

2nd Group: Secondary and tertiary subcontractors, supplying the first group with parts and/or services. These are mainly small to medium sized Indonesian companies.

3rd Group: These are companies that currently do not have the ability to supply to OEM parts manufacturers, but have the potential to become secondary or tertiary subcontractors in the future. The large majority of them are very small Indonesian businesses.

The primary subcontractors, which mainly comprise foreign affiliated companies, are facing a variety of problems, including (a) the fact that they have technical skills at internationally accepted levels, but lack price competitiveness in terms of production volume. (b) Due to the drastic drop in domestic demand, their burden of fixed overheads has increased, further reducing their price competitiveness. On top of this set of circumstances, there is (c) the added pressure of the reduction of tariff protection according to localization levels, and the lowering of tariffs within the ASEAN region, and (d) the fact that many of these companies have invested in specialized equipment for the manufacture of very specific automotive parts and components, making it very difficult for them to switch to other work, etc.

As short term measures for these companies, (1) the companies should be concentrating on their own production, and duties on imported parts and components should be set so as to allow these companies some breathing space until they can gain international competitiveness by developing products for export, and careful import duty policies need to be adopted in order to lessen duties on imported raw materials and parts, which are a major reason for high product costs. (2) Among the parts and components companies that cannot survive with the current level of demand, there are some that are considering making a complete change of business. Because they do possess a high level of technical skill, these companies have the potential to become valuable supporting industries to other industries. These could be helped by the adoption of policies to facilitate changes in investment approval for changes of businesses lines or diversification of products, and to relax foreign ownership restrictions in order to facilitate export expansion. Also, (3) there should be stronger export marketing support for those companies that lack export experience. As mid to long term strategies, there needs to be (1) the development of the necessary infrastructure, in order to improve international competitive strength, (2) fuller and more complete education and training facilities for the improvement of employees' technical skill levels, (3) readjustment of import costs for the development of companies in the secondary subcontractor group and (4) measures to attract foreign companies with export competitive strength.

Among the many problems facing the secondary subcontractor group, which mainly comprises small and medium sized indigenous companies, are (a) the sudden decrease in domestic demand, (b) the soaring costs of raw materials and the difficulty in obtaining them,

and (c) the drying up of funding for working capital following the collapse of the financial markets. Suggestions for short term solutions to the problems faced by these companies include (1) reinforced marketing support in order to improve linkage with primary sub-contractors, etc., (2) on-site instruction for the improvement of technical skill levels, (3) assistance for the improvement of business management and marketing skill levels and (4) financial support in order to secure working capital. Mid to long term strategies should include (1) from among parts that still have a high degree of reliance on imports, select those whose cost competitiveness could be improved by increasing local content, and promote these by providing increased support for companies in the areas of technical skill level and business management skill level improvement, etc., and (2) the expansion of mid to long term financing in order to encourage plant modernization.

Measures to assist those small businesses that do not have the capacity to enter the OEM market are basically the same as those proposed for the secondary sub-contractor group. However, as these companies do tend be quite small in scale, emphasis should be placed on measures such as (1) locally focused support strategies and (2) the organizing of small businesses into cooperative societies or the construction of business networks within specific local areas, in order to win joint orders, etc.

Table-19 Summary of Macro Policy Framework

Current Major Problems	Short-term Policy	Middle & Long-term Policy
Group I: First tier manufacturers		
1) Technical levels are high but cost competitiveness is low due to small volume 2) Due to sudden drop of domestic demand, cost competitiveness has further weakened 3) Import duty protection is going to be taken off soon 4) Due to the installment of specialized machines, product diversification is not easy	1) Customs duty policy which gives them enough time to strengthen their product competitiveness by such measures as production concentration 2) Ease of production license or foreign ownership restriction which enables them to increase export or to change or diversify their production items 3) Export promotion support for those local firms which do not have enough export experience	1) Enhancement of international competitiveness by improving related infrastructure 2) Improvement of technical levels of workers both by training and education 3) Development of Group II industries which enhance their cost competitiveness 4) Invitation of foreign investment which targets export markets as well as the domestic market
Group II: Second and third tier subcontractors		
1) Sudden drop of domestic market demand 2) Increase in imported material costs 3) Lack of working capital	1) Marketing support which could link them with Group I industries 2) Strengthening technical capabilities 3) Strengthening marketing and management capabilities 4) Strengthening of working capital assistance programs	5) Strengthening their management and technical capabilities so that they could move further into the areas of import substitution 6) Financial and technical support in order for them to expand their service activities
Group III: Potential second and third tier subcontractors		
1) Very weak technical and management capabilities 2) Very limited and shrinking domestic market	Basically the same as Group II, however, higher emphasis should be placed on 1) local based technical and management support services, and 2) grouping them into large organizations such as cooperatives	Basically the same as Group II, however, higher emphasis should be placed on 1) local based technical and management support services, and 2) grouping them into large organizations such as cooperatives

Source: JICA Study Team

2.3. ELECTRIC AND ELECTRONIC PARTS INDUSTRY

(1) Industry Trends

The Indonesian electric and electronic industry has undergone rapid expansion in recent years. According to the Indonesian Ministry of Industry and Trade, the electric and electronic industry is made up of some 700 assemblers, and parts and components manufacturers.

Table -20 Size of the Indonesian Electric and Electronic Industry

	1989	1996	1997	1998
Total Production (Rp. billion)	1,620	15,770	17,170	31,570
Overall Investment (Rp. billion)	0.149	1.480	1.445	1.405
Export Value (US$ billion)	179	3,911	3,898	3,758
Number of Employees (No.)	1,617	39,374	29,095	12,382

Source: "Laporan Kegiatan Direktorat Industri Elektronika 1998," MOIT
Note : Total production includes both finished product production and parts and components production.

The production value of the electric and electronic products (excluding parts and components) had grown significantly, which had tripled to Rp. 12.2 trillion by 1996 from Rp. 4.3 trillion in 1992.

Table –20 Production Flow of Electric and Electronic Products in Indonesia

Unit: Billion Rp.

	1992	1993	1994	1995	1996	1997	1998
Consumer Products	3,060	4,005	5,006	7,735	8,584	5,520	9,074
Electronic Consumer Products	1,819	2,550	3,187	5,089	6,354	4,677	6,846
Electric Consumer Products	1,242	1,455	1,818	2,646	2,230	842	2,228
Business/Industrial Products	1,237	1,509	1,837	2,952	3,592	3,513	5,130
Telecommunications	622	496	621	900	1,739	805	2,014
Data Processing	259	363	454	793	1,026	1,085	1,004
Office Equipment	37	101	155	246	225	390	425
Industrial Equipment	8	37	64	120	99	38	38
Medical Equipment	1	2	3	7	22	64	187
Optical Equipment	168	319	280	405	359	924	1,098
Others	143	190	261	482	121	206	365
Total	4,298	5,514	6,843	10,687	12,176	9,032	14,204

Source: "Laporan Kegiatan Direktorat Industri Elektronika 1998," MOIT

Production of both consumer goods and industrial goods had grown significantly, and the growth in production of consumer goods due to rapid foreign investment was particularly fast. As a result, electronic consumer goods accounted for over half of the production value of electric and electronic goods in 1996. Electronic consumer goods include color TVs, black and white TVs, VCRs, and other audio equipment. In 1997, VCRs accounted for 57% of the total figure, and had become the major production item. Then, in 1997, Asia was beset by currency and economic crises, the effects of which stalled domestic sales and exports, causing domestic production of electric and electronic goods to fall.

Electric and electronic parts and components which are manufactured in Indonesia include such items as PCBs, CRTs, wire-harnesses, capacitors, transformers and semiconductors. Also manufactured in Indonesia are mechanical components that require quite a high level of technical engineering. However, such parts and components are invariably manufactured by Japanese or other foreign owned companies, and purely Indonesian production of electric and electronic parts and components is extremely rare. Further, the raw materials for the products manufactured by foreign firms, such as metal plates, copper wire, plastic resin and chemical products, are practically all imported. Local companies tend to lack technology, equipment, capital and human resources, etc., so that it is virtually impossible for them to produce parts and components that meet the requirements of assemblers, in terms of quality, delivery and price.

The electric and electronic parts and components industry in Indonesia has developed along with the export industry. There is also an increasing number of multinational companies that are moving their factories to Indonesia, rather than Singapore or Malaysia, where labor costs have increased dramatically. These companies see the electric and electronic industry in Indonesia as a base for exports to Asia and the rest of the world, and are aiming at expansion of production.

As for production trend, the total domestic production was Rp. 0.9 trillion in 1992, and grew to approximately 14 times that, or Rp. 13 trillion, by 1998. The rapid growth in terms of rupiah was mainly due to the rapid depreciation of the rupiah in 1997 and 1998. Therefore, the actual output of the industry is thought to have been stable in the last several years. As

for exports, during the period between 1992 and 1998, they increased by 5.1 times, while imports decreased by some 50%. The growth in exports is particularly noticeable, and exports of parts and components had grown to some 41.3% of the total export value of electric and electronic goods and parts and components by 1998.

As for the breakdown of exported parts and components, in addition to the traditional power supply transformers, connectors, speakers and antennae, etc., exports of more added value parts and components, such as CRTs, PCBs, ICs, and crystal oscillators, have increased rapidly. The electric and electronic parts industry has become more advanced, due to the emergence of foreign owned firms, and is developing as an export industry. In particular, even during 1997 and 1998, which saw the currency and economic crises, exports of electric and electronic parts and components continued to increase, and helped to support sagging domestic demand. On the other hand, imports of electric and electronic parts and components peaked in 1995, and then began to decrease after that. This was partly because many parts and components that had hitherto been imported were now being supplied domestically. Also, in 1997 and 1998, the value of imports shrank by 11.0% and 60.6%, respectively, from the previous years. This is believed to be a temporary phenomenon, brought about by a reduction in the numbers of parts and components required for electric and electronic goods for the domestic market. Parts and components that require sophisticated manufacturing techniques, or whose domestic manufacture would increase overall costs, are still likely to depend on imports, and it is expected that when Indonesia's economy begins to recover, imports will once again begin to post healthy increases.

Table-22 Production Flow of Electric and Electronic Parts in Indonesia

Unit: Billion Rp.

