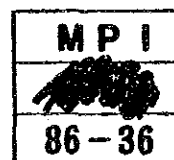


**THE STUDY REPORT
ON
DEVELOPMENT OF LINKAGE-TYPE INDUSTRY
IN
THE REPUBLIC OF INDONESIA

(SUMMARY)**

MARCH, 1986

JAPAN INTERNATIONAL COOPERATION AGENCY





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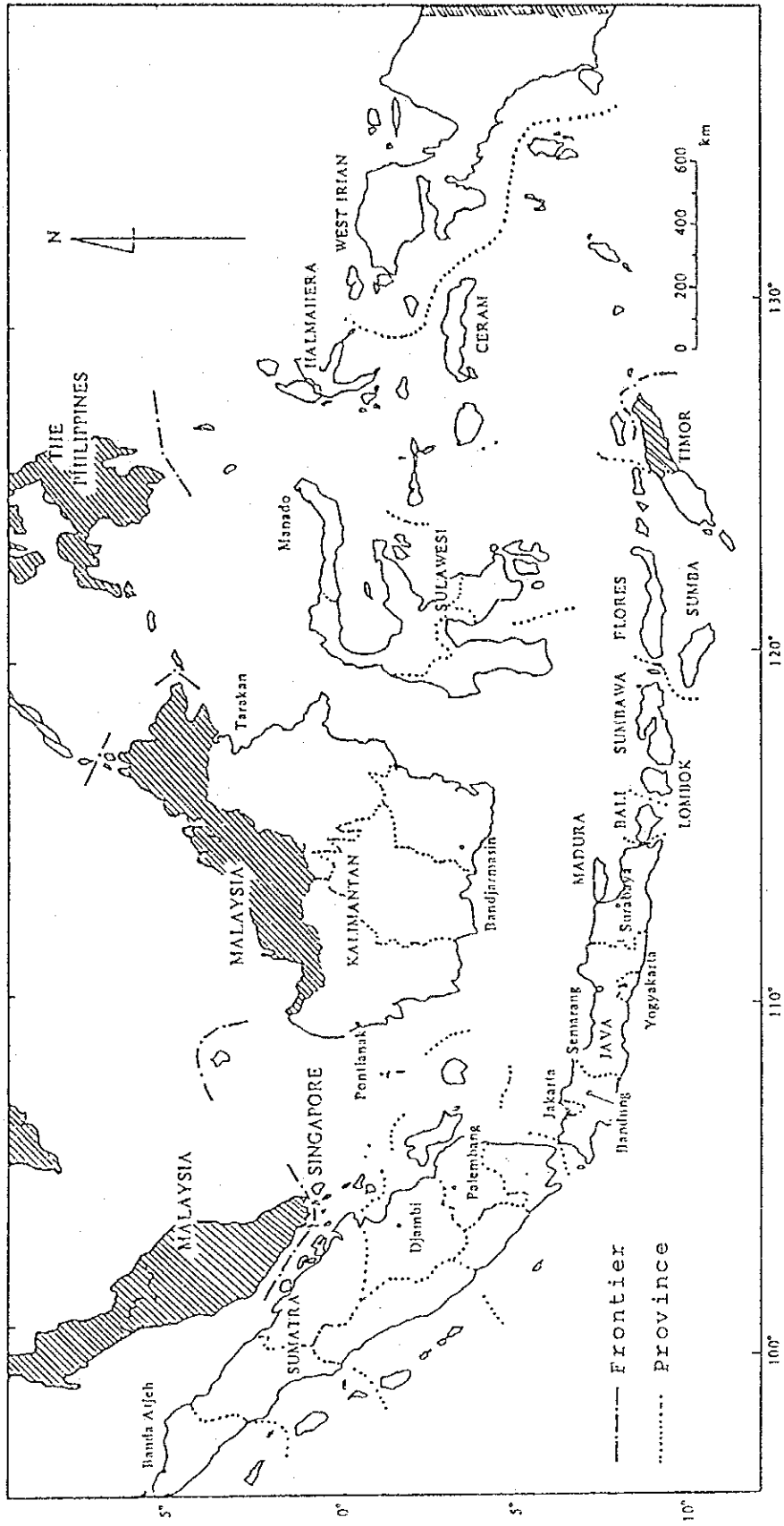
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MARCH, 1986

JAPAN INTERNATIONAL COOPERATION AGENCY

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INDONESIA



(Source) : Atlas Indonesia, Yayasan Dwidjendra, 1976, Denpasar

ABBREVIATION AND SYMBOLS

Organization and Company

MOI	Ministry of Industry in Indonesia
MOF	Ministry of Finance
Kanwil	Cantor Wilayah (Provincial Office)
B.I.	Bank Indonesia
BKPM	Badan Koordinasi Penanaman Modal (Investment Coordinating Board)
BNI	Bank Negara Indonesia 1946
BDN	Bank Dagang Negara
BBD	Bank Bumi Daya
BAPINDO	Bank Pembangunan Indonesia
IBRD	World Bank
BEI	Bank Export Import Indonesia
BRI	Bank Rakyat Indonesia
P.T. Askrindo	P.T. Asuransi Kredit Indonesia
BDE	Bank Duta Ekonomi
OEB	Overseas Express Bank
BPD	Bank Pembangunan Daerah
KfW	Kreditanstalt Fur Wiederaufbau
ADB	Asian Development Bank
JICA	Japan International Cooperation Agency
JETRO	Japan External Trade Organization
OECD	The Overseas Economic Cooperation Fund
IMF	International Monetary Fund
BOT	Bank of Tokyo

BPS	Biro Pusat Statistik (Central Bureau of Statistics)
IDFC	Indonesian Development Finance Company (UPPINDO)
PDFCI	Private Development Finance Company of Indonesia
LJKK	Lembaga Jaminan Kredit Kooperasi (Institution of Credit Guarantee for Cooperative)
GAMMA	Federation of Indonesian Metalworks & Machinery Industry
ABI	Association of Indonesian Internal Combustion Engine Manufacturers
ALSINTANI	Association of Indonesian Agricultural Machinery
APKOBI	Association of Indonesian Steel Structure
ASPEP	Association of Workshops and Machineries
APLINDO	Association of Basic Metal Works
AIMKI	Association of Machine Tool Industry
ASIMPI	Association of Construction Machine Industry
AIPSI	Association of Pump Manufacturers
AIPPI	Association of Plant Machinery Manufacturers
APPLI	Association of Electric Instrument Producers

Financial and Economic Terms

GDP	Gross Domestic Product
GNP	Gross National Product
GDI	Gross Domestic Investment
GDS	Gross Domestic Savings
C & F	Cost and Freight
CIF	Cost, Insurance and Freight
FOB	Free on Board
M.M.	Million

M.	Thousand
KIK	Kredit Investasi Kecil (Investment Credit for Small Enterprises)
KMKP	Kredit Modal Kerja Permanen (Permanent Working Capital Credit)
SEDP	Small Enterprise Development Project
KIB	Kredit Investasi Biasa (General Investment Credit)
KCK	Kredit Candak Kulak (Working Capital Credit for Villagers)

Currency and Exchange Rate

Rp	Indonesia Rupiah (1 U.S.dollar = Rp.1,110.- August, 1985)
US\$	U.S. Dollar
Yen	Japanese Yen (1 U.S.dollar = 235 yen August, 1985)

Technical Terms and Others

CKD	Complete Knock Down
CBU	Complete Built Up
BRT	Brutto Register Tonnen (equal G.T.)
G.T.	Gross Registered Tonnage
DWT	Dead Weight Tonnage
CSF	Common Service Facilities
Q.C.	Quality Control
DCI	Ductile Cast Iron
NBR	Number
KNS	Pengembangan Kapasitas Nasional Sektor Industri (Development of National Capacity for Sector)

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(SUMMARY)

Part I SUMMARY

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SUMMARY AND CONCLUSION

[SUMMARY AND CONCLUSION]

I. INTRODUCTION

1. Background

The development of manufacturing industries is one of the fundamental strategies which the Government of Indonesia has adopted for economic development in the Fourth Five-Year Development Plan (REPELITA IV) started in April, 1984. Specifically in the industrial development the Government gives high priority to the promotion of the industries which are related to the engineering industries and basic metal industries.

In order to attain the above goal, the Government of Indonesia has requested the Government of Japan to conduct a study necessary for formulating measures for the promotion of linkage-type metalworking industries. In response to this request, the Japan International Cooperation Agency (JICA) has conducted the Study on Development of Linkage-Type Industries in the Republic of Indonesia. This report summarizes the results of the Study thus conducted by JICA.

2. Objective and Scope of the Study

The objective of the Study is to examine a development program of the linkage-type metalworking industries, from technical, economic and financial points of view, for the Government of Indonesia.

The linkage-type industries can be further identified as metalworking industries which presently have or will possibly have linkage to large-scale machine assembly industries. The target industrial group to be developed is defined as the following subsectors:

- 1) Casting
- 2) Forging/heat treatment
- 3) Sheetworking/welding
- 4) Plating
- 5) Machining
- 6) Presswork
- 7) Repairing

The above metalworking industries are in a position to supply components and parts as subcontractors to the large- and medium-scale machine assembly

industries (hereinafter referred to as "assembly-type industry" in an opposite meaning of "linkage-type industry").

The assembly-type industry is also identified as follows:

- 1) Machine tools
- 2) Agricultural machinery & equipment
- 3) Heavy equipment and construction machinery
- 4) Process equipment
- 5) Electrical machine
- 6) Shipbuilding
- 7) Automotive
- 8) Motorcycle

The objective of the Study is first to clarify underlying problems in and between the linkage-type industry and the assembly-type industry and finally to recommend a development program, which will promote vertical and/or horizontal business linkages between these two types of industries.

The development program to be recommended for the linkage-type industry is a package of overall promotion measures including the selection of types of industries to be developed, a review of the supporting systems for the modernization of technologies and the development financing systems and implementing agencies, common services facilities necessary for development, and policy recommendations for promoting their development.

3. Methodology of the Study

The Study was initiated with a questionnaire survey and an interview survey of firms selected from both the assembly-type industry and the linkage-type industry. In the assembly-type industry 55 firms responded to the questionnaire mailed to 160 firms, while information of 219 firms categorized into the linkage-type industry was gathered through interviews and filling in the questionnaire sheets conducted by extension service workers of the regional office of the Ministry of Industry. Besides the questionnaire and interview surveys, the JICA Survey Team conducted visits to selected factories, research institutes and training centers, as well as interviews of discussions with government authorities, banks and the representatives of the industries to identify prevalent conditions and problems. Based on the thus gathered information and the Team's findings, the Survey Team made the assessment of relevant issues and problems to examine the measures to be taken for the promotion of the linkage-type industry. The development program recommended in the report was thus derived from those findings and assessment.

II. INDUSTRIAL LINKAGE BETWEEN ASSEMBLY- AND LINKAGE-TYPE INDUSTRY

1. Overviews of Prevalent Conditions of Metalworking Industries

According to the industrial statistics - 1982 published by BPS (Central Bureau of Statistics), in Indonesia there are 392 establishments engaged in the assembly-type industry, those classified in the statistics as (1) machinery and repair (2) radio, T.V., and other, (3) electrical apparatus etc., (4) ship building and repairing, (5) motor vehicles assembling and manufacturing, (6) motorcycle assembling and manufacturing, and (7) motorvehicle body and equipment. These sectors employ 80,000 employees in total (an average number of 204 employees per establishment) and generate Rp.450 billion of value-added (an average value-added of Rp.5.6 million per employee) with a local content of 24.6% in average.

The given figures exclude small-scale establishments employing less than 20 employees, since there is no published statistics showing the small-scale. Nevertheless, the figures can be deemed to represent the assembly-type industry, because the establishments engaged in that industry are the large- and medium-scale in terms of the number of employees.

There are a numerous number of establishments engaged in metalworking industries including the linkage-type industry. Although there is no statistics showing the number of establishments engaged in these sectors, it is estimated that there are approximately 2,600 establishments of the metalworking industries employing less than 200 employees, of which an overwhelming majority is small-scale establishments.

The findings on the prevalent conditions of the medium- and small-scale metalworking industries are summarized below:

(1) Casting

In Indonesia there are a numerous number of medium- and small-scale casting works. However, most of those works are based on traditional technologies. A defect rate of the produced casting products is estimated to be 10 to 20% or higher, which should be one of the factors causing high production costs. Such inferior quality of the products may be attributed to, among others, low quality of the main- and sub-materials used in the melting process, low pouring temperature, and lack of composition analysis. Analysis and measurements of molding and mechanical mixing are not commonly done for molding. Many manufac-

turers still employ floor molding, and it may cause defects such as gas flows and inclusions. There are a very limited number of manufacturers performing shot blast based on blasting in the fettling process and also having various types of grinders.

(2) Forging

For medium- and small-scale forging, die forging and free forging are suitable, but traditional blacksmith work is dominant. Most of them use mild steel, although the use of medium carbon steel and low alloy steel is required in order to provide strength and hardness. Many of automotive parts are small in size. Nevertheless they must be mass-produced for uniformity, by adopting die forging.

(3) Sheetworking/welding

The sheetworking/welding industries employ comparatively more advanced technology than other metalworking industries. However, as the present demands do not require very high accuracy or strength, the existing facilities are not modernized ones so as to be capable to produce high quality products. The welding is done manually, without testing facilities for precise pre-test such as X-ray inspection and supersonic inspection, and also without other detection equipment.

(4) Plating

The plating work is carried out as a part of the finishing process of various metalworking and machining factories which produce a variety of products each in small quantity to be sold to the general markets, and there is no specialized plating factory engaged in plating of industrial parts such as automotive parts and electrical parts. Under these situations, the existing plating work, as like as the machining factories, are not capable to meet such demands.

(5) Machining

In most cases machining process is accompanied with other metalworking process. According to the questionnaire survey, out of 219 medium- and small-scale firms, 163 firms have machining shops. However, it is observed that there is a wide gap in equipment and technology between the medium- and small-scale factories and the large-scale factories especially owned by joint-venture companies.

More than half of medium- and small-scale machining shops use conventional type lathes and bench drilling machines, and only a very limited

number of shops own grinding machine and milling machines. In addition many of those installed machines are quite obsolete so that they cannot undertake accurate and precise machining as required for producing machinery parts such as transmissions for agricultural machinery.

(6) Pressing

Most of medium- and small-scale works are producing mainly punched and bent products by using small press machines. They prepare dies by themselves, but their capability is still poor. Working life of those dies are short because of inadequate heat treatment and faulty finishing accuracies, resulting in low product accuracy. Further, most of them use traditional lever-type manual press machines.

Under the foregoing situations, there is a very limited number of modernized medium- and small-scale metalworking factories which are capable to produce high quality of components and parts as demanded by the assembly-type industry.

The operation of the existing medium- and small-scale metalworking factories is typically characterized with:

- (1) Production based on traditional or conventional technologies and also on obsolete equipment and facilities.
- (2) Manufacturing based on job-order of a variety of products each in small volume

Such operation causes inefficiency in management and production, resulting in high production costs and low quality of the produced products. It led them to be weak in competition with imports, while in turn discouraging the assembly-type industry to use local-made components and parts.

2. Present Situation of the Linkage

The assembly-type industry is engaged mainly in assembling to manufacture final goods based on components and parts largely met by imports, while the majority of metalworking industries dominated by medium- and small-scale enterprises are engaged in producing the goods for general markets, such as building materials and piping materials, by using locally available raw materials to a large extent.

The structure of the machinery and metalworking industries in Indonesia is characterised with the configuration that both the assembly-type and the

linkage-type industries manufacture the final goods for general markets, so that there is a very limited scope of business linkages existing between the assembly-type industry and the linkage-type industry.

These situations imply that, in order to develop horizontal and vertical linkages between the assembly-type industry and the linkage-type industry, it is essential to expand modernized medium- and small-scale metalworking industries which are capable to produce the industrial components and parts satisfying the level of quality as demanded by the assembly-type industry.

The following table shows a tabulation of the answers provided by 210 firms in the questionnaire survey, which relate to their total sales and sales to the assembly-type industry.

SALES AMOUNT FOR ASSEMBLY-TYPE INDUSTRIES, 1984

Size of Company	Answered	Sales Amount (Rp. mill.)		
		Total	Assemblers	%
Large	41	128,875	40,911	31.7
Medium	96	36,964	15,682	42.4
Small	73	2,953	483	16.4
Total	210 ^{1/}	168,792	57,076	33.8

Note: ^{1/} The number of valid answers out of 219 answers

The table indicates that the small-scale industries sell their products to assembly-type industries by 16.4%, while selling the rest, 83.6% to the general market. For medium-scale, the "rate of linkage" is the highest of 42.4%, while the large-scale is the in-between.

The results of the questionnaire survey and several facts found by the Study Team during the field survey imply that:

- 1) There may be difficulties for small-scale metalworking industries to play a central role to have linkage with assembly-type industries due to their obsolete and small production units, as well as their inferiority in technical level and skill of workers.

- 2) The manufacturer's sizes of medium-scale and just smaller than large-scale can play the main role of linkage-type industries and their growth potential is high.

In order to promote the development of the linkage-type industry, priority should have to be given to expanding modernized medium-scale "grower" type metalworking industries by means of modernizing the existing medium-scale metalworking factories, modernization and expansion of the small-scale factories, and the establishment of new metalworking factories while continuing technical assistances should also be provided to all the medium- and small-scale metalworking industries, especially to the small-scale industries, to improve and upgrade their technical skills and management capability.

At present, the metalworking industry, which supplies components to the machine assembly industry, cannot compete with imported products due to the inferior product quality and high cost. The cost disadvantage may be improved by considering the import duties and also by cost-down which can be achieved by the advancement of mass-production. However, as the improvement of product quality can only be brought about by the improvement of the manufacturing technology, priority should be given to quality improvement in promoting the linkage-type industry.

3. Measures Required for Developing the Linkage-Type Industry

(1) Manufacturing technology

As has been discussed earlier, technological gap of the existing medium- and small-scale metalworking industries is one of the vital factors constraining the development of the linkage-type industry. They lack the manufacturing technology to be practically applied at works, including techniques for design, strength calculation, drafting of shop-drawings and for manufacturing according to drawings. There is no place for workers to learn such technological skills as blade sharpening or how to use tools, which can be immediately utilized in their work. In addition, there are shortcomings of published text books on these techniques. In order to improve and upgrade their technical gap, it is important to consider the establishment of technical service centers which provide them with those vocational trainings and technical services including extension services and technical guidances for quality improvement.

(2) Industrial standards and product inspection

Lack of a common-use technical language - industrial standards and drawings - is one of the technical problems which obstruct the development of linkages between the assembly-type industry and the linkage-type industry. The government authority has launched on the work to define standards of the metalworking products, but they will not include design standards, drawing methods, manufacturing methods and inspection methods.

Another problem is a shortage of the institutions which provide the industries with inspection services for metalworking products.

In order to foster the linkage-type industry and thereby promote the localization of components and parts to be used by the assembly-type industry, it is important to induce applicable standards and establish inspection institutions for the metalworking products.

(3) Education of entrepreneur

Most of entrepreneur engaged in the metalworking industries do not realize on the benefits of improving product quality, performing planned production based on long-term constant supply arrangements, and operating mass-production systems with modernization of manufacturing facilities. It is important to educate them to induce advanced management concepts and improve their conventional business customs.