	1992	1993	1994	1995	1996	1997	1998
Components	199	307	490	762	984	1,443	2,766
Active Components	130	102	234	357	585	851	1,778
Passive Components	69	205	256	404	399	592	989
Parts	707	704	1,490	2,483	2,613	4,800	10,279
Electromechanical Parts	205	227	429	708	761	1,110	2,485
Specific Parts	502	477	1,061	1,775	1,853	3,690	7,794
Total	906	1,011	1,980	3,244	3,598	6,243	13,045

Source: “Laporan Kegiatan Direktorat Industri Elektronika 1998,” MOIT

Table-23 Export and Import Flow of Electric and Electronic Parts

Unit: Million US$

	1992	1993	1994	1995	1996	1997	1998
Export	306	401	742	960	1,318	1,458	1,553
Components	87	113	190	242	343	347	329
Active Components	61	49	106	140	212	207	212
Passive Components	27	64	84	103	130	140	118
Parts	219	288	552	718	975	1,112	1,224
Electromechanical Parts	48	104	161	192	272	258	296
Specific Parts	171	184	390	527	703	854	928
Import	1,144	1,518	1,454	1,800	1,651	1,470	579
Components	392	542	594	670	496	432	178
Active Components	192	303	328	396	336	218	109
Passive Components	200	239	266	273	159	214	69
Parts	752	976	860	1,130	1,156	1,037	401
Electromechanical Parts	167	329	270	435	428	280	82
Specific Parts	585	646	590	696	727	757	319

Source: “Laporan Kegiatan Direktorat Industri Elektronika 1998,” MOIT

(2) Structure of the Industry

The structure of the electric and electronic parts and components industry in Indonesia, in the same way as the electric and electronic assembler sector, is largely divided into foreign affiliated companies, including joint ventures with foreign capital, and local companies. Moreover, almost all assemblers are promoting the in-house production of parts and components. In particular, there are many local assemblers which have an in-house parts and components production rate of close to 100%.

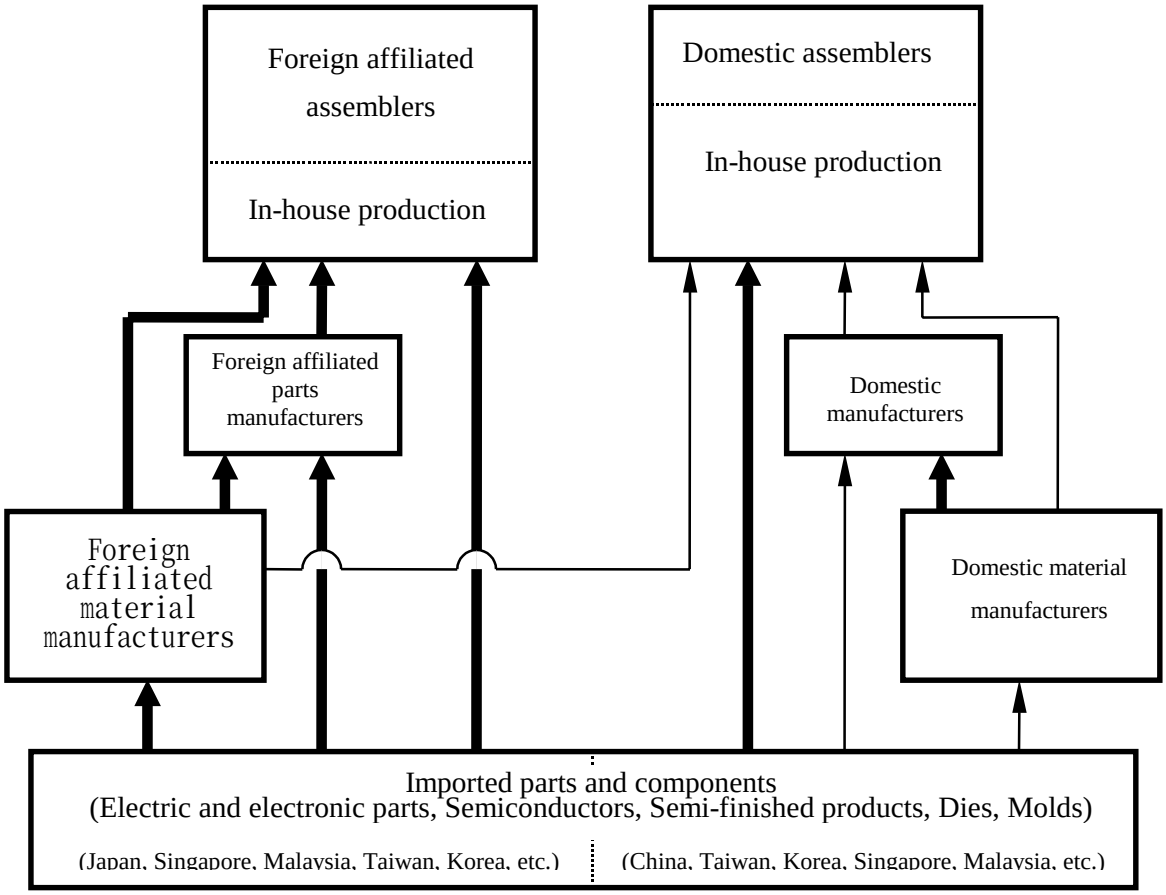
Almost all foreign affiliated electric and electronic parts companies operate tax exempted factories; therefore, almost all of them import raw materials and microchips by utilizing special tariff exemptions. These companies often import from technically advanced countries, such as Japan, Singapore and Malaysia. Even when such materials and microchips are procured within Indonesia, it is almost always from foreign affiliated companies.

As for the local parts and components industry, there are only a few companies which produce single item parts. It is more common for companies to produce PCB-based semi-assembled products and components or finished products. Moreover, many local assemblers carry out in-house production of almost all parts and adopt integrated production setups for making finished products. Doing this enables such companies to control quality and prevent variations and allows them to independently procure cheap materials and parts from numerous sources, thus allowing them to reduce costs.

Disparities from the top to the bottom of the local parts and components industry in Indonesia are large. At the so-called electronics village known as Kuningan, five small enterprises (there were previously 26 before the crisis) produce capacitors, PCBs, resistors, transformers, audio equipment, AC adapters, etc. However, these companies largely rely on manual work and the reliability of their product quality is considered to be low. For example, transformer insulation wires are wound on by hand and the fitting and soldering of electronic microchips to PCBs is also carried out manually. In addition, production volume is very small, so the development of the industry cannot be expected.

In contrast, a telecommunications equipment maker in Bandung carries out all its own work, starting from the design of PCB circuits through to the 100% inspection of components, assemblies and finished products. In response to the contraction of the domestic market, this company has put advertisements in Hong Kong industry publications and has started exporting to Malaysia, among other steps.

Fig.-9 Structure of the Electric and Electronic Industry



Note: ➡ Strong relationship; → Weak relationship

The typical case of local procurement by electric and electronic assemblers in Indonesia, in terms of the kinds of finished products and major types of parts and components, is shown in Table-24.

Table-24 Typical Cases of Procurement of Electric and Electronic Parts

Field	Target Product	Raw Materials, Parts, Components, etc.	Method of Manufacture and Procurement	
			Foreign Affiliated assemblers	Local Assemblers
Electric Product and Domestic Electrical Appliances	Color TVs	Plastic materials,	Imports/Some local purchasing Japanese affiliates /some local injection molding (but mold are imported)	Imports/local Companies Mostly in-house production/Some local molding (but molds are imported)
		Plastic cabinets,	Mostly in-house production, importing and purchasing from Japanese affiliates	Mostly in-house production (parts are imported),
		Components Metal parts,	Molding by Japanese affiliates (models are imported)	Mostly in-house production /some local molding
		Electronic Parts,	Imports /Some purchasing from Japanese Affiliates	Imports (Singapore, Malaysia, etc.),
		Small plastic parts	Japanese affiliates/some local injection molding	Mostly in-house production/some local molding
Electric Product and Domestic Electrical Appliances	Irons	Plastic parts	Local molding (molds are imported),	In-house production (molds are also produced in house)
		Die cast parts	Die cast parts	In-house production (molds are also produced in-house)
		Press forming products	Local press forming (dies are imported)	In-house production (dies are also produced in-house)
		Heating elements	Imports (Japan)	Imports (Thailand, Japan)
		Insulators	Imports (Japan)	Imports (Japan) (Processing is in house)
		Small parts (Switches, etc.)	Local press forming (dies are imported)	In-house production (dies also produced in-house)
Electric Product and Domestic Electrical Appliances	Electric Fans	Plastic bodies	Local Production (molds are imported)	In-house production (molds are imported or produced in-house)
		Press forming parts	Local Production (dies are imported)	In-house production (dies are imported or produced in-house)
		Plastic fans	Local Production (molds are imported)	In-house production (molds are imported or produced in-house)
		Motors	In-house production (molds are imported)	Imports (Taiwan)
		Small parts (switches, etc.)	In-house production (automated) or imports	In-house production (dies are imported are produced in-house)
		Electronic equipment and parts, etc.	Imports (Japan, Singapore)	No equipment is attached
		Guard nets	In-house production (automated)	Local or in-house production (manual)

Table-24 Typical Cases of Procurement of Electric and Electronic Parts (continued)

Field	Target Product	Raw Materials, Parts, Components, etc.	Method of Manufacture and Procurement	
			Foreign Affiliated assemblers	Local Assemblers
Electronic Equipment	Microwave Ovens	Cabinets	Sheeting metal forming is ordered locally	Sheeting metal forming is ordered locally
		Circuit design	In-house production (software is independently developed)	In-house production (software development also)
		PCBs	Imports/Some purchasing from foreign affiliates	Purchased locally and assembled in-house
		Components	Imports (Japan, Singapore)	Imports (some purchased locally)
		Transformers	Imports (Japan, Singapore)	Purchased locally (Bandung)
		Electronic parts and elements	Imports (Japan, Singapore)	Imports (Singapore, Malaysia)
	Computers	Plastic Cabinets	Local press forming (dies are imported)	Local press forming (dies are imported)
		Circuit design	In-house production	Not possible
		PCBs	Imports (Singapore)	Imports (China, Taiwan)
		Components	Imports (Singapore)	Imports (China, Taiwan)
		Electronic parts and microchips	Imports (Singapore)	Imports (China, Taiwan)

(3) Impact of Economic Crisis on the Electric and Electronic Parts Industry

1) Impact on business

Table-25 provides a summary of the general impact of the currency/ economic crisis on the business of companies in the electrical and electronic parts and components industry. Only one company reported that there had been a favorable effect. Of the 88 companies surveyed, 84 responded that they had experienced some kind of effect. The impact was more serious in local companies compared with foreign affiliated companies. However, there was no appreciable difference between the responses of companies whose main business is domestic sales, and those concentrating on exports. It is likely that those involved in domestic sales found their business impacted by the stagnation of the Indonesian economy, and those involved in exports found their business impacted by economic stagnation in the Asian region. When viewed by workforce size, of the 30 companies who responded that the impact was “very serious,” 7 had 19 or fewer employees, and it would appear that, in general, the smaller scale companies have been

more seriously impacted by the currency/ economic crisis than larger companies have.