(4) Provision of information

There is a lack of communication between the machinery assembly companies and the metalworking companies. The medium- and small-scale metalworking companies are virtually weak in gathering market information and establishing business channels with the machinery assembly companies. It is important for the Government to establish appropriate means for providing them with market information and introducing them to machinery assembly companies, as well as providing assistance to enhance their marketing capability.

(5) Encouragement of joint efforts among metalworking companies

There are successful cases of the joint purchase of raw materials and of the joint marketing of products performed on a cooperative basis in Central Java. It would be effective to encourage the manufacturers to organize their joint activities.

(6) Role of large-scale machinery assembly companies

Large-scale machinery assembly companies can play an important role to foster the linkage-type industry by means of increasing their subcontracting purchases of components and parts and also providing technical assistances and technology transfer to subcontractors. It is important for the Government to take appropriate practices for encouraging the large-scale machinery assembly companies to positively undertake such activities.

(7) Preventing labor turnover

One of the problems which the metalworking industries have been encountering is frequent turnover of skilled labor. It is important for the Government to educate and guide entrepreneur engaged in the metalworking industries to take measures for preventing the frequent turnover of skilled labor by means of increasing wage and salary to a reasonable level, improving working conditions and welfare, and adopting a payroll system which provides incentives to workers staying longer, while standardizing work procedure and also conducting vocational trainings for new workers.

III. PROMISING SUB-SECTOR IN METALWORKING INDUSTRY AND INVESTMENT OPPORTUNITY STUDY

1. Promising Subsectors in the Metalworking Industries

As a basis for developing the linkage-type industry, the Study attempts to identify promising subsectors to be developed in the metalworking industries. The identification is made in view of marketability of products and technical level to be possibly attained by manufacturers.

(1) Marketability

1) Market size

In Indonesia, since the metalworking industries can be regarded as import substitution industries for some time to come, the size of the domestic market is a crucial element. The increase in the size of the domestic market is projected as the sum of the natural increase in demand and the prospect of localization replacing imports.

As long as a natural demand increase is deemed very little because of the depression which is anticipated to persist, the progress of localization has more importance. In this context, the industries which directly supply parts and components to the industries under government's strong localization policy are considered promising. Those priority industries are automobile, machine tools and construction equipment.

2) Prospective client

The market can be broadly classified into the following four: sub-contract for assembly-type industries, government purchase such as for public works, after-market for repair and maintenance parts, and sales to the general market. Government purchases for public works and supply for assembly-type enterprises are more stable market than others.

The government purchase will be electrical parts related to power development and electrification of rural villages and irrigation pumps for modernization of rural areas. The sub-contract will be automotive parts, electric home appliance parts, and parts for heavy equipment and agricultural machinery.

3) Price competitiveness

Products being competitive with imported products in terms of price are deemed promising. Products for which the raw materials are available at low price and the manufacturing process is labor intensive are generally considered as being competitive in price. Labor intensive products, however, are inferior in terms of quality and precision to the imported products which are produced in mass-production based on modern facilities.

Another possibility is the products the manufacturing of which are anticipated to be shifted from advanced countries to developing countries due to manpower shortage on account of soaring wages and hard work. Casting products fall into this category.

(2) Technical level

1) Manufacturing technology

Products which involve many manufacturing steps or many control factors (such as temperature, time for processing, etc.) tend to be poor in quality because errors in each step or factor are accumulated in the final products.

Products which can be self designed by manufacturers or products specified with simple and clear standardization are considered to be particularly promising for medium and small firms. In this context, pressworking and casting products are promising types of industry. On the contrary, welding of special alloy steel or cutting, welding and heat treatment of products with large plate thickness and others which require advanced manufacturing and inspection technologies are unlikely to be promising, because a fairly long period is required for acquiring the necessary technology.

2) Manufacturing facilities and product quality

Manufacturing of metal dies and molds for presswork and bearings, gears, etc. for high speed rotary machines and other products that require high precision are the fields in which Indonesia greatly lags behind in facilities, skilled manpower and technical level for plant management. It would be difficult to fill this technical gap in a short period.

Also, domestic raw materials are unsuitable for use in high precision products because of their uneven quality. Highly automated manufac-

turing facilities pose problems in terms of repair and maintenance because machine parts are not obtainable in Indonesia. Furthermore, the production using such facilities may also result in high costs, unless there is an adequate market for the product, because they are expensive and also have rather large production capacities. Accordingly, parts manufacturing that requires highly automated manufacturing facilities is unlikely to become promising in the immediate future.

Parts and components deemed promising from the aforesaid viewpoint are listed by the sub-sector and by the process in Table 1.

2. Investment Opportunity Study

In order to promote the domestic production of promising components and parts as listed in Table 1, it is essential to develop a number of modern factories which are capable to produce some of those products having required quality. Since such projects should be implemented mainly by private entities, a detailed feasibility study of the projects shall be individually made by them for their investment decision.

Nevertheless, an investment opportunity study is made on possible projects to be developed for the foregoing goal. The objective of this study is to demonstrate typical examples of the possible projects and their investment sizes which can serve to examine the direction of investment promotion.

The investment opportunity study is made on 13 identified projects which consist of the following three types.

- | | |
|--|------------|
| 1) Projects to produce a complete set of components and parts by building up modern facilities | 6 projects |
| 2) Projects of new plants with relatively small-scale investment | 4 projects |
| 3) Expansion projects of existing plants | 3 projects |

The outline of these projects are summarized in Table 2. The outcome of this study indicates that the projects to be implemented for the development of the linkage-type industry, which comprise the establishment of new facilities and the modernization and expansion of existing facilities, would require investments in a scale over that defined as a small scale, and there-

fore it implies that the investment promotion program for the development of the linkage-type industry shall be focussed on the expansion of modernized medium-scale metalworking factories. In this connection the program should be designed to promote investments by "grower" type medium- and small-scale enterprises. For small-scale enterprises who are financially unable to undertake projects respectively, it may be effective to promote joint investment by a few enterprises as stated earlier.

3. Cost Competitiveness of Local Production

The Study attempts to analyze the cost structure of the existing metalworking factories which are producing some components of the machinery assembly. Their present costs are higher by about 40% as compared to the costs in Japan. The higher production costs in Indonesia are attributed to (a) higher raw material costs, (b) higher defect rates of the products, and (c) higher financial costs. The defect rates can be reduced to a substantial extent by establishing modern factories or modernizing existing factories, as well as providing technical assistances to improve and upgrade manufacturing technologies and skills. In addition, if appropriate measures are taken to reduce the raw material costs and financial costs, there is a great possibility for the local production costs to be reduced to a level nearly comparable to the Japanese costs.

Table 1 PARTS AND COMPONENTS AS PROMISING PRODUCTS FOR METALWORKING INDUSTRY

(1/2)

Industrial Field as Market	Parts and Components
Machine tool (Lathe, Miller, etc.)	Apron component, bed, casing, pulley, frame, column components, base, table, leg, cover, gear, shaft, bearing, bolt & nuts, spring, screwshaft, coolant tank, pan, panel box, cooling system, gear, spindle, handle, hinge
Agricultural machine (Mini tractor, etc.)	Transmission, rear drive axle, brake drum and cover, front weight, shaft, final drive axle, front axle, gear, support frame, bonnet, muffler, hydraulic tank, side cover bracket, seat, step, hitch attachment, fender, brake rod, rotary frame, wiring harness, hinge, bolt and nut
Construction Equipment (Crawler bulldozer, etc.)	Counter weight, cutting edge, end bit, teeth, front idler, pin and bushing, roller, transmission, gear, shaft, torque flow convertor, track shoe, bonnet & side cover, fender, yoke, muffler, support, hydraulic tank, radiator and guard, cable wiring, filter, fan and pulley, trunion, front idler, piston, handle, hinge, screw, bolt and nut, wiring harness
Automotive & motorcycle	Engine block, brocket, pump body, pulley, casing, cover, brake drum, bearing, connection rod, shaft, gear, yoke, valve, transmission, lever, arm, lifter, pedal, clutch, brake shoe, lever, steering column, cylinder head, filter, pan support, frame, body, door lock, window sash, bumper, wheel cap, seat
Electrical machine (Diesel engine, etc.)	Base, piston, wheel, casing, valve, handle, pump, cover, bush, shaft, pin bolt, connection rod, washer, snapping, magnet, shaft key, fan, fuel tank, condensor, muffler, panel box, bracket, stator core, pan, wheel, valve, bolt and nuts, screw
Plant equipment (with Simple technology)	Tanks, heat exchanger, cooler, pump, valve, cyclon, belt conveyor, dust collector, pipe fittings, control panel, lighting fixture, overhead crane, hoist, pipe support, steel structure, filter, screen, blower, fans, boiler
Ship buildings (with Simple technology)	Propeller, motors, generator sets, transformer, pumps, switch board, heat exchanger, purifier, ladder, anchor and chain, tanks, mast, derrick post, rader post, antenna pole, boom, davit, mooring fittings, bollard, fair leader, mooring hole, deck roller, hatch cover, vent truck, dust, ventilator, deck stand, pipe support, strainer, steel furniture & fixture

Table 1 (Continued)

(2/2)

Industrial Field as Market	Parts and Components
Others (Pump, valve, hand tool, household appliances, etc.)	Casing, impeller, valve body, yoke, disk, cover, shaft, gear, spinde, ponch, driver, wrench, panel box, meter box, caster, tool box, window sash, steel furniture & fixtures, bolt and nut, screw, hinge.

Table 2 SUMMARY OF INVESTMENT OPPORTUNITY STUDY

Products	Production Capacity	Employees	Project Cost (US\$,1,000)	Equipment and Machinery (f.o.b.) (US\$,1,000)
A. Modernized factories with small and medium size investment				
(1) Small size foundry products	420 t/y	19	1,500	420
(2) Forging of screw and rivets	68 t/y	7	200	60
(3) Presswork of locker, kitchen ware, etc.	240 t/y	17	350	110
(4) Electroplating of bolts, nuts, screw, etc.	144 t/y	7	310	100
B. Expansion or re-location of existing factory^{1/}				
(5) Oil and air filter for automotive	500/2,000 pcs/d	15/50	130	24
(6) Foundry and machining of pumps	Pump 200/2,000 t/y Foundry 0/3,000 t/y	44/110	6,900	1,900
(7) Sheetwork of switch gear	1,200/6,000 sets/y	202/250	3,000	170
C. Factories fully equipped as sub-contractors directly to assembly-type industry				
(8) Casted products for machine industry	12,000 t/y	272	17,440	5,450
(9) Forging of shafts, gears, rods, etc.	4,600 t/y	102	8,150	3,140
(10) Precise machining of driving components	639 t/y	163	8,100	3,590
(11) Sheetwork case and cover for transmission, etc.	1,500 t/y	90	1,710	420
(12) Presswork for kWh meter box, etc.	1,380 t/y	25	1,710	480
(13) Steel fabrication of out-fittings for ship, etc.	1,500 t/y	97	4,790	680

Note: ^{1/} (a)/(b): (a) is before-expansion while (b) represents after expansion, and investments cost are additional requirements for expansion.

IV. INSTITUTIONAL FINANCING SYSTEM FOR INDUSTRIAL SECTOR

In June, 1983, a financial sector reform was conducted in Indonesia. This reform abolished the short-term general credit previously made and Category II to IV of KIB which were credit for medium-scale enterprises, while setting new programs such as (a) short-term working capital credit up to Rp.75 million which is equivalent to the former KIB-Category I, (b) Keppres 29/1984 which is short-term credit of working capital required for procurement by government organizations, and (c) export credit.

OUTLINE OF KIB SYSTEM (ABOLISHED IN JUNE, 1983)

Kinds	Category-I	Category-II	Category-III	Category-IV
Maximum loan amount (Rp. million)	up to 75	75 - 200	200 - 500	500 - 1,500 (BAPINDO; 2,500)
Purpose	Equipment	Equipment	Equipment	Equipment
Handling banks	6 state banks			
Interest rate	10.5%	12.0%	13.5%	13.5%
BI refinance interest rate	3%	3%	4%	4%
Min. self finance by Borrower	20%	25%	30%	35%
Security requirement	Completed facilities with this loan plus collateral at 50% of loan amount			
P.T. Askrindo's insurance	Handling banks may request for insurance/guarantee, but subject to Askrindo's acceptance			

The reorganization also adopted a simplified on-lend rate structure. A 12% point was applied to 17 programs; except for the short-term working capital credit up to Rp.75 millions and Keppres 29/1984 set at a 15% point, export credit set at a 9% point, and housing and education credit set at a 5 to 9% point. The outline of each program is given in Table 3.

In the long-term view, it is likely that the financial sector reform enacted in June, 1983 will stimulate the effective operation of the banking system from viewpoint of national economy. However, the abolishment of BI's refinance for

KIB-Category II to IV and short-term general credits provided by the state banks increased the funding cost of the state banks, and further, because of deregulation of the interest rates, the interest rates charged to non-priority borrowers rised swiftly.

Creditable large-scale enterprises would be possible to borrow low cost loans from external sources, while small-scale enterprises can still borrow the low interest rate loans under the special credit program. The medium-scale enterprises, however, should be rather difficult to borrow low interest rate loans because of the deleted KIB-Category II to IV which provided low interest loan with loan size ranged from Rp.75 million upto Rp.1,500 million.

Table 3 CHARACTERISTICS OF CREDIT SCHEMES IN INDONESIA

(1/3)

Name of Schemes	Date of Commencement	Category of Use	BI's Credit for High Priority Sector	Handling Bank (HB)	Maximum Loan Amount (Rp.)	Source of Funds	Minimum Self Financing	Maximum Lending Term	Interest Rate p.a.	BI's Fund Interest Rate p.a.	Collateral Requirement	Insurance Coverage
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1. Kredit candaq kulak (KCK)	Apr. '76	Working Capital (WC)	-	Village Co-operatives (KUD)	2,000 15,000	Government Budget	0%	5days-7months	12%	-	-	Government
2. General rural credit (KUPEDES)	Feb. '84	Investment (I)	-	BRI	1MM	BI 100%	-do.-	3years	-do.-	3%	Assets created	BI/BRI
		W.C.		-do.-	1MM	-do.-	-do.-	2years	18%	15%	-do.-	-do.-
OF which mini credit	(Apr. '74)	I	-	-do.-	200M	Government	-do.-	3years	12%	-	-do.-	Gov't/BRI
midl credit	(Jun. '80)	I	-	-do.-	500M	BI 100%	-do.-	5years	-do.-	3%	-do.-	BRI
3. BIMAS/INMAS credit	'64	W.C.	-	-do.-	Package	-do.-	-do.-	7months	-do.-	-do.-	Land certi- ficate/Other assets	Gov't 50% BI 25% BRI 25%
4. Small investment credit (KIK)	Jan. '74	I	-	National banks	15MM	BI 55% WB 25% HB 20%	-do.-	3years	-do.-	BI 3% WB 10.1%	Assets created+max 50% of loan	Askrido 75% HB 25%
5. Permanent working capital credit (KMKP)	Jan. '74	W.C.	-	-do.-	15MM	-do.-	-do.-	5years	-do.-	BI 3% WB 10.1%	-do.-	-do.-
6. Investment credit up to Rp.75MM	Jun. '83	I	-	-do.-	75MM	BI 80% HB 10%	10%	10years	-do.-	3%	Assets created+ additional collateral	-
7. Working capital credit up to Rp.75MM	May '84	W.C.	-	-do.-	75MM	BI 70% HB 20%	-do.-	1year	15%	-do.-	Assets created	Askrido 70% HB 30%
8. Working capital credit for gov't project (Keppres 29/'84)	May '84	W.C.	-	-do.-	200MM	-do.-	-do.-	-do.-	-do.-	-do.-	Assets created/ project concerned	-do.-

Table 3 (Continued)

(2/3)

Name of Schemes	Date of Commencement	Category of Use	BI's Credit For High Priority Sector	Handling Bank (HB)	Maximum Loan Amount (Rp.)	Source of Funds	Minimum Self Financing	Maximum Lending Term	Interest Rate P.a.	BI's Fund Interest Rate P.a.	Collateral Requirement	Insurance Coverage
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
9. Credits for agricultural specific sector for binas program	Nov. '69	W.C.		State commercial banks	unlimited	BI 75%	25%	-do.-	12%	-do.-	Commodities concerned	-
10. Export credit	Jan. '82	W.C.		National banks	-do.-	BI 60% HB 40%	0%	-do.-	9%	-do.-	-do.-	Askrindo85% BI 7.5% HB 7.5%
11. Cooperatives credits												
a. For the members & for supply of high priority goods	Sept. '81	I		-do.-	15MM	BI 90% HB 10%	-do.-	10 years	12%	-do.-	Assets created	PerumpKK90% BI5% BR15%
b. For the farmers under intensification program of paddy & crops	Apr. '85	W.C.		BRI/KUD	Package	BI 100%	-do.-	1 year	-do.-	-do.-	Assets created/ other assets	PerumpKK95% BRI 5%
12. Paddy field formation	Sept. '79	I		Channelled thru. Dept. of agriculture	unlimited	-do.-	-do.-	1-2 years	-do.-	-do.-	Gov't. guarantee	Government
13. Plantation credits												
a. Estate smallholder		I		National banks	-do.-	BI 80%	un-identified	20 years	-do.-	-do.-	un-identified	un-identified

Table 3 (Continued)

(3/3)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Name of Schemes	Date of Commencement	Category of Use	BI's Credit for High Priority Sector	Handling Bank (HB)	Maximum Loan Amount (Rp.)	Source of Funds	Minimum Self Financing	Maximum Lending Term	Interest Rate p.a.	BI's Fund Interest Rate p.a.	Collateral Requirement	Insurance Coverage
b. Replanting rehabilitation & development of export commodity plants		I		-do.-	-do.-	-do.-	-do.-	-do.-	-do.-	-do.-	-do.-	-do.-
c. Private national plantation (PSN)		I		-do.-	-do.-	BI 853	-do.-	10 years	-do.-	-do.-	-do.-	-do.-
		W.C.		-do.-	-do.-	BI 753	30%	un-identified	-do.-	-do.-	-do.-	-do.-
14. Credits for house ownership (KPR)		I										
a. Public housing	Nov. '78	I		BTN	3.5MM	Gov't budget	10-20%	20 years	5-9%	-	House	Gov't/BTN
b. Non-public housing		I		-do.-	7.5MM	BI 90%	-do.-	-do.-	9%	3%	-do.-	BTN
15. Student loan												
a. For Indonesian students (XMI)	May '82	W.C.		BNI'46	750M	BI 100%	0%	10 years	6%	-do.-	Diploma	Askrindo 75% BI 18.75% BNI 16.25%
b. For student dormitories for 5 universities		I		un-identified	5.5 billion	BI 80% HB 20%	-do.-	20 years	5%	un-identified	un-identified	un-identified

Notes:

- 1/ Investment credits; 9 categories, of which 2 schemes for industrial sector: KIK and investment credit up to Rp. 75MM.
- 2/ Working capital credits; 11 categories, of which 3 schemes for industrial sector; KMKP, working capital credit up to Rp. 75MM, and working capital credit for government project (keppers 29/1984).
- 3/ Other credits; 4 categories
- 4/ No. 12; excluding the credit channelled through the government.

Source: Bank Indonesia

V. PROPOSED DEVELOPMENT PROGRAM FOR THE LINKAGE-TYPE METALWORKING INDUSTRY

1. Basic Concept of the Program

Technical and financial facilities exist to a certain extent in Indonesia, for the purpose of fostering small-scale industries. It can be said that the Government's continuous efforts are now showing positive results.