Table-25 General Impact of the Economic Crisis on Business

Unit : No. of companies

		Impact of the Currency and Economic Crisis				
		Very Serious	Serious	Some	No Impact	Good
Total Respondents		34	26	24	3	1
Capital Ownership	Domestic	25	15	14	1	1
	Foreign Affiliated	9	11	10	3	0
Sales	Domestic	17	13	7	1	0
	Export	17	13	17	2	1
Number of Employees	19 or fewer	7	2	3	1	0
	20 to 99	9	6	4	0	1
	100 to 299	6	3	4	1	0
	300 or more	8	12	11	1	0

Source : Questionnaire Survey, JICA Study Team

The effect of the crises on business can be seen in the form of reduced corporate profits. As shown in Table -26, of the 87 companies that responded, 62 reported reduced corporate profits. The effect of the crisis was equally severe in almost all kinds of companies.

Table-26 Impact of the Economic Crisis on Corporate Profits

(Unit: No. of companies)

		Change in Corporate Profits		
		Decrease	No Change	Increase
Total Respondents		62	9	6
Capital Ownership	Domestic	41	4	4
	Foreign Affiliated	21	5	2
Sales	Domestic	30	3	0
	Export	32	6	6
Number of Employees	19 or fewer	9	3	0
	20 to 99	15	0	2
	100 to 299	10	2	0
	300 or more	22	4	4

Source : Questionnaire Survey, JICA Study Team

2) Impact on domestic sales

Table-27 summarizes the impact of the currency/ economic crisis on domestic sales. Of 80 companies that responded to this item, 67 companies, or 84%, reported that domestic sales had declined. Broken down by capital, in comparison with foreign affiliated companies, the decline in sales is slightly noticeable in local companies. However, 23 out of 29 foreign affiliates did report that domestic sales were down, indicating that both foreign affiliates and local companies have experienced a decline in domestic sales, as a result of the economic crisis.

Table-27 Impact of the Economic Crisis on Domestic Sales

(Unit: No. of companies)

		Change in Domestic Sales		
		Decrease	No Change	Increase
Total Respondents		67	11	2
Capital	Domestic	44	6	1
	Foreign Affiliated	23	5	1
Sales	Domestic	33	3	0
	Export	34	8	2
Number of Employees	19 or fewer	11	2	0
	20 to 99	18	1	1
	100 to 299	9	2	1
	300 or more	22	5	0

Source : Questionnaire Survey, JICA Study Team

3) Impact on exports

Table-28 summarizes the effect of the economic crisis on exports. In comparison with the impact on domestic sales, the impact on exports is less. In the case of foreign affiliates, there were roughly equal numbers of companies that reported that exports were down, and those that reported that exports were up. Overall, there is no real evidence of the negative impact of the currency/economic crisis. In fact, 11 companies reported that exports had increased. The main reasons for increased exports are i) the increased international competitiveness of goods, due to the substantial devaluation of the rupiah, and ii) reduced production costs, such as labor and utilities, etc., in dollar based amounts. In other words, many companies that are exporting manage their internal costs in dollars, and the devaluation of the rupiah had a positive effect in terms of lowering costs.

Table-28 Impact of the Economic Crisis on Exports

Unit : No. of companies

		Change in Exports		
		Decrease	No Change	Increase
Total Respondents		28	13	11
Capital	Domestic	14	3	8
	Foreign Affiliated	14	10	3
Sales	Domestic	8	1	1
	Export	20	12	10
Number of Employees	19 or fewer	4	0	0
	20 to 99	2	1	2
	100 to 299	3	3	3
	300 or more	15	8	5

Source : Questionnaire Survey, JICA Study Team

4) Countermeasures

As for the countermeasures taken in response to the currency/ economic crisis, of the 86 companies that responded to this item, 54%, or 46 companies, indicated “development of new export markets.” On the other hand, only 29 companies mentioned “development of new domestic markets.” This would indicate that, faced with a drastic drop in domestic demand, the majority of companies in the electrical and electronic parts and components industry have chosen to try to find a way out of their difficulties by turning to exports. Over half, 43, of the companies indicated “workforce reduction” as a response to the economic crisis. In particular, most of the companies that opted to reduce their workforce were local companies, adopting a retrogressive response to declining sales.

(4) Major Problems and Measures to be Taken

1) Technical Issues and Required Improvements

The electric and electronic parts industry in Indonesia continues to rely almost exclusively on foreign affiliated companies and imports from Japan, Singapore and other countries, to provide precision press forming parts, engineering plastic products, ICs, lead frames, PCBs, etc., and there are hardly any local companies which make these items. Here for the sake of convenience, parts shall be classified into 1) parts, 2) injection molding and press forming products (including molds and dies), and 3) components, and problems and improvement

measures were given for each.

Parts are divided into mechanical parts made by machine processing, etc., and electronic microchips such as ICs, etc. Concerning the latter, only a very small proportion of such parts are made locally. Since almost all such parts are imported in ample supply and at high quality levels and the industry for such parts has become highly advanced in Japan, Singapore and Malaysia, for example, apart from advances made by foreign enterprises there is little room for local companies to enter the sector. The situation concerning mechanical parts has much in common with die and mold manufacture mentioned later, but the issues at hand concern the achievement of more sophisticated machine design technology and precision processing technology.

Concerning plastic injection molding products and press forming products, a deep relationship exists between products and molds & dies. The quality of plastic injection molding products and press forming products depends on the quality of the molds and dies used to a degree of 90%. Incidentally, one thing that is common to both plastic injection molding products and press forming products is the fact that, even though companies are able to operate molding and pressing machines, they are unable to handle troubles that may occur. Technical levels can only be raised through operators becoming aware of problems and gaining work experience. However, the time required to raise technical levels can be shortened by providing short-term guidance by experts.

There are several local mold and die makers which are capable of dealing with molding and press forming products for domestic electrical appliances and automobiles, etc. However, the mold and die technology of even these companies cannot compare with that of foreign affiliates.

In this way, as is the case with plastic injection molding products and press forming products, the key technology is mold and die technology, and there is little difference in the final objective that was recommended at the time of the previous survey, i.e., to improve mold and die technology.

Since there are no specialist mold and die engineers who can be given guidance in Indonesia, it is considered best to carry out the following: in the short term, to utilize the systems of such overseas technical cooperation organizations as JODC, and to conduct guidance via foreign experts. In the medium to long term, raising the levels of companies should be achieved by developing engineers by means of the establishment of a technology center for mold and die making that was proposed in the previous study.

With respect to the components sector, since there exists fully developed manufacturers in Japan, Singapore and Malaysia, it will not be possible for Indonesian local companies to carry out large-scale plant investment straight away. It is wiser in the immediate future for local companies to supply to the domestic market as parts makers and semi-assemblers. While this happens, only those companies aiming to modify their manufacturing methods and raising their technology levels will survive.

Table-29 gives a summary of the problems and countermeasures that revolve around the issue of technology.

Table-29 Technical Problems and Countermeasures in the Local Electric Parts Industry

Classification	Problems	Counter measures
Parts	Delayed delivery Lack of design and precision processing technology Excessive dependence on imported parts	Dispatch of overseas technical experts Dispatch of production control experts Improvement of precision processing technology Improvement of production technology Invitation of foreign companies Simplification of customs clearance Reduction of import tariffs
Molding products and press forming products	Lack of injection molding technology Lack of press forming technology Lack of mold design technology Lack of production control technology Lack of problem solving capability Unstable supply of local materials	Improvement of basic technology Improvement of mold and die making (including CAD/CAM Systems) Dispatch of overseas technical experts Clarification of quality control regulations Introduction of factory visit instructors Establishment of domestic industrial standards Improvement of production technology Introduction of a skilled worker qualification system

Components	Lack of circuit design engineers Fluctuations in manufacturing processes Electromagnetic steel plate is imported Manufacturing processes are manual High dependence on imported parts and materials Old and obsolete production equipment Lack of technology to produce large size components Low level of measuring accuracy Unstable supply of local materials	Improvement of educational institutes Promotion of automated production Improvement of jigs, tools and devices Localization of special steel Improvement of acceptance quality control Financial support for equipment renewal Guidance by overseas experts Introduction of technology from foreign companies Invitation of foreign companies Development in the direction of a process industry Clarification of quality control regulations Improvement of molding technology Establishment of domestic industrial standards

2) Managerial Issues and Required Improvements

The managerial issues faced by companies in the electrical and electronic parts industry in Indonesia differ widely between local companies and foreign affiliate companies. Also, among local companies, differences can be seen in the problems facing large enterprises and small and medium enterprises.

Foreign affiliates tend to face fewer business problems, owing to the wide-ranging support that they receive from the parent companies. For example, while the currency/ economic crisis may have caused a reduction in domestic shipments, the parent company is often able to provide new markets, and to check the decrease in sales. Also, these companies rarely borrow from Indonesian financing organizations, but with the guarantee of the parent company, are able to borrow from foreign banks and therefore seldom suffer the effects of the credit crunch.

In the past, the biggest issue facing foreign subsidiaries was personnel, in particular, the securing of technicians and middle managers. This was largely due to labor shortages, caused by suddenly increased foreign investment, and by the limited staff training opportunities in Indonesia. However, once the currency/economic crisis caused employment opportunities to shrink rapidly, it became much easier to secure staff than it had been before. As unemployment figures rise, employees' incentive to stay with their company has grown stronger, and the once common job-hopping has now become very rare.

Even among indigenous companies, there are some large companies that have recently been introducing modern management techniques. However, small and medium sized companies still lag behind in terms of business management. These companies are being seriously affected by the currency/economic crisis and, in many cases, business has all but ground to a halt.