In the field of the metalworking industries, however, there is a critical lack of modernized factories which are capable to undertake a constant supply of components and parts with high and uniform quality to the assembly-type machine industry. The overwhelming majority of existing factories are classified into cottage industry in virtue, and they are equipped with obsolete facilities, using the traditional technologies. The existing machinery and metalworking industries are characterized with a structure which is bipolarised into a group of large-scale machine assembly industry with many of them being joint ventures or state owned companies and a group of small-scale industry which is dependent on the traditional technologies. Medium standing companies to fill up the gap between these two groups have not been sufficiently fostered up until now. This is the biggest reason why the expansion of the domestic supply of machine parts replacing imports has been hampered in Indonesia.

Based on this understanding of the current state of the Indonesian metalworking industry, it is proposed here that efforts should be focussed on expanding the growing type of modernized metalworking industries consisting of those companies with a sizable operation which is called as the "Grower", rather than those companies which are dependent on the traditional technologies and which are collectively called as the "Stayer", although continuous efforts should also be made for the Stayer to upgrade their technical skills and management capability.

To a group of small-scale industry, KIK/KMKP upto 15 million Rupiah and the investment credit up to 75 million Rupiah are provided as special credit facilities and vocational training centres, common service facilities, mini-industrial estates and extension services through local offices of the Ministry of Industry (KANWIL), are available in the aspect of technical assistance.

As a result of the 1983 reform of the financing sector, there is no institutional finance available for the companies which were eligible for the previous KIB Category II or above. Hence, medium-scale and growing small-scale companies which have a most vigorous demand for financing are

obliged to borrow high interest loans, resulting in discouraging their investment. It would be necessary to establish an investment credit system for providing low-interest, long-term finance for the medium- and small-scale metalworking companies in order to develop the modern metalworking industry.

The proposed program is a development finance program designed to provide a soft-term credit to a selected number of companies who intend to modernize their technology and facilities, aiming at intensively fostering a certain number of model factories, so that success of their investments can be demonstrated for stimulating the investments to be made by other manufacturers for the modernization of their facilities.

In this context it is proposed to implement the first phase program with a certain amount of funds prepared for financing to a limited number of projects, focussing on stemming effective impacts on the target subsectors to be expanded through subsequent phases of the program.

It is well known that technical assistance is a must for modernization of medium- and small-scale industry in addition to the provision of credit facilities. The proposed program shall include such services as Technical Assistance Services (TA) and the establishment of Common Service Facilities (CSF). It is recommended that these services and facilities will directly relate to those companies subject to the fostering efforts.

The basic concept of the comprehensive development program being proposed in this Report is summarized as follows.

- 1) The objective of the program shall be to expand modernized medium- and small-scale metalworking industry, particularly the linkage-type industry.
- 2) To meet the above objective, a program loan is to be newly enacted to provide soft-term investment credit for those projects.
- 3) As a first step, the program shall provide a limited number of projects, as model cases, with comprehensive services so as to ensure their success. With their success, the size of the credit facility, the number of companies and target subsectors shall be expanded on step-by-step.
- 4) The development program is to be a package program combining the provision of a special program loan, and the provision of TA and CSF.

2. Eligibility of Borrowers for the Proposed Program Loan

One of the most important requisite for success of the program is to identify pipeline projects which are financially viable and eligible to the proposed program loan. The followings are suggestion of the Study Team for reference, although the criteria of the eligibility to the loan shall be mutually discussed between Indonesian Government and a prospected financier(s).

2.1 Eligible Subsector

Eligible subsector is to be the linkage-type metalworking industry. Those companies, however, which have potentiality to become or grow up to one of the linkage-type industries even though no link is presently made to the assembly-type industries shall also be considered as being eligible, since the objective of the program is not only to "foster" the linkage-type industry for the immediate needs but also "foster" the candidates to be grown for the future expansion.

2.2 Ownership of Company and Usage of the Loan

Companies owned by Indonesian citizen shall be the main target of the program loan. It is recommended to consider joint ventures with foreign companies also as eligible companies as long as they satisfy the conditions set in terms of company scale and other requirements, because the introduction of technology, technical assistance and the transfer of technology given through the joint ventures will all play important roles in the modernization of the subsector concerned. As for Common Service Facilities (CSF), public sector companies or organizations should be regarded as eligible due to its public nature.

The investment for the establishment of new facilities but also for the expansion of existing facilities should be considered as eligible projects, provided that those projects be based on modern technology and facilities. Application of modernized technology and facilities for the subject projects should be assessed and guided in the process of loan appraisal.

The main subject of financing should be investment to production facilities in view of the basic concept of the program. Loan applications for working capital which do not involve investment to production facilities should not be eligible.

2.3 Company Size and Credit Ceiling

- (1) If the subject of the present program loan is restricted to small-scale industries, most of the growing type industries would be excluded, contradicting the program's basic objective.
- (2) It is undesirable for the eligible size of companies to be determined only in terms of the number of employees. In general, the size of the asset and the number of employees should be simultaneously used to determine the company size eligible for the loan.
- (3) Although KIK/KMKP is available as institutional financing for small-scale industries, it is undesirable for small-scale industries to be excluded from the program loan as they would not be able to enjoy such benefits as technical assistance, etc. which are an integral part of the package program.
- (4) Another way to determine the size of companies which are eligible for the loan is to control simply by means of a maximum ceiling of the credit. In general, however, both the size of assets of the company before investment and the credit ceiling are used to define the size of companies eligible for loans.

Modernization usually requires a fairly large investment amount and, therefore, a minimum lending limit may be introduced with a view to leaving those requirements needing a small amount of credit to the other existing credit facilities.

- (5) It is recommended to carefully examine an eligible company size and a credit ceiling in view of the above-described guidelines.

The following is one of the possible criteria, which have been examined in due consideration of the eligibility conditions applied to similar program loans and also of the requirements in Indonesia.

Existing Asset Size	(Maximum):	Rp.1,000 to 2,000 million
Credit Limit	(Maximum):	Rp. 500 to 1,000 million
	(Minimum):	Rp. 15 million

2.4 Profitability of Firm Level Project

In the process of loan appraisal, it is necessary to assess the project's profitability in addition to security and creditability for the loan. The Internal Rate of Return (IRR) is generally used as a tool for assessing profitability. The minimum IRR value (the cut-off rate) will, therefore, be set up so that finance is only available to those projects which are anticipated to generate the returns over cut-off rate.

The IRR cut-off rate is determined by reference to the lending rate of interest, the inflation and the average rate of return for the manufacturing industry in Indonesia. The cut-off rate is commonly given at 10 to 15% in a constant price term.

3. Source of Funds, and Terms and Conditions of the Loan

3.1 Source of Funds and Two-Step Loan

In general, a so-called two-step loan arrangement is based on aid finance provided by bilateral aid financing institutes or international financing institutes, combining local currency funds prepared by the central bank, as well as the handling banks in the recipient country. These funds are blended and managed in a special account. These original funds may be provided on concessional terms and conditions or commercial ones. The overseas funds found in hard currency(-ies) are mainly used for the import of machinery and equipment while the local funds are basically used for local procurements and the construction of buildings, etc. In the case of two-step loan for medium- and small-scale industries, however, the demarcation between the foreign and local currency portion is not rigorously applied for the smooth and flexible fund management.

3.2 Interest Rates of Sub-Loans

The following three factors determine the interest rates of sub-loans.

- 1) The cost of the original funds and the spread, that is the cost and charges for the management of the program loan.
- 2) The interest rate appropriate for the effective fostering of the target industries.
- 3) The interest rates of existing finance systems or similar program loans in the country.

In this Report, as item (1) above is not yet known, based on (2) and (3), it would appear preferable that the interest rate for sub-loans be between 9% upto a maximum rate of 12%. The final interest rate, however, should be decided when the cost of the original funds is defined. It may be unnecessary to set up different interest rates for investment to fixed assets and for working capital.

3.3 Terms of Repayment

As the loan will be made for the long-term investment for production facilities, the provision of preferential repayment conditions should be offered to end-users, namely the borrowers of the sub-loan.

One possibility is a maximum repayment period of 15 years with a maximum grace period of 5 years. Even if it becomes necessary to shorten these periods, the term of repayment should not be shorter than a maximum period of 8 years with a maximum grace period of 2 years in order to prevent a cash shortage in the cash flow of the financed projects.

With regard to the repayment conditions, it is suggested that a maximum period for repayment and grace be set up as a program-level guideline. In the course of loan approval for individual projects, an appropriate repayment condition for each project will be decided on the basis of the financial evaluation of the project. It will be unnecessary for the repayment period to set up different terms on working capital and on investment for fixed assets.

3.4 Debt/Equity Ratio

It should be reasonable to set up a debt/equity ratio in a range between 80/20 and 70/30.

4. Establishment of Testing Laboratory for Metalworking Industry as Common Service Facility (CSF)

Production of parts and components which meet the requirements of buyers in terms of quality should be essential for the modernization of metalworking industry in Indonesia. A large gap between the requirements on quality demanded by the assembly-type industry and production capability of sub-contractors is often observed at present. From such point of view, establishment of authorized and well-equipped testing laboratories which are eagerly desired by private companies is indispensable. It is also advisable that the laboratory shall play a role of technical consultancy center.

4.1 Activities of Metalworking Products Testing Laboratory

- (1) Testing and inspection
- (2) Technical consultancy and guidance
- (3) Technical and marketing information service

4.2 Institutional Set Up of Metalworking Product Testing Laboratory

In Indonesia, it is urgently needed to have the laboratories in Jakarta and Surabaya area, and will be needed in Semarang and Medan in the near future. It must be carefully studied on what the suitable institutional set-up is for these laboratories in order to have them effectively function. The followings are some possibilities to be considered.

- (1) To establish as branches of MIDC
- (2) To strengthen and supplement the Regional Industrial Institute (BPI)
- (3) To establish as an organization under semi-governmental operation

4.3 Toward Realization of Establishment of the Metalworking Products Testing Laboratory

There are several issues, particularly financial and institutional ones, yet to be examined and determined between government, industries and other relevant parties in Indonesia.

It is recommended to make a detailed feasibility study concerning the required testing equipment line-up, personnel requirement, institutional and financial arrangement including utilization of foreign aid fund.

5. Technical Assistance (TA) Related to the Implementation of the Program

5.1 Necessity and Role of TA

The objective of the proposed program is to lead all enterprises which will be financed by the program loan to successful operation by means of modernization of their technology and facility, providing them with institutional finance, TA and CSF.

The activities of the Implementing Agency in executing the program will involve the following major aspects:

- 1) Program promotion
- 2) Project identification and development
- 3) Project evaluation
- 4) Project implementation and supervision

The Implementing Agency has to render appropriate assistance and advice to proponents in due course from planning stage until operational stage of their projects. Thus, TA services separated from the institutional finance in terms of activities cannot easily reach to the goal of the program.

5.2 Employment of Outside Consultants

The wide range of technical assistance envisaged for the implementation of the program will require technical expertise in various fields, which may not be within the Agency's capability to provide. This will have to be sourced from both local and foreign experts outside the Agency.

It will be effective in performance of the consultancy services that the outside consultants will be organized as a group and attached to the Agency as a part of total framework of the execution system in the Agency.

The general role of the outside consultants will be to assist the Agency, as its extended staff, in the provision of technical assistance during the various phases of program implementation. This will include assistance in the collection and analysis of market information, organisation of project promotion seminars, analysis of production technology needs and sources of technology, and extension services to proponent firms.

6. Implementing Agency

6.1 Selection of Implementing Agency (Executing Body)

In order to achieve the aims of the proposed development program, it has been discussed that it is imperative to implement the program by packaging both institutional finance component and technical assistant component. In implementing this comprehensive program, the direct and indirect cooperation of relevant government authorities, industrial organizations and financial institutions are necessary, but among others, what is essentially needed is an implementing agency to assume initiative and responsibility in

executing this program. From technical and financial assistance viewpoints, either a technical ministry such as the Ministry of Industry or some other governmental agencies concerned mostly with technical assistance or a financial institution such as state banks can be the candidates for the implementing agency.

The study team has carefully conducted the field survey from these two viewpoints, and upon conferring time after time with the various parties concerned, has reached the conclusion that it is reasonable to select one or more of state-owned banks as the implementing agency. The reasons for it are as follows.

- 1) The major pillar upon which this development program rests is the institutional finance called "two step loan" or "program loan" provided for the medium and small industries.
- 2) According to the laws of Indonesia, general financing operation shall be made by financing institutions.
- 3) Considering that the main source of the fund for institutional finance will be met from a foreign fund(s), the necessary procedures and steps would be more smoothly carried out if a state-owned bank(s) is assigned as the implementing agency.

(1) State banks to be examined

- a) Bank Negara Indonesia 1946 (BNI'46)
- b) Bank Rakyat Indonesia (BRI)
- c) Bank Expor Impor Indonesia (BEII)
- d) Bank Bumi Daya (BBD)
- e) Bank Dagang Negara (BDN)
- f) Bank Pembangunan Indonesia (BAPINDO)

(2) Requirements for implementing agency (handling bank)

In view of the general characteristics of medium and small firm financing, the handling financial institutions must have the following functions.

- 1) It must have experience in industrial (manufacturing) finance and be familiar with conditions of industrial society.
- 2) It must be accustomed to handle long term development financing and be capable of directly or indirectly (by mutually cooperating

with other financial institutions) implementing short term commercial lending (follow-up financing after lending development funds).

- 3) It must be located close to the clients (the target medium and small-firms) so as to be able to maintain contact with their day to day operating activities and to offer face-to-face guidance and information. In other words, it must have an extensive branch network.
- 4) It must be able of allocating manpower to conduct firm's credibility investigation and project analysis for the proposed new program within the institution.
- 5) It must be able to provide technical assistance, particularly in project identification, implmentation and monitoring after lending with proponent firms.

(3) Overall evaluation

The above various indicies for evaluation are summarized as the following table. Prior to this evaluation, BRI was excluded from the list, since its major clients are quite different from the clients currently being studied.

OVERALL EVALUATION OF STATE BANKS AS AN IMPLEMENTING AGENCY
OF THIS PROGRAM

	BAPINDO	BNI'46	BDN	BBD	BEII
Long term loans to industry	1	2	3		
Experience with medium and small industries		1	2	2	
Branch network in major areas		1	2	2	
Bank managerial performance indices			2	2	1
After care finance		1	1	1	1
Manpower and administration of loan	1	2	3	3	

Note: The number indicates ranking in each item.

(4) Consideration to be taken in selection of implementing agency

There are advantages and disadvantages in appointing only one institution or a plurality of financial institutions as implementing agency. The advantage in having plural implementing agencies is that the principle of competition will work to the credit of the program by accelerating the promotion of lending to promising industries and thus speed up development. The advantage in having only one bank is that technical assistance which ought to be integrated with finance can be integrally implemented under centralized control under one bank. In case of plural agencies are assigned, it tends to hinder smooth promotion of this program because their assistance given under institutional finance would be separated from technical assistance.

This matter requires further review, but since the proposed promotion program, if materialized, would become Indonesia's new system, it is considered that the program would be more smoothly operated if only one bank is to be appointed as implementing agency to adopt a centralized control and assistance system at least during the initial program loan.

Involvement of a technical agency(-ies), however, in the part of the technical assistance is still worth for examination in the case that an

assigned bank(s) could not provide sufficient technical services to proponents inside of his organization. The Institute for Industrial Entrepreneurship newly established by MOI in participation of other agencies could function technical and managerial assistance services to be extended to individual projects under the program, as well as the promotion and monitoring of the program, provided that close coordinations are maintained with the appointed bank(s).

6.2 Overall Institutional Framework and Role of Ministry of Industry for the Proposed Program

Figure 1 illustrates an overall framework including relevant organizations and institutions for implementation of the proposed program. As shown in the figure, collaboration of relevant agencies such as MOI, MOF, BAPENAS, BKPM, industry associations, technical agencies and banks is indispensable. In such sense, although it is suggested in the preceeding paragraph that a state bank(s) which has TA division inside of the bank will be most workable as the implementation agency for the program, the role to be played by the Ministry of Industry as the governmental ministry responsible to development of industry in the country is important for the success of the program specifically by participation in the area of TA. In such case that MOI will be directly or indirectly involved in the program, the function, organization and workflow of the overall execution system shall be carefully examined in coming stage. Some of major functions of MOI in the program can be described as below:

(1) Project identification and feasibility study

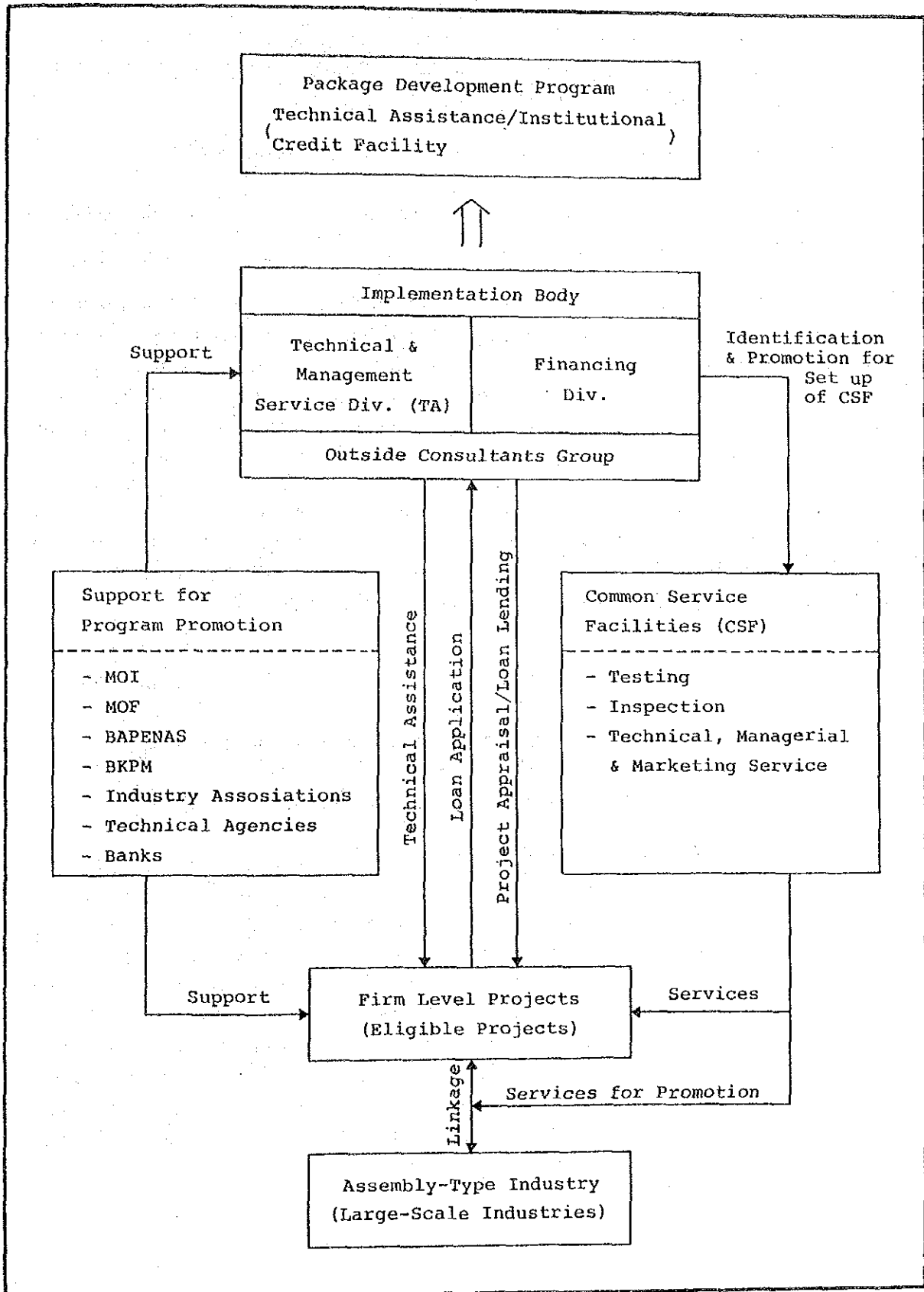
MOI has been in close contact with medium and small industries through its regional offices (KANWIL) and implementing various assistance programs. Identification of projects and conduct of feasibility studies (F/S) of sub-projects (expansion or new construction of factories) are important supporting functions of this program, which is a possible area to be covered by functions of MOI or its agency.