The main business problems facing mainly local small and medium sized businesses in the Indonesian electric and electronic parts and components industry, and strategies for improvement, are described below.

a. Modern business management techniques

Business management techniques range from business planning to marketing, sales, production, procurement, personnel and labor, finance and R&D, covering the whole spectrum of the management of an enterprise. Foreign affiliates benefit from comprehensive management support from their overseas parent companies, and so have few business management problems. In contrast, many of the local small to medium enterprises are family businesses and many of them are lacking in individual business management skills. There is little or no proper business planning, organizational planning or management control, and they face a great many business problems. As strategies for support, seminars to introduce business management techniques, sponsored by industrial associations and government bodies, and the invitation of experts from abroad to provide guidance to small and medium enterprises, would likely be very effective.

b. Entrepreneurial awareness

The majority of electrical and electronic parts and components manufacturers are small businesses, and depend, first and last, on orders from the assemblers. The result is that they tend to adopt a passive business style, abandoning any possibility of corporate development on their own initiative. Currently, the currency/economic crisis has caused

a drastic reduction in domestic demand in the electrical and electronic parts and components industries, and unless small and medium sized businesses have the entrepreneurial awareness to develop new markets for themselves, they will find it very difficult to survive. Therefore, the government and industrial associations need to take the lead in encouraging the provision of information on the market and technological trends, in planning study tours of model companies (benchmarking), or in dispatching experts who give individual guidance to businesses, etc.

c. Skilled labor force

In sectors such as precision processing and molds, etc., which support the electrical and electronic parts and components industry, there is a distinct paucity of skilled labor, particularly technicians. As a backdrop to this situation there is, first of all, a real lack of training organizations in Indonesia for the provision of technician training and, secondly, while there are universities and polytechnics that cover the sciences and do provide technical training, their focus tends primarily to be on theory, and apart from a handful of polytechnics, the acquisition of technical skill is neglected. Further, in the case of many small and medium companies, there is no system in place for the education and training of engineers and technicians, which hinders the development of technical and engineering skills. The educational institutions need to be vitalized into providing training not only for students, but for the improvement of the technical skills of technicians and engineers already in employment. In addition, it is vitally important that, in universities, polytechnics and in high schools, basic education be reinforced, along with the acquisition of technical skills, so that engineers are able to develop a basic scholastic ability. In the mid to long term, government research organizations and industrial associations will need to provide technical training centers that feature both practical skill training and academic study.

d. Information gathering

For small and medium sized businesses, information sources are limited to their trading partners, equipment suppliers, their own in-house experience, specialist publications and

magazines and seminars given by industry organizations, etc. Moreover, the information is often fragmentary and unsystematic. Also, the information is often one sided, and information that covers business in general and overseas markets is extremely limited. In addition to the provision of necessary information to small and medium sized businesses, there also need to be specialist guidance on how to obtain and utilize information. It is important that there be a smooth exchange of technical and business information among the assemblers and the small and medium sized businesses, and the industrial associations should take the lead in information gathering in each field. However, the Electrical and Electronics Industrial Association (GEI) and others are still at an underdeveloped stage, and need assistance from government and overseas organizations.

e. Support from the assemblers

In general, support from the assemblers to the parts and components manufacturers consists largely of technical troubleshooting for problems arising in quality control or manufacturing. There is no systematic support. Neither is there any support for non-technical matters, such as business management and finance. Only a very few companies receive routine assistance, and the majority of companies only receive assistance when a quality related or other technical problem arises. This situation begs for the development of systematic support strategies for the small and medium sized enterprises, on the part of assemblers. Such an initiative could take the form of cooperative associations comprised of parts and components manufacturers and led by the assemblers, or the development of specific industrial groups, focused from upstream industries to downstream industries. To achieve this, the government will need to take the initiative in reinforcing the linkage between the assemblers and parts and components manufacturers.

f. Support from public organizations and industrial associations

Polytechnics and universities, etc., hold short term programs and seminars, etc., for small and medium sized businesses. However, the content tends often to be limited to technical matters, and the lack of qualified experts and resources means that there is very little activity in the way of business management related subjects. Further, as the

industrial associations also lack resources, they have practically stopped providing support activities for small and medium sized businesses. There is a need for positive support activities for small and medium sized businesses, and this requires the urgent establishment of a powerful support system that encompasses both domestic and foreign government organizations. There are very few electrical and electronic parts manufacturers who make use of joint facilities such as UPT, etc. There is a need for measures to bring about the modernization of these facilities, and to ensure their effective and efficient utilization.

g. Financing

Against the backdrop of prolonged economic stagnation, there are practically no companies with plans for the construction of new factories, or increased investment in equipment, and there is very little demand for financing for plant and equipment investment. However, the soaring costs of raw materials, and declining sales, have led to more and more companies finding it difficult to finance day to day operating costs. Basically, most small and medium sized enterprises have very little extra funds to spare. Further, Indonesia's financial institutions have been left with huge amounts of bad debt, so that credit conditions for private sector firms have become very stringent, and it is extremely difficult to borrow from ordinary banks. Additionally, even if a loan is obtained, interest rates are a crippling 40 to 50%, making it very difficult to make sound investment and business plans. Meanwhile, the fact that the upper limits of financing for small to medium sized businesses through existing institutional financing schemes are so low, and that eligible companies are limited, means that the demand for funding is not being fully met. In this situation, there needs to be urgent implementation of institutional financing schemes that matches the actual conditions of the small and medium sized enterprises.

Table-30 provides a summary of improvement strategies that are required in order to address the business management problems outlined above.

Table-30 Improvement Measures for the Managerial Issues Faced by the Local Electric and Electronic Parts Industry

Area	Problems	Suggested Measures
Business management techniques	• Family businesses • Lack of business management systems	• Business management seminars sponsored by industry organizations • Peripatetic instruction by foreign specialists
Entrepreneurial awareness	• Passive business management style based on production on orders received.	• Provision of information by government and industry associations • Study tours of model businesses (benchmarking) • Individual specialist instruction for businesses
Skilled workforce	• Lack of technicians • Lack of basic education	• Vitalization of educational institutions • Fuller and more complete basic education • Establishment of technical training centers, etc.
Information gathering	• Lack of business management information • Lack of market information	• Stronger linkage between assemblers and parts and components manufacturers • Support for industry associations from government and overseas organizations
Support from assemblers	• Lack of support in the area of business management • Lack of systematic support	• Stronger linkage between assemblers and parts and components manufacturers • Promotion of cooperative associations • Development of industrial sites for particular fields
Support from public institutions and industry associations	• Lack of support in the area of business management • Lack of resources	• Establishment of a support system by domestic and foreign government bodies • Effective utilization of UPT and other existing facilities
Funding	• Lack of operating capital • Credit crunch and soaring interest rates	• Fuller and more complete institutional financing

(5) Macro Framework for the Development of Electric and Electronic Parts Industry

1) Priority Parts and Components

In the previous study, the three aspects of a) economic impact, b) technological impact and c) overall competitiveness (ease of market access and overall competitiveness viewed from product competitiveness, etc.) were used to select product groups of parts and components

whose development was to be considered a priority. These parts and components are listed in Table-31. Further, as examples of parts and components to be accorded priority second only to this group, the selection also includes flexible PCBs, liquid crystals (monochrome/ color), micro-speakers, button switches and sensors, etc.

Table-31 Parts Selected for Prioritization in the Previous Study

Category	Priority Parts and Components
Mechanical Parts and Components	Plastic frames, Injection molded parts, Metallic press machined parts, Machined parts
Electric Parts and Components	Single/double sided PCBs, Multi-layered PCBs, Induction motors, DC motors, Audio speakers, Power supply unit connectors, Low voltage/micro current connectors
Electronic Parts and Components	Resistors, Capacitors, Semiconductors

All of these priority parts and components are basically mass production products that can be targeted at the overseas market, for which the multinational enterprises have both the manufacturing know how and the sales channels. Production of some of these parts and components has already begun in Indonesia, but as the fundamental technology is lacking, there are practically no multinational enterprises that will subcontract to local firms. In the future, in order to develop the supporting industries, either through obtaining subcontracting work for electric and electronic parts and components from multinational firms, or by attracting new overseas parts and components companies, it is essential that basic technological skills in local firms be improved.

In order to be able to manufacture the types of parts and components that have been selected for prioritization, the following fundamental technologies are required: press technology (simple press work, and plate press work), plastic molding technology (general purpose injection molding, and insert molding), machining technology, mold technology (simple press molds, plate press molds, and general purpose plastic molding molds) and heat treatment technology.

In general, for electric and electronic parts and components, plastic molded parts and metal

pressed parts are widely used, but cast and forged parts are few. Also, with regard to electric and electronic products, by far the majority is plastic molded parts and metal press parts. For example, TVs, audio systems and PCs, etc., are examples of household electronic goods. It is expected that there will be a surge in the demand for plastic molded and metal press parts and components for these goods in the future.

From the above, it can be seen that plastic injection molding technology and press working technology are some of the most vitally and urgently needed fundamental technologies. At the center of these technologies is manufacturing technology for precision presses and plastic molds. Currently, fairly simple molds can be manufactured domestically, but the more complex molds that are required for the manufacture of electric and electronic parts and components are still supplied from abroad. Therefore, in order to develop the supporting industries of the electric and electronic industries in Indonesia, it is necessary that the technology required to manufacture complex molds be learned. In addition to mold manufacturing technology, maintenance technology for the manufactured molds, and plastic molding technology, are also required.