(2) Testing laboratory for metalworking industry

Establishment of Metalworking Product Testing Laboratory is necessary as Common Service Facilities (CSF) for development of the subsector. As institutional setup for this CSF, there will be possibilities in establishing directly under MOI, under private industrial association or in collaboration between government (MOI) and private (so called "third sector" approach). At any rate, there has to be a participation

by MOI directly or indirectly. There are still various factors to be carefully studied, in regard to facilities, manpower, budgeting of operational expenses, technology and sourcing of fund from government budget or private sector or foreign aid, which are proposed to be clarified in the further study.

Figure 1 OVERALL FRAMEWORK OF EXECUTION OF THE PROGRAM



VI. MEASUREMENT OF FUND REQUIREMENT

This section reviews the capital investment which may be needed for the linkage-type metalworking industries in the near future. The fund requirement is measured from the following two viewpoints.

- a) The amount of fund actually needed by the private firms.
- b) The potential fund requirement for the metalworking industries in Indonesia as a whole.

a) is the realistic amount of fund requirement obtained by questionnaire survey of 219 firms, and it represents the total requirement of existing firms who replied that they needed the fund for expansion and/or modernization of their facilities. Although it is hard to determine what proportion of this fund requirement will actually be realized as real demand for two step-loans, it means that at least this much fund requirement does actually exist.

Meanwhile, b) represents the potential total demand for fund obtained from the viewpoint of capital investment required for the metalworking industries if it is to achieve industrial development as targeted in REPELITA IV and other programs. Accordingly, a) may be regarded as being a part of b).

1. Tabulation of Fund Requirement Obtained by Means of Questionnaire Survey

The figures obtained from the questionnaires are listed in Table 4.

(1) Classification of the scale of firms and distribution of replies

According to the Ministry of Industry's classification, "the small-scale enterprises" are defined as those which satisfy the two conditions of (1) having the mechanical production facilities worth 70 million Rupiahs or less, and (2) capital per employee of 650 thousand Rupiahs. MOI does not have any precise definition with respect to "medium-scale" and "large-scale" firms so that it is not possible to classify the statistical data into small, medium and large industries. BI's definition is also only for the small-scale industry. For expedience, the questionnaires were tabulated here according to the classification by number of employees. The distribution of the number of replies to the questionnaire by the scale of firm is as follows.

DISTRIBUTION OF REPLIES TO QUESTIONNAIRES
BY FIRMS OF THE METALWORKING INDUSTRIES BY SIZE

Group of Company	No. of Answers (%)		Average employee per-company
I (19 employee or less)	75	(34.2)	10
II (20 to 99)	99	(45.2)	46
III (100 to 199)	24	(11.0)	137
IV (200 employees or more)	19	(8.7)	354
Employment size unknwn	2	(0.9)	-
Total	219	100.0	71

(2) Total investment

As summarized below, investment required for 121 companies in a total amounts to Rp.84 billion, or Rp.695 million per company.

The size of investment per company increases accordingly to the size of company.

The total capital investment above is deemed as the sum of funds for capital investment and working capital because the question was not made separately on the two capitals. Almost all firms scheduled to complete their investment by 1990, which on average, centers on May 1987. The figures below can be considered as the total required fund for five years.

INVESTMENT REQUIRED BY GROUP OF COMPANY SIZE

Group	I	II	III	IV	Total
No. of answer	55	53	6	7	121
Total investment (Rp. billion)	2.4	22.2	22.0	37.5	84.0
(US\$ million)	2.1	20.0	19.8	33.8	75.7
Per comapny (Rp. million)	43	403	3,667	5,357	695
(US\$ thousand)	39	363	3,303	4,826	626

(3) Required loan amount

Assuming the Debt/Equity Ratio of 70/30, the required loan amount for coming 5 years is calculated as 70% of the above total requirement, as listed below:

LOAN REQUIREMENTS BY GROUP OF COMPANY SIZE

Group	I	II	III	IV	Total
Total investment (Rp. million)	2,376	22,163	22,000	37,500	84,039
Loan requirement (Rp. million) ^{1/}	1,663	15,514	15,400	26,250	58,827
No. of company	55	53	6	7	121
Loan per company (Rp. million)	30	293	2,560	3,750	486

Note: ^{1/} Debt/Equity is assumed as 70/30 for all groups.

2. Potential Capital Demand Estimate

The potential capital demand in the near future for the linkage-type industry in whole Indonesia has been estimated in three different methods.

a) Estimate by work volume increase

Work volume for the linkage-type metalworking industry in Indonesia is firstly estimated on the assumption that the requirements for domestic production stemmed from localization and natural economic growth in the assembly-type industry sector will create an additional market for the linkage-type industry sector.

Secondly, the capital investment required for the linkage-type industry is computed on the assumption that such additional market shall be fulfilled by investment for installation of new or additional capacity.

b) Estimate by the questionnaire survey data

The questionnaire survey shows a capital requirement as much as Rp.84 billion for 219 companies including ones which do not have expansion plan in the near future. An average capital requirement per company has been computed as Rp.380 million, by which an estimated total number of companies in Indonesia is multiplied to obtain a total capital requirements for the whole country.

c) Estimate by the national macro-economic data

It is known that there is a correlation between the value-added and the fixed assets formation (investment) in the industry. Using the correlation, an estimation of the capital requirements for the metalworking industry sector is made.

The results of these three method of estimation are as follows:

a) Estimate by work volume increase

	(US\$ million)					
	1986	1987	1988	1989	1990	Total
1985 constant price	103.7	103.7	103.7	103.7	103.7	518.6
With 8% inflation	112.0	121.0	130.6	141.1	152.3	657.0

b) Estimate by the questionnaire survey data

	(US\$ million)					
	1986	1987	1988	1989	1990	Total
1985 constant price	179.6	179.6	179.6	179.6	179.6	898.0
With 8% inflation	194.0	209.5	226.3	244.4	264.0	1,138.2

c) Estimate by the national macro-economic data

	(US\$ million)					
	1986	1987	1988	1989	1990	Total
1985 constant price	159.0	159.0	159.0	159.0	159.0	795.0
With 8% inflation	171.7	185.5	200.3	216.3	233.6	1,007.4

Table 4 CAPITAL INVESTMENT REQUIRED BY 219 COMPANIES IN QUESTIONNAIRE SURVEY

Category Employees	I 19 and below	II 20-99	III 100-199	IV 200-299	Total
<u>Expansion plan</u>					
(1) Nos. of answers	75	99	24	19	217 ^{1/}
(2) Expansion plan (yes)	66	70	13	10	159
(3) (2)/(1) (%)	(88.0)	(70.7)	(54.2)	(52.6)	(73.3)
<u>Total investment</u>					
(4) Total capital required (MMRp.)	2,376	22,163	22,000	37,500	84,039
(5) Validity of answers (Companies)	55	53	6	7	121
(6) (4)/(5) (MMRp./Company)	(43)	(403)	(3,667)	(5,357)	(695)
<u>Self finance</u>					
(7) Self finance (MMRp.)	615	5,313	400	2,300	8,628
(8) Validity of answers	50	49	4	5	108
(9) (7)/(8) (MMRp./Company)	(12)	(108)	(100)	(460)	(80)
<u>Loan required</u>					
(10) Loan required (MMRp.)	1,111	14,675	1,600	3,200	20,586
(11) Validity of answers	51	50	5	5	111
(12) (10)/(11) (MMRp./Company)	(22)	(294)	(320)	(640)	(186)
<u>Equity/Debt Ratio</u>					
(13) (7)/(10)	36/64	27/73	20/80	42/58	30/70

Note: ^{1/} Of 219 answers (companies), two answers don't show number of employees.

Source: Questionnaire Survey Carried Out by JICA Team

VII. ESTIMATED BUDGET OF THE PROGRAM LOAN

- (1) The total amount of sub-loans to firm level projects and number of borrowing companies

The metalworking industry in Indonesia is expected to require investment in a range between 500 and 900 million U.S. dollars in the coming five years. This investment requirement will be met by government investment, private investment, investment from overseas in the form of joint-ventures, borrowing from various institutional loans, borrowing from state and private banks and the acceptance of foreign loans and aids.

Therefore, the portion to be shared by the program loan proposed in this Report cannot be exactly stated at this moment that no financing source is defined. The program loan aims at stimulating the Indonesian metalworking industry in the direction of modernization by means of selectively fostering grower-type companies as development models. The initial total amount of sub-loans should, therefore, be assumed based on the actual capital demand in a pipeline.

Loan requirement answered by 219 companies in the questionnaire survey is summarized as follows.

Group (No. of Employees)	Required Borrowing Amounts	
	(Rp. Million)	(US\$1,000)
I (upto 19)	1,663	1,498
II (20 - 99)	15,514	13,977
III (100 - 199)	15,400	13,874
IV (200 or more)	26,250	23,649
Total	58,827	52,997

Suppose Group IV is removed from the target group because of its large size, and also suppose that Rp.350 million (70% of the investment amount of Rp.500 million per sub-project) is required for each sub-project as an average owing to the need for fair large investment for modernization, the lending schedule for the coming five years can be calculated as shown in the table below. These finance requirements would be met by foreign funds, as well as domestic counterfunds.