2) Direction for the Development of the Electric and Electronic Parts Industry

To sum up, the short term and medium to long term development targets or support measures needed to promote the electric and electronic parts industry in Indonesia can be summarized as follows.

a. Concerning mechanical parts, plastic injection molding products and press forming products, it is necessary to raise levels of injection molding technology and press forming technology. With respect to plastic injection molding products and press forming products, unless the industry possesses firm mold and die technology (key technology), it will merely become a subcontracting sector rather than a supporting industry. The support of overseas expert engineers is essential for developing mold and die technology. It is necessary, in the short term, to rise levels through having experts provide technical guidance. In the medium to long term, it is required to build a system for intensively developing engineers through establishing a technology center

for die and mold making equipped with high performance equipment and highly skilled experts.

b. With respect to electronic microchips, since a setup for supply from Singapore and Malaysia, for example is already in place, they should make a positive effort to attract this supply industry rather than Indonesian companies entering that market. For local companies which are currently in difficulty as a result of appreciation of the dollar and the burden of import tariffs, it is necessary that support measures be taken with a view to reduce costs by lowering or abolishing tariffs.

c. A weakness that is pointed out as common to all parts manufacturing process in Indonesia concerns production technology in the areas of production control and quality control, etc. The reason for this is that there are few engineers who know whole production lines and few supervisors who can oversee production processes. Although it takes time to foster such human resources, it is important to give personnel practical experience through gaining the cooperation of assemblers and dispatching staff for overseas training. In the future, it may be possible to establish a production technology center, or other facilities. capable of conducting training in Indonesia, too. It is also recommended that a company internship system be established whereby future personnel can gain workplace experience while they are still students.

d. In addition to the above problem, another weakness in industrial production concerns the shortage of human resources capable of carrying out trouble shooting. For the time being, it will be necessary to develop problem solving capability through utilizing experts and having staff learn from case studies. However, in the long term it will be necessary to systematically disseminate knowledge and experience at the aforementioned technology center for mold and die making and the production technology center. Another possible measure is to encourage self-improvement through establishing a qualification system for engineers and skilled workers, i.e., a system for assessing technology levels of workers.

e. With respect to components, as was mentioned above, it will be necessary to rely on

imports or purchases from foreign affiliated companies regarding electronic microchips. However, if there is a possibility of competing with foreign affiliated companies, it would be good to move towards establishing automated production facilities in the future. If no such prospects exist, local companies should limit their activities to supplying cheap PCBs, motors, transformers and assembly products to local assemblers, and.improve and modify their existing production methods

f. The above-mentioned items of marketing, information, financial support and human resources development are important issues for small and medium enterprises. However, for companies that can make good quality products (a major prerequisite) but have been unable to establish sales routes and connection and have weak marketing capability, governmental backups including strengthening of industrial associations' activities are especially required. Concerning information provision and support of business negotiations, etc., it would be a good idea to strengthen NAFED and develop this into a more powerful trade organization. With respect to the support activities in such fields as the provision of technical advice, investment and financing advice (including loan and subsidy schemes) and other related information, etc., the establishment of an organization which integrate all of the supporting industry development measures will be effective. Concerning human resources development, the first step development should consider receiving cooperation from foreign affiliated companies, strengthening the functions of government agencies (UPT, etc.) and utilizing regional polytechnics, and in the long run it will be necessary to establish the aforementioned technology center for mold and die making and the production technology center.

Table-32 Technical Development Measures for Electric and Electronic Industry

Items		Issues of Present Situation	Short Term Measures	Medium and Long Term Measures
Parts	Mechanical Parts	a) Delayed delivery of imported standard parts b) Lack of design technology c) Lack of production and processing technology	a) Simplification of customs clearance b, c) Dispatch of experts; Strengthening of links with assemblers	a) Abolition of import tariffs b, c) Establishment of a production technology center
	Electronic Parts	a) High dependence on imports	a) Lowering of import tariffs	a) Abolition of tariffs; Invitation of foreign parts manufacturers
Molding & Press Forming Products	Plastic Moldings & Molds	a) Lack of injection molding technology b) Lack of mold fabrication technology capability c) Lack of production control technology capability d) Shortage of managers with knowledge of lines e) Lack of problem solving capability f) Unstable supply of local raw materials	a, b, c) Dispatch of experts d) Overseas training of supervisors e) Education of basic skills of mold engineers f) Clarification of quality control regulations	a, b, c) Establishment of a technology center for production, and mold and die making; Introduction of factory visit instructors d) Company internship system for students e) Introduction of a skilled worker qualification system f) Establishment of domestic industrial standards
	Press Forming & Dies	a) Lack of press forming technology b) Lack of die fabrication technology capability c) Lack of production control technology d) Shortage of managers with knowledge of lines e) Lack of problem solving capability	a, b, c) Dispatch of experts; Strengthening of links with assemblers d) Overseas training of supervisors e) Raising of basic skills of mold engineers	a, b, c) Establishment of a technology center for production, and mold and die making; Introduction of factory visit instructors d) Company internship system for students e) Introduction of a skilled worker qualification system
Components	P C B s	a) Lack of circuit design engineers	a) Tie-ups with electronics polytechnics (R&D cooperation)	a) Utilization of company personnel training courses at educational institutes
	Transformers	a) Electromagnetic steel plate is imported b) Manufacturing processes are manual	a) (-) b) Improvement of jigs, tools and devices	a) Localization of special steel b) Promotion of automated production
	Motors	a) Raw materials are imported b) Old and obsolete equipment c) Large motors cannot be manufactured	a) Acceptance quality control setups b) Financial support measures for equipment renewal c) Dispatch of experts	a) Localization of special steel production b) Promotion of automated production c) Introduction of technology from foreign companies
	Semi-assembling Products	a) Many basic parts are imported b) Much assembling work is done manually c) Poor measurement of cabinet dimensions d) Unstable local plastic raw materials	a) (-) b) Improvement of jigs, tools and device c) Development of the technology of subcontracted press forming makers d) Clarification of quality control regulations	a) Invitation of foreign companies b) Promotion of automated production c) Establishment of a technology center for mold and die making d) Establishment of domestic industrial standards

Source : JICA Study Team

Table-33 Managerial Development Measures for Electric and Electronic Industry

Items	Issues of Present Situation	Short Term Measures	Medium and Long Term Measures
Marketing	a) Lack of marketing capability / Slow response b) Difficulty in entering overseas markets c) No measures to access foreign buyers	a) Marketing and retailing education b, c) Advertisements in overseas industry publications; Strengthening of the functions of NAFED; Cooperation and effective utilization of MOIT	a) Widespread staging of trade fairs in Asia b, c) Establishment of an external trade organization; Major upgrading of production technology (good products will sell)
Information	a) Lack of industry and technology information	a) Support measures and function bolstering measures for the industrial association and related bodies	a) Establishment of a small and medium enterprises agency a, b) Establishment of an Information and technology advice center
Loans and Funds	a) Difficulty in borrowing from banks b) Lack of funds for equipment renewal c) Lack of working capital	a, b, c) Expanded utilization of two-step loans; Emergency government support measures	a, b) Establishment of a small and medium enterprises agency
Human Resources & Training	a) Only OJT is available b) Lack of literature and textbooks on technology	a) Utilization of polytechnics, etc. b) Expansion in function of the industrial association	a, b) Establishment of a production technology center; Strengthening of function of the UPT; Cooperation with foreign companies

Source : JICA Study Team

Ⅲ. OVERALL DEVELOPMENT STRATEGIES

3.1. BASIC POLICIES AND APPROACH

(1) Basic Policies

It is recommended that the development of the supporting industries be promoted on the basis of the following policies:

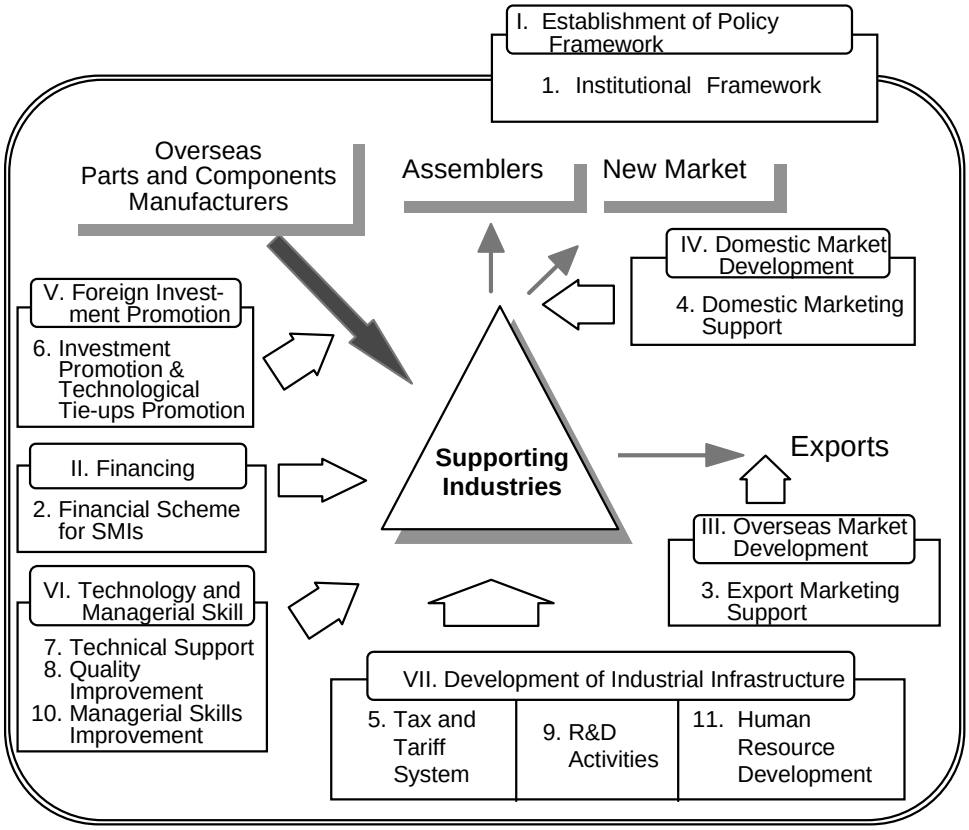
i. The development of the supporting industries will be promoted from two perspectives. The first one is short-term measures to ease the current difficulties of the supporting industries. The second is medium and long-term measures to realize the international competitiveness of the supporting industries in the era of trade liberalization under AFTA.
ii. The development will be effectively promoted by taking an integrated approach towards identified development targets, with the purpose of developing strong parts and components manufacturers instead of protecting small scale enterprises. From this viewpoint, supportive measures will be targeted to the supporting industries which have potential to be internationally competitive in the regional market.
iii. The reduction in dependence on imported parts and components and expansion of exports of parts and components will be pursued through the improvement of management and technological capabilities of the supporting industries.
iv. The linkage between assemblers and the supporting industries will be widened by promoting the development of potential suppliers.
v. The development will emphasize the market mechanism to build competitive industries.
vi. The development will make use of supportive activities by the private sector, especially those of assemblers.

(2) Development Approaches

The following 11 action measures from 7 areas are proposed as basic development approaches for the development of supporting industries in Indonesia:

(1) To establish a policy framework for the development of the supporting industries and an organization for effective implementation.
(2) To expand loans for the supporting industries.
(3) To support overseas marketing activities of the supporting industries.
(4) To support domestic marketing activities of the supporting industries.
(5) To rationalize tax and tariff systems.
(6) To promote foreign direct investments and technological tie-ups.
(7) To support the improvement of the technological level of the supporting industries
(8) To improve the quality level of the supporting industries.
(9) To expand the support for R&D activities of the supporting industries.
(10)To support the improvement of managerial skills of the supporting industries.
(11)To expand human resource development.

Fig. 10 Basic Approaches for the Development of the Supporting Industries



3.2. CONTENTS OF OVERALL DEVELOPMENT MEASURES

Institutional Policy Framework

Measure 1: Preparation of an Institutional Framework

1) Problems Regarding the Institutional Framework and Policy Mechanism

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

i. The on-going emergency programs are only targeted to the small scale industries, which are in a difficult condition due to the economic crisis.
ii. Policies and measures for the development of medium scale industries are still lacking in the government's SMIs policies.
iii. The SMIs policies are subject to the restraint that they have to cover a large number of companies located all over the vast country within the limited budgets.
iv. A further integrated approach is required for the development of the supporting industries.
v. Coordination and cooperation with other related ministries is now insufficient for the effective development of SMIs.

2) Recommendations

Short-term Measures

i. A category of medium scale industries defined as below should be introduced, and the target companies of SMI policies be shifted upward.

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 of Rp. 5 billion or less
Large Scale Industries:	Total assets over Rp. 5 billion.

ii. The scope of small scale industries development measures will be extended to the

medium scale industries and some new measures will be introduced responding to the features and needs of the medium scale industries.

iii. "One-stop service center," general contact desk for government's services for the supporting industries, should be established under the Directorate General for the Small Industry and Trade. This will 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

iv. The government services to SMIs by related ministries and organizations should be coordinated to make these services more efficient.

Long-term Measures

v. The directorate will handle the medium scale industry including the supporting industries as well as the small scale industry. In the long run, the directorate 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

vi. To establish harmony with international business rules and with society

Financial Support

Measure 2: Expansion of Finance to Small and Medium Industries

1) Problems Regarding Finance for the Supporting Industries

Major problems of the supporting industries are a shortage of working capital, limited availability of trade financing, and high interest rates. As major problems when the supporting industries raise funds, the following are pointed out:

Problems on the borrower side

i. They can not offer appropriate collateral for bank loans because their assets are limited.
ii. They can not prepare a loan application form for special loan schemes for the small industries because they lack knowledge of these schemes and the procedures are complicated.
iii. They can not prepare a feasible project because they lack the project formation capability and they are not accustomed to application procedures.
iv. There often is an eligibility problem due to a drop in sales and their poor management capabilities.

Problems on the lender side

i. Commercial banks are very reluctant to provide new loans because they are required to improve their capital adequacy ratio (CAR) under the on-going recapitalization program and they do not want to increase risk assets.
ii. Commercial banks suffer from negative spread between deposit and lending rates because of the soaring interest rates of deposits.
iii. Credit handling cost is high because amounts of credits to small scale industries are small.
iv. Credits to SMIs are high risk and it is difficult to find viable borrowers and feasible projects.

2) Recommendations

Short-term Measures

i. To realize a credit guarantee scheme for L/C opening: The Government announced

that it would introduce a credit guarantee scheme for L/C opening by PT. ASKRINDO. However, the guidelines of the scheme have not yet been announced. This scheme should be realized as soon as possible to encourage commercial banks' import financing.

ii. The government plans to set up a commercial bank specializing in trade financing by reforming a commercial bank taken over by the Government. This plan should be promoted to expand trade financing for the Indonesian industry, including the supporting industry.

iii. It is necessary to introduce a loan scheme which aims to provide loans to the medium scale industries which are not covered by the social-safety-net loan schemes. One of the options is to introduce such scheme as a two-step loan funded by overseas sources.

iv. To expand technical assistance to SMIs in preparing loan proposals.

Long-term Measures

v. A financial institution specializing in finance for the small and medium scale industries should be established. This institution will provide low-interest long- and medium-term loans for capital investments, including expenses for technical assistance. This institution will have a sufficient number of loan officers specialized in loans for SMIs for a quick flow of funds, better project finding, and reduced credit risks.

Marketing

Measure 3: Support for Export Marketing

1) Problems Regarding Export Marketing

Major problems concerning export marketing for the supporting industries are as follows:

Short Term Problems

i. Disorder of trade financing mechanism

ii. Drop in order receipts due to Indonesia's political and social unrest

iii. Complicated and unclear export procedures

iv. Time-consuming procedures for the custom duty draw back system
v. Lack of tax incentives for indirect exports

Medium and Long Term Problems

vi. NAFED's insufficient capability in export promotion
vii. Low quality of Indonesian products for export
viii. Poor trade-related infrastructure

2) Recommendations

Short-term Measures

i. To review the existing tax system concerning trade and export promotion: This includes the introduction of tax incentives for indirect export and computerization for quicker processing of taxation.
ii. The regulations on cargo handling should be clearer and the related handling charges including VAT on port services should be lifted or reduced.
iii. To exempt the fiscal tax for export promotion purpose trips
iv. To introduce trade financing schemes in order to correct the current disorder of trade finance in Indonesia
v. To encourage exports by foreign-invested assemblers and parts and components manufacturers
vi. To expand and make effective NAFED's export promotion activities
vii. To expand public organizations' support for overseas marketing activities
viii. To provide information services on overseas markets by public organizations
ix. To provide guidance on export marketing to SMEs
x. To expand training on export marketing
xi. To hold parts & components procurement trade fairs (reverse trade fairs)

Medium and Long-term Measures

xii. Such activities of NAFED as business matching services, information services, overseas promotion, etc., should be continuously expanded. For this target, personnel training from the long-term point of view should be instituted.

xiii. The development of sea transportation companies is also important for the competitiveness of Indonesian industries. It is also necessary to expand the forwarding industry that performs customs clearance, packing, storing, and transporting work for better cargo handling.
xiv. To upgrade the quality of Indonesian products
xv. To increase the cost competitiveness of Indonesian products

Measure 4: Support for Domestic Marketing

1) Problems Regarding Domestic Marketing

The local supporting industries are in dire need of finding new customers in the different industries because their market has sharply shrunk due to the economic crisis. Major bottlenecks of local parts and components manufacturers in diversifying their businesses are insufficient marketing capability, lack of information on potential customers, and insufficient new customer development activities. Support for subcontractors in finding new customers, by providing necessary information and mediating businesses, is necessary.

2) Recommendations

Short-term Measures

i. The following marketing support 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 provide information on buyers' wants for parts and components purchase
ii. To hold parts & components procurement trade fairs (reverse trade fairs)
iii. Preparation of a database on parts and components manufacturers
iv. Expansion of activities to mediate between suppliers and buyers of parts and components

Medium and Long-term Measures

v. To provide support for product diversification by the supporting industries

Measure 5: Rationalization of Tax and Tariff Systems

1) Problems of Tax and Tariff Systems

Luxury taxes are one of the problems in expanding the domestic market. These high luxury taxes restrain the growth of the domestic market for electric home appliances. This limits the size of the parts and components industries as well. Under the current situation, it is necessary to reduce luxury taxes to encourage domestic consumption.

2) Recommendations

Short-term Measures

i. Luxury taxes shall be reexamined from the viewpoints of stimulating domestic consumption as well as realizing sound development of the industries.
ii. To secure an accord between industrial policy and the tariff system: According to the agreement with the WTO, the government is reviewing the current import tariffs on automotive parts and components. For other industries, it is necessary to pay adequate consideration to the accordance between industrial policy and the tariff system.

Investment Promotion

Measure 6: Expansion of Investment Promotion Activities

1) Present Problems Regarding Investment Promotion

The major competitive parts and components manufacturers are foreign-invested companies. They are essential to a higher level of competitiveness and the value added of Indonesian machinery, automotive, and electrical and electronic industries. From this aspect, it is necessary to encourage foreign direct investment in the supporting industries. However, the

deterioration of business environments in the ASEAN region and the political instability in Indonesia have drastically decreased foreign direct investments into Indonesia. At the same time, many local parts and component manufacturers need capital participation by foreign investors in order to solve their financial difficulty as well as to receive technical assistance. However, foreign companies are taking a wait-and-see attitude until the Indonesian political situation is settled.

2) Recommendations

Short-term Measures

i. 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 companies by preparing a database of this information. At the same time, the services of mediating foreign companies and local companies will be expanded.
ii. 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.
iii. For the promotion of investments by foreign 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.

Medium and Long-term Measures

iv. 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 Asian region.

Technical Support/ R&D Capability Improvement

Measure 7: Improvement of Technological Level of the Supporting Industries

1) Problems Regarding Technological Level

The upgrading of the technological level of production is necessary to increase parts and components exports to the Asian region and/or advanced countries because the level of quality, cost, and delivery (QCD) of local manufacturers does not satisfy the requirements of foreign customers.

Production-related technologies can be largely divided into two categories: technologies specific to products, and production management technologies. The former are technologies related to the technological level of product, such as R&D, production process and production equipment, and the latter are the technologies related to QCD (quality, cost and delivery), such as production control, quality control, physical distribution, and labor management. The improvement of specific technologies should be promoted through the modernization of facilities and equipment, and the introduction of the latest production processes. Technical tie-ups, studies on latest technologies, and the expansion of R&D capabilities are major methods of upgrading specific technologies. As for production management technologies, continuous and steady efforts for improvement, upon managers' recognition of their importance, are necessary. Technical guidance by assemblers, public institutions, and specialists are effective methods of improving production management technologies.

2) Recommendations

Short-term Measures

i. Assistance by assemblers to local vendors should be expanded with the purpose of upgrading the products of local vendors to the level of requirements of overseas users, which is essential for parts and components exports. Assemblers are promoting the development of local subcontractors. Some of them have formulated an integrated program for subcontractor development, including technical guidance. These efforts should be further encouraged.
ii. The improvement of production technologies which can be done in the short term should be conducted with the assistance of foreign experts and/or local public institutions. Improvement in production technologies, jigs & fixtures, production management,

inspection system, delivery control , etc., will be carried out.

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

iv. Upgrading of public technical support centers in the region

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

vi. 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

Medium and Long-term Measures

vii. At local areas, the services of local R&D institutions and UPTs should be modernized and upgraded. It is necessary to reinforce central R&D institutions so that they can support the expansion of local R&D institutions' capabilities. More UPTs should be also upgraded. The linkage between R&D institutions and UPTs should be strengthened to improve the technical assistance to the supporting industries.

viii. Technological tie-ups between foreign licensers and Indonesian parts and components manufacturers will be promoted and assisted by the Indonesian government and assemblers to start the production of parts and components which are not currently produced.