LENDING SCHEDULE (SUBJECTS: CATEGORIES I, II AND III ONLY)

	No. of Borrowing Companies	Rp. Million	US\$1,000
1st Year	18	6,300	5,681
2nd Year	20	7,000	6,312
3rd Year	20	7,000	6,312
4th Year	19	6,650	5,996
5th Year	16	5,627	5,047
Total	93	32,577	29,348

Note: Assumed as sub-loans for Group I, II and III with an average lending amount per company of Rp.350 million, or US\$315.6 thousand.

(2) CFS and TA

The cost of Common Service Facilities is preliminarily estimated to be between US\$5.3 million and US\$7.6 million. Whether this cost will be financed from the frame of the program loan or met by other sources shall be determined only after the program's implementation has been decided.

Supposing that TA would be provided, the cost for outside consultants except costs for the implementing agency might be around US\$3.0 million.

3) Total budget for the development program

While many items of the total program budget are subject to future examination, a preliminary estimation is shown as below based on the above-described assumptions.

	US\$ Million
Sub-loans	29.4
Outside consultants	3.0
Common service facilities	7.6
Sub-total	40.0
Contingency (10%)	4.0
Total	44.0

VIII. ECONOMIC BENEFITS EXPECTED BY THE IMPLEMENTATION OF THE PROGRAM

The possible benefits of the development program for the linkage-type metalworking industry in Indonesia as a whole are evaluated in this Report in terms of employment opportunities, the saving of foreign currency and the indirect benefits.

(1) Increment of employment opportunities

The employment structure in Indonesia is: 58% in the agricultural sector, 12% in the industrial sector and 30% in the service sector (World Bank, 1981). As the Fourth Five-Year Development Plan (REPELITA IV) requires new employment of 1,864,000 people each year, it is anticipated that the industrial sector, with the highest growth rate of 9.5%, will provide most of these new employment opportunities. As REPELITA IV clearly states "the metalworking industry and the machine industry are the important industries for the expansion of productive employment in the industrial sector", the linkage-type metalworking industry should play an important role as its employment opportunities creation in accordance with the modernization, as well as the expansion, of its production facilities.

(2) Saving of foreign currency

Since the present program is a promotion program for the import substitution industry with the aim of introducing the domestic purchase of intermediate products (metal parts, etc.) which have so far been imported, it will have a direct effect on the saving of foreign currency. With the purchase of machinery from abroad as part of the investment in plant and equipment and the import of capital goods, however, some raw materials and quasi-materials will obviously increase. As a result, the saving of foreign currency under this program may be low in the short-term but will definitely be beneficial in the long-term viewpoint.

(3) Indirect benefits generated by the program

REPELITA VI emphasises the expansion of the linkages between large, medium and small industries. As a result, it gives priority to those measures converting weak, small size companies into modern, medium size companies. In this regard, REPELITA IV tries to enforce an economic policy whereby private companies are fostered, together with the general expansion of the industrial base, instead of a social policy simply aiming at "protecting the weak".

The present Survey has already confirmed the existence of medium-and small-size machine/metal processing companies with good prospects to become modern, medium standing companies. Therefore, it can be expected that the implementation of the present program will stimulate the fostering of private industrial capital and that economic development in Indonesia can be achieved by means of actively utilising the vigorousness of the private sector in the national efforts for industrial development.

RECOMMENDATIONS

[RECOMMENDATIONS]

I. GENERAL ASPECTS FOR METALWORKING INDUSTRY IN INDONESIA

- (1) Establishment of new facilities for strengthen linkage between machine assembly industry mainly comprising large-scale enterprises and suppliers of components and parts consisting of small- and medium-scale enterprises is recommendable. For this end it is recommended to set up a definition of medium-scale enterprises.
- (2) The recommended facilities shall provide both a testing laboratory for metalworking products and a function of filling up technical and information gaps between the two groups.
- (3) It is advisable to provide industries which are obliged to utilize domestic components in line with the deletion program with some incentives in order to promote attainment of the deletion program.

Reduction of and exemption from the income tax and the value-added tax are considerable as an incentive. Besides, exemption from import tax and duties for importable components to those enterprises which have attained the target of the deletion program is also advisable.

- (4) The above means of exemption from import tax and duties aim at a compensation of cost penalty caused by the utilization of domestic cally manufactured components.
- (5) The deletion program stipulates no obligation to suppliers of components. This means that buyers are obliged to use such components even if they are below the industrial standards in terms of quality. It is recommendable that *submission of an authorized report on testing results is to be obligation for the suppliers when the buyers would request it.*
- (6) The reasons why the domestic metalworking products tend to be high in cost when compared with imported ones are a) high raw material cost, b) high import tax and duties on imported machine and materials, c) high interest rate and d) low production efficiency caused by superannuated facilities and insufficient management skill.

These facts indicate that purchase of materials at economical costs, provision of special credit program and modernization of facilities and technology will be able to reduce such cost penalty to a great extent.

- (7) Special credit facility for the investors which were categorized in KIB II to IV (loan amount: Rp.75 million to Rp.1,500 million) was abolished by the financial sector reform in June, 1983. In order to stimulate the investment made by the small- and medium-scale industry, introduction of a special financing program having the loan size larger than Rp.75 million is vital for modernization of production facility.
- (8) First step to be taken for the development of the linkage-type metalworking industry is to be production of components which are marketable to the public sectors and the assembly-type industries in view of stable market, and which can be produced with less automated machinery in view of present technology level as well as job opportunity creation.

II. DEVELOPMENT PROGRAM FOR METALWORKING INDUSTRY

- (1) A package development program is recommended for the modernization of the linkage-type metalworking industry in Indonesia. The proposed program has tools and functions of a special credit facility (program loan), Technical Assistance (TA) and Common Service Facilities (CSF) in a package.

The basic concept of the comprehensive development program proposed above can be summarized as follows:

- a) The objective of the program shall be to expand modernized small- and medium-scale metalworking industry, particularly the linkage-type industry.
 - b) To meet the above objective, a program loan will be newly enacted to provide soft-term investment credit for those projects.
 - c) In the beginning, the number of companies to be subject to fostering efforts should be limited in order that the success of the model companies can be secured with intensive assistance for their development. With their success, the total loan amount and the number of companies as well as sub-sectors shall be expanded.
 - d) The development program is to be a package program combining the provision of a special loan program and the provision of TA and CSF.
- (2) The following recommendations shall be taken into account for justification of eligible borrowers for the proposed program loan in the course of the program formulation.
 - a) Eligible subsector is to be the linkage-type metalworking industry. Those companies which have potentiality to become or grow up to one of the linkage-type industries, even though no link is presently made to the assembly-type industries, shall be also eligible, since the objective of the program is not only to foster the linkage-type industry for the immediate needs but also foster the candidates to be grown for the future expansion.
 - b) As for eligibility of ownership, companies owned by Indonesian citizen shall be the main target of the program loan. Nevertheless, it is recommended to consider joint ventures with

foreign companies also as eligible companies, as long as they satisfy the conditions set in terms of size of company and other requirements because such joint ventures will play a great role in modernization of the technology.

- c) The investment for the establishment of new facilities but also for the expansion of existing facilities should be eligible, provided that those projects be based on modern technology and facilities. Loan applications for only working capital which do not involve investment to production facilities should not be eligible.
- d) Eligibility for company size and credit ceiling will be carefully examined in the course of final formulation of the program.

The following is one of the possible criteria examined in due consideration of the conditions applied to similar program loans as well as the objective of the proposed program.

Existing assets:	max. Rp.1,000 to 2,000 million
Credit limits:	max. Rp. 500 to 1,000 million
	min. Rp. 15 million

- (3) In assessment of individual projects for loan approval, profitability of each project shall be evaluated on the basis of a financial projection. Those projects which do not satisfy a pre-determined Internal Rate of Return (IRR) should be rejected from the loan in the case that the projects will not be able to be improved by any re-planning or adjustment.
- (4) For the purpose of grading up metalworking products in terms of quality, construction of Common Service Facilities (CSF) which have a testing laboratory is recommended for success of the proposed program and for the long-term development of the said industry.
- (5) It is advisable for the CSF to have promotion activities on the close linkage between the assembly-type and the linkage-type industries. Participation of private industry associations in operation of CSF shall be examined because the associations will be able to activate the performance of CSF from users' side.
- (6) First the all, an execution body shall be selected or formulated for realization of the proposed package program. Assignment of a state bank(s) as the execution body is preferable because the fund management becomes one of the most important function for the program.

- (7) Function of Technical Assistance (TA) shall be attached under the execution body. TA division will assist proponent projects over preparation, implementation and operation from technical, marketing and managerial points of view. If the appointed banks have no function or capability to undertake TA, another agency shall be appointed for the implementation of TA program, provided that it has close coordinations with the appointed bank(s). The Institute for Industrial Entrepreneurship should be the candidate for the implementation agency of the TA program.
- (8) It is recommendable for TA to employ outside consultants comprising local and foreign consultants. The outside consultants work as a group under the management of the execution body.
- (9) The Ministry of Industry (MOI) shall support the implementation of the package development program especially in the area of the TA. Concrete measure for participation of MOI is one of the subjects to be discussed in Indonesian Government.
- (10) Understandings and cooperation of relevant organizations such as MOI, MOF, BAPPENAS, BKPM, BI, Banks, Industry Associations are indispensable for the success of the proposed program.
- (11) For the implementation of the proposed program, it is recommended to take the following steps.
 - 1) Appointment of the implementation agency(ies) and the preparation of an implementation program based on the proposed concept.
 - 2) Conducting a detailed feasibility study for the establishment of the proposed Common Service Facilities (i.e., Metalworking Product Testing Laboratory and Technical Service Center).

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