Measure 8: Improvement of Quality Level

1) Problems Regarding Quality Level

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: a) both top management and workers have insufficient recognition of the importance of quality; b) knowledge of quality control methods is insufficient; and c) there are insufficient personnel who can take care of quality control.

2) Recommendations

Short-term Measures

i. Promotion of technical guidance by assemblers to their subcontractors
ii. Improvement of quality control with the assistance of experts: Local parts and components manufacturers should be encouraged to accept foreign experts to improve their quality level as well as production technologies.
iii. A quality control system which is appropriate for SMIs should be developed and diffused to SMIs.
iv. 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.
v. Preparation of Indonesian industrial standards

Medium and Long-term Measures

vi. 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 that an institution be set up which carries out research on quality control and spreads systematically and continuously the outcome to companies in the country.

vii. 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.

Measure 9: 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 a low technological level and it is hard for them to make new products based on their original technologies or to export their products. This situation is due to their insufficient R&D capabilities in terms of business size, facilities, technological level, and personnel.

2) Recommendations

Short-term Measures

i. It is necessary to provide information on products, market needs, technical requirement, necessary technologies, etc., to support local parts and components manufacturers' product diversification to the different industries.

ii. Such governmental incentives as tax incentives and subsidies are necessary to support private sector R&D activities to diversify their products for new markets. Tax incentives for R&D have already been introduced. However, it is pointed out that these do 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 ideas but need such support.

iii. Promotion of the localization of the function of authorizing new parts and components at assemblers

iv. Promotion of the transfer of foreign-invested assemblers' product designs and development processes to Indonesia

v. Expansion of facilities of R&D support institutions under MOIT

Medium and Long-term Measures

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

vii. 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 and association among engineers in private companies, public institutions, and universities.
- To accumulate experienced personnel through joint R&D activities.

Management Skills

Measure 10: Improvement of Managerial Skills of SMIs

1) Problems Regarding Management Skills

The followings are pointed out as the major problems in management of SMIs in Indonesia: a) the lack of modern management skills at the small and medium scale industries; b) management skills are not developed enough to promote exports and raise new funds; and c) the supporting industry should improve their management skill to modernize their management.

2) Recommendations

Short-term Measures

i. It is necessary to upgrade the existing training programs on managerial skills and extend them to the SMIs, focusing on marketing, export promotion, financing, and product diversification. Program development will be carried out by PUSBINLAT, PPEI and other related organizations. Programs will be made more practical to meet the needs of SMIs.
ii. The consulting skills of extension workers should be upgraded for the improvement of management and technological level of SMIs
iii. This will be achieved through the expansion of activities of extension workers, and the modernization of UPTs.

Medium and Long-term Measures

iv. To establish an SMI consultant system in MOIT: The system of bringing up management advisors should be established. They should conduct management diagnosis of SMIs, and based on the results, continuously give management advice on appropriate business planning and improvements in management.
v. The function of SMI guidance by MOIT should be expanded. This includes the preparation of a database, information service, and researches on SMIs.

Human Resource Development

Measure 11: Expansion of Human Resource Development

1) Present Problems Regarding Human Resource Development

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. 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.

2) Recommendations

Short-term Measures

i. 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 for the establishment of training institutions by private companies.

ii. There are various types of schemes for training within the country and overseas funded by foreign countries and organizations. The use of these schemes should be encouraged to upgrade the level of employees.

iii. Development of training programs for high need technologies: 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 high need subjects, the training system including curriculum, equipment, and the level of instructors should be enriched by such organizations as CHEVEST.

Medium and Long-term Measures

iv. 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. Through these kinds of efforts, it is necessary to expand the vocational training system flexibly responding to these needs.

v. 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.

vi. 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.

vii. The following should be promoted to develop engineers and technicians with engineering knowledge:
   - Expansion and enrichment of engineering education at universities
   - Expansion of polytechnics
   - Introduction of training programs for technician level personnel working at companies

Ⅳ. ACTION PROGRAMS

4.1. SELECTION OF ACTION PROGRAMS

In the studies of the machinery parts, automotive parts and electrical and electronic parts sectors, various problems currently being faced by the supporting industries in Indonesia were identified, and possible countermeasures to these problems were investigated. Further, having synthesized the results of the investigations in each sector, recommendations were made for overall strategies for the development of the supporting industries.

These overall strategies are all vitally important, and work should begin on them as soon as possible. However, due to restraints on human resources and finances, it will be difficult to begin implementation of all of them at once. Therefore, after consideration of the following conditions, 1) the degree of urgency from the perspective of the majority of supporting industry companies which are facing business management difficulties due to the sudden decrease in demand, 2) measures which do not necessarily require major personnel or financial investments, such as import duty system reviews and the relaxing of regulations, etc., to be set aside, and 3) measures that have the possibility of receiving assistance from international aid organizations and of moving comparatively quickly to implementation, and which address the current most pressing problems, several hypothetical action programs were proposed, and the level of priority and feasibility of each investigated. Through this process, the following five action programs were recommended.

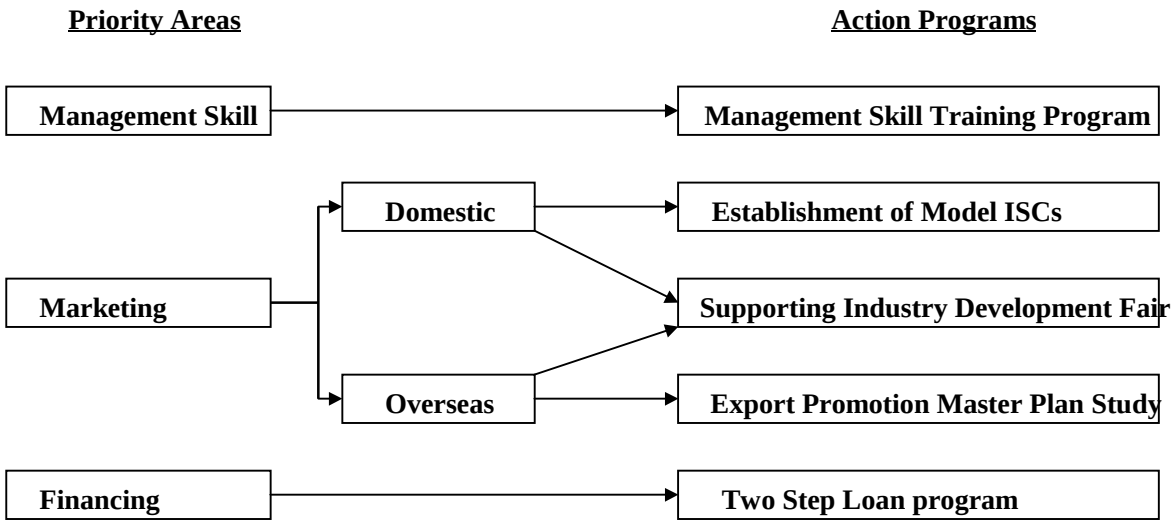
1) Development Study for the Establishment of an Export Promotion Master Plan.
2) Project for the Establishment of Model Industrial Service Centers (ISCs)
3) Supporting Industry Development Fairs
4) Expansion of Management Skill Development Program for Small and Medium Industries
5) Supporting Industry and Export Oriented Small and Medium Industries International Competitiveness Strengthening Program - Two Step Loan (TSL)

The major factors considered in the selection of the action programs were as follows.

a. The majority of businesses in Indonesia's supporting industries are facing business difficulties as a result of the sudden drop in demand, following the economic crisis. The greatest requirement is for assistance in marketing.
b. The supporting industry's main target market are the domestic assemblers, but there is a very large information gap between the supporting industry companies and the assemblers. There is a need for programs that provide the assemblers with information about potential domestic parts and components suppliers, and the supporting industries with information about the kinds of products for which assemblers want domestic supply.
c. Under the current economic crisis, domestic demand is expected to take some time to recover. The development of new markets abroad has become a pressing matter for the supporting industries also. For businesses that have previously had little experience in exporting, there is a need for programs that will introduce them to potential customers overseas. Also, until now, support from Indonesia's public organizations has concentrated on the export of consumer goods, and there is an obvious problem with their ability to provide support for exports of the kinds of industrial products that are manufactured by the supporting industries. A master plan for the promotion of exports overall needs to be decided upon, and within that, the positioning of support strategies for industrial products made clear.
d. Until now, businesses in the supporting industries have been engaged in subcontract production, but if they are to expand their domestic sales channels and to open up new markets overseas, they will need to develop their awareness as operators of their own businesses. It is vital that steps be taken to raise business operators' levels of awareness, and to further develop training programs for the improvement of management skills.
e. Even if businesses in the supporting industries do develop new markets overseas, under the current financial situation, they will face very serious financial restraints in their attempts to purchase the machinery and equipment necessary to produce the required products, and to procure raw materials. There needs to be a program to provide mid to long term financing to businesses with overseas and domestic customers.

f. Given the current fragility of the Indonesian supporting industries, assistance in marketing only or in management skills only or in financing only cannot be expected to bring satisfactory results. The priority must be on the development of comprehensive support programs that encompass marketing, management and technical skills and finance.

Fig. -11 Selection of Action Programs



4.2. CONTENTS OF THE PROPOSED ACTION PROGRAMS

(1) Establishment of Export Promotion Master Plan

1) Objective

To conduct a simulation of the kinds of structural division of labor that will develop in the region, after the formation of the ASEAN Free Trade Area (AFTA), after the target year 2002, and to formulate an export promotion master plan for Indonesia. Further, specific measures for the realization of this master plan will be drawn together into an action plan.

2) Details of the "Master Plan Study"

a. Analyze Indonesia's export structure, the export competitive strength of her main industries, export promotion organization, export promotion policies, etc.
b. After having made a comparison between the export structures of the ASEAN nations, their export competitive strength, export promotion policies, etc., and those of Indonesia, conduct a simulation analysis of the division of labor structures that are likely to develop in the ASEAN region, after the formation of AFTA, and formulate a hypothesis as to the best export structure for Indonesia to adopt.
c. Formulate a master plan for the eradication of bottlenecks from Indonesia's current export promotion activities, and for the advancement of the competitive strength of strategic industries.
d. Draw up an action plan for the realization of the above master plan, in a format that relates to the master plan.

3) Agencies Involved in the Implementation

The work of formulating the master plan will be undertaken by the Ministry of Industry and Trade's National Agency For Export Development (NAFED) and the Directorate General for Overseas Trade, the Directorate General for International Industry and Trade Institutional Cooperation and other agencies involved in export promotion. Also, the cooperation of the

International Technical Cooperation Agency will be requested, as they have considerable experience in the formulation of such national export promotion policies.

(2) Establishment of Model Industrial Service Centers (ISCs)

1) Objective

Areas with a high concentration of metal processing work firms are potential bases for the supporting industries, and it is in these areas that model Industrial Service Centers will be set up, and the capabilities of the CSFs expanded.

Specifically, two or three out of the existing CSFs will be selected, and the assistance of international cooperation agencies requested in furnishing the centers with modern machinery and equipment, and the introduction of the latest technologies. At the same time, the CSFs will be reorganized so that they are capable of functioning as comprehensive business centers, providing not only technical assistance, but management and marketing guidance as well.

Also, in the long term, using the experience gained in the model centers as a foundation, all existing CSFs will be restructured into profitable, self sufficient business center organizations, capable of providing firms in their areas with marketing information, as well as the introduction of technology needed to expand sales, and the technical and business guidance necessary for the improvement of competitive strength.

2) Target Areas for the Establishment of Model Centers

From among metal working related CSFs that are situated in the areas where small and medium metal working businesses are concentrated, two or three sites will be selected for the establishment of model centers.

3) Details of Activities of Model ISCs

The activities that the model ISCs are expected to be involved in are as follows.

1) Gathering of corporate information in the target areas.

The construction of a corporate data base for the verification of business management guidance and technical guidance needs, and for business mediation activities.

2) Providing businesses in the area with machinery and equipment for shared use.

   Replacement of press mold, sheet metal processing and machining equipment in order to enable the manufacture of the jigs and tools required for the improvement of technical levels in metal working.

3) Encouraging the use of the latest technology among the local enterprises.

   Main technological topics will be a) improvement of general purpose press mold technology - better mold precision leads to higher product added value, and helps in securing orders, b) improvement in machining technology for cast products and die-cast products - leading to the improvement of product added value of companies manufacturing these products, and c) improvement of press technology - enabling production of parts and components with a higher level of precision than at present, and allowing companies to respond to multiple item and small volume production needs, etc. Judging from the current activities of the local companies, press work and parts machining will probably be the main focus. Therefore, the order of priority is likely to be a), b), and c).

4) Business management guidance for companies in the target areas

   Providing company executives with business management guidance, marketing guidance and market and other business information.

(3) Supporting Industry Development Fair

1) Objective

In the major cities in Indonesia, “Supporting Industry Development Fairs” will be held in order to gather together large domestic and foreign companies and local small and medium sized companies with the potential to become sub-contractees, with the aim of strengthening communication between the two sides, and promoting sub-contracting deals.
By holding these fairs every year on a regular basis, information on related companies can be gathered and used to construct a data base.

2) Specific Details of the “Supporting Industry Development Fair”

a. The kinds of parts and components that large companies in the automotive, electric and electronics and industrial machinery sectors, which assemble products and their major parts and components in Indonesia, are hoping to be able to supply from within Indonesia or the ASEAN region, will be displayed, in an effort to try to identify companies with the potential to become suppliers. As far as possible, large companies from Japan and other ASEAN nations will be invited to participate in the fair.
b. Small and medium sized companies that are producing parts and components for the automotive, electric and electronics and industrial machinery sectors, or who would like to be involved in that business, will display the kinds of products that they are capable of producing, in an effort to identify potential customer firms. As far as possible, small and medium sized companies from Japan and other ASEAN nations will be invited to participate in the fair.
c. In parallel with the fair, there will be seminars at which the representatives of large companies will be able to explain their companies’ parts procurement strategies, and where experienced engineers will be able to talk about the kinds of technical information required in order to be able to enter the parts and components market.

3) Organizations Involved

Organizations involved in the implementation of the fairs include departments concerned with the development of the supporting industries, such as the Ministry of Industry and Trade's Directorate General for Small Scale Industry and Small Scale Trade, and the Directorate General for Metal, Machinery, Electronics and Multifarious Industries, as well as Indonesia's National Agency For Export Development (NAFED), GAIKINDO (Association of Indonesian Car Manufacturers), GEI (Association of Electronics and Electrical Home Appliances Industries of Indonesia), GIAMM (Association of Indonesian Automotive Parts Manufacturers), GAMMA (Federation of Indonesian Metalworks and Machinery Industries), and other related industrial groups.

In addition, international trade promotion organizations with experience in running these kinds of fairs, and that are able to invite foreign firms to attend, will be called upon for their cooperation.

(4) Management Skill Development Program

A. Extension Workers (TPPs) Revitalization Program

1) Objective

The objective of this sub-program is to set up the management system of Industrial Research Workers (TPPs), upgrade the capability of TPPs, and expand consulting services to small and medium scale enterprises.

2) Content of the Program

The management system of TPPs will be set up and the master plan for the development of TPPs be formulated, for which the following tasks will be carried out:

① Identification of the needs of small and medium scale enterprises to guidance and consultancy services from TPPs
② Preparation of standards for the evaluation of TPPs' skills and capabilities
③ Preparation of data base of TPPs
③ Establishment of career planning for TPPs
④ Reorganization of TPPs' organization for more effective guidance to small and medium scale enterprises (effective organizational structure, clear responsibility, cooperation with related organizations, information on successful cases, better communication among TPPs, etc.)
⑤ Preparation of manuals of the guidance and cusultancy services to small and medium scale enterprises

In order to make a plan of TPP re-training and implement it, the following tasks will be carried out:

① Designing of content of TPP re-training

The content of training necessary for the upgrading of management guidance skill, e.g., contents of public support schemes for small scale enterprises, corporate diagnosis,

marketing, management, production management, information management, etc., will be designed. Field training for TPPs lacking field experience will be included. A system in which TPPs can share their experience and exchange their views will be also examined.

② Preparation of a training plan

A training plan of TPPs according to the level of experience and capability will be prepared and the implementation schedule of training will be made.

③ Implementation of the training plan

The training of TPPs will be regularly carried out and the TPPs' capability will be continuously upgraded.

3) Implementing Organizations

Directorate General of Small Industry and Trade under MOIT will be responsible for the establishment of the master plan. As for training programs for TPPs, it will cooperate with PUSBINLAT, R&D institutions under MOIT, etc.

B. Expansion of Training Programs for the Improvement of the Management Skills of the Small and Medium Scale Industries

1) Objective

The objective of this sub-program is to upgrade management training through PUSBINLAT. The main targets of training are: i) managers of small and medium enterprises, and ii) the above mentioned TPPs.

2) Content of the Program

The following activities will be carried out by PUSBINLAT:

- to develop curriculum on small and medium enterprise management
- to hold short-term courses on small and medium enterprise management

- to hold long-term courses on small and medium enterprise management

Curriculum will be developed through the following measures:

- Review of existing curriculum
- Joint development with outside organizations
- Participation of outside experts

The following are examples of curriculum to be developed.

Short-term Courses: To be held at PUSBINLAT, Kanwil, Kandep, and other related local centers

Period: Night courses, one day courses, and 1 to 2-week courses

Courses: Examples of courses are as follows:

Marketing/ export marketing/ financial management and fund raising/ human resource management/ production management/ quality control/ entrepreneurship development/ small and medium enterprise diagnosis and consulting skill development

Long-term Courses: To be held at Akademi Pimpinan Perusahaan (APP) under the supervision of PUSBINLAT.

Period: 3 to 6 months

Courses: Management diagnosis, business management and production management

Content: Combination of training at APP, correspondence course, and practice/team project at small and medium enterprises.

3) Implementing Organizations

PUSBINLAT, including its academies, will be responsible for the implementation of the program. Curriculum will be developed with the cooperation from the Pendidikan dan Pelatihan Ekspor Indonesia (PPEI), universities, the Ministry of Manpower, and Ministry of Education and Culture.

(5) Supporting and Export Oriented Small and Medium Industries International Competitiveness Strengthening Program - Two Step Loan (TSL)

1) Objective

a. To strengthen the international competitiveness of the Indonesian supporting industries by providing both technical and financial support
b. To strengthen the export capabilities of the Indonesian Small and Medium Industries by providing both technical and financial support

2) Target Industries

a. Those supporting industries that have the potential to be internationally competitive by providing financial support for the expansion of their production facilities
b. Small and medium scale supporting industries that have the potential to produce internationally competitive products and to increase their sales both for domestic and overseas markets by providing financial support for the procurement of raw materials
c. Those small and medium industries that would largely expand their exports by providing financial support both for the expansion of production capacity and for raw materials and parts procurement

3) Contents of the Proposed Project

The proposed project consists of the following 4 packages of schemes.

Package 1. Supporting Industry International Competitiveness Strengthening Fund

Making use of the Two Step Loan (TSL) scheme of international financing organizations, capital investment funds are provided, and the international competitiveness of the Indonesian supporting industries is to be strengthened. A part of the TSL funds is to be allocated to the establishment and management of a technical support service team (TSST-Package 4), which would give technical support service for supporting industries and would also work as

an intermediary between assemblers and supporting industries in technical areas.

Package 2. Small and Medium Supporting Industry Financial Support Fund

Making use of the Two Step Loan (TSL) scheme of international financing organizations, short-term working capital funds for the procurement of raw materials and parts are provided for those small and medium supporting industries which have enough technical capabilities. A part of the TSL funds is to be allocated to the establishment and management of a technical support service team.

Package 3. Export Oriented Small and Medium Industry Development Fund

Making use of the Two Step Loan (TSL) scheme of international financing organizations, capital investment, as well as working capital, funds are provided, and the export capabilities of the Indonesian small and medium industries are to be strengthened. A part of the TSL funds is to be allocated to the establishment and management of TSST, which would provide technical support service for export-oriented small and medium industries and would also work as an intermediary between importers and the Indonesian industries in technical areas.

Package 4. Supporting Industry and Export Oriented Small and Medium Industry Technical Support Program

Package 4 proposes the establishment of a technical support service team in the Ministry of Industry and Trade, for which a part of the proposed TSL funds is to be allocated. The major activities of the Technical Support Service Team would be as follows.

- Organizing the total activities of technical support experts in Indonesia
- Access to the market needs for technical experts and arranging the recruitment of new experts
- Work as intermediaries between assemblers and supporting industries
- Work as intermediaries between importers and local potential exporters
- Support the access of capable SMIs to relevant financing schemes, and implement the technical appraisal for the proposed TSL loan applications
- Coordination of the progress of loan activities with handling banks and monitoring of the results of loan disbursement