Industry Assistance Center, would be suitable. In addition to the administrative bureau, a promotion committee would be formed from representatives of various related organizations, groups, etc. to provide cooperation and advice in operations. The promotion committee would be comprised mostly of representatives of the MIAP and the die user industries. Desirably, from the government organizations, there would be participation from the MIRDC, BOI, BSMBD, and BPS. Further, the promotion committee would be important as a means for introducing paticipating companies to the users. Further, it desirably would serve as the forerunner of a committee for promotion of a suitable modern factory recommendation system, mentioned later. Also, it is necessary that it be comprised with as common a basis as with the organization of the committee comprised for the implementation of the Metals and Engineering Industries National Action Plan.

b) Schedule

It is desirable that projects which are extremely important for the start of this development program be started immediately.

(2) Project for Suitable Modern Die Making Factory Recommendation System

1) Outline of project

a) Outline

Based on applications from companies desiring recommendation, recommendation as "suitable modern die making factories" would be given to factories which meet certain technical and managerial requirements. Recommended factories would be provided support in introducing them to domestic and overseas users. The main goal of the project would be to induce numerous companies to make efforts in technical and managerial areas to obtain recommendation so as to obtain the benefits of the system.

The project is envisioned as being implemented at the stage where the advisory project for upgrading of technology and product quality has achieved a certain degree of success and where a core of modern die making companies has been developed and die companies have been increasing to cope with the increasing demand of die.

b) Requirements of project

To achieve the goals of this project, it is considered necessary that at least the following requirements be met:

1. Implementation in advance of a technical guidance program for companies desiring recommendation, such as the advisory project for upgrading of technology and product quality

2. Establishment of a system for introducing recommended factories to domestic or overseas users

3. Clarification of incentives such as easing of evaluation standards in institutional financing and preferential treatment for capital investment for the recommended factories.

4. In setting the recommendation standards, a project promotion committee would be established based on the promotion committee for the advisory project for upgrading of technology and product quality, which is comprised of representatives of the die making industry, mostly the die user industries, and suitable recommendation

standards would be set under the same. At that time, it is necessary that 1) coordination be secured with the aim of advisory project for upgrading of technology and product quality and 2) the wishes of the users be reflected.

c) Reference matters in implementation of project

Reference matters for implementation of project are as follows:

1. Thinking with regard to recommendation standards: The most important requirement for the recommendation standards is that they be set so as to enable die companies which have cleared the standards to be judged by user industries to be suitable die companies. In this sense, in the setting of the recommendation standards, it is important that the wishes of the user industries be fully reflected. The next most important requirement is the objectiveness of the examinations. For the examinations to be performed objectively. the recommendation standards must be made clear. Die fabrication includes considerable elements of experience, so it the recommendation standards are to be made clear, they have to be based on the experience of the current level of industry. There is the danger that the recommendation standards which can be secured would be low at the underdeveloped stage of the industry. However, it is necessary to clarify the fact that the recommended factories are factories which are recommended as a result of examination based on certain set standards and that recommended factories do not equal factories for which it is guaranteed that a high level of dies can be fabricated without defect. That is, whether or not a user can do satisfactory business with a recommended factory is a matter of a nature to be judged at the responsibility of the individual users. The recommendation system should be considered as providing the basis for judgement through its standards.

   From this viewpoint, judging from the current state of the Philippines, the recommendation standards which can be initially set would be considerably limited. As the level of the industry as a whole is raised, it would be necessary to reevaluate the recommendation standards.

2. Classification of recommendation: For the time being, recommendation would desirably be offered for only fabrication of general press dies (for example, a "General Press Die Recommended Factory") and recommendation given to precision dies etc. in the future as another classification. Further, if technically possible, it is estimated that there is large demand for recommendation for the fabrication of plastic forming molds.

   Concerning the classifications, classification, if just recognizing current levels of technology, would not serve to stimulate companies to aim at a higher level. The classifications must show whether or not standards are met and give companies which do not meet them a chance for further effort.

3. Recommendation standards: As recommendation standards, considerable may be given to 1) the quality of the dies, 2) the facilities owned, 3) the number of engineers and suitable technicians, and 4) the managerial control system. Of these, what could be the clearest standard would be the "number of engineers and technicians". On the other hand, the ability to use the "quality of dies" as a standard requires that the evaluation of users be obtained. This requires that the users 1) be making products of a high quality as aimed at by the recommendation system, 2) engage in statistical quality control for products made using dies, and 3) are willing to provide the same. Certain difficulties remain in application in the Philippines at this time. Rather in the present stage, it is considered appropriate to aim at that dies can accurately be processed and assembled according to the design and that the process (7), (8) and (9) indicated in figure III-3-1 can be satisfied. The standard for "facilities owned" which are required is not necessarily fixed. Further, it is possible to contract out some work and make use of

common service facilities, so if this is added as a standard, it would result in just defining the minimum necessary facilities and would not be effective to the original goal of the system of promoting modernization of facilities.

Regarding the "managerial control system", difficulties remain in using this as an objective standard. It is necessary that this standard be set with full consideration of the above point and consideration of the needs of the user industries and the state of the die making industry. Further, the final aims of the standard would be as follows:

a. That the fabrication of dies which enable running, mass, stable production of products satisfying product design and quality specifications be possible.
b. That the minimum necessary production facilities for die fabrication (processing, heat treatment, surface treatment, inspection, testing, etc.) be prepared or that there be cooperating factories with long term contracts.
c. That there be a system wherein persons qualified in die fabrication be permanently stationed in the factory organizations and be above to provide guidance and supervision in technical and managerial areas for the fabrication processes (including cooperating factories) as a whole.
d. That managerial control systems be constructed by managers with sufficient knowledge and experience in die fabrication.

Therefore, the recommendation of factories would not be governed by the size of the operations or the age of the production facilities. Rather, it would certify that production of reliable dies of a high quality is possible using the long experience and the reliable technical level of a factory.

4. Die engineer and technician certification system: As already stated, the clearest standard which could be used as a standard for an recommendation system would be that a certain number of qualified engineers and technicians were present. Below, the content of a qualification certification system and examples of the same are given.

   Certification would be given to qualifications with the aim of stimulating the interest of people engaged in die fabrication to acquire technology and skills, raising the evaluation of society in general of the results, upgrading technology, skills, and positions, and contributing to the development of the die making industry. Certification would also be given to managerial technology and skills relating to managerial and supervisory jobs on the production field. A qualification certification committee including persons with academic experience and practical experience would be established. The committee would evaluate the level of technology and skills and would consider whether or not the minimum necessary expert knowledge was possessed in certifying qualifications.

   The level of skill would be certified by having workers actually perform the work and by certifying the degree of skill then displayed. For the minimum necessary expert knowledge, certification would be given as to the ability to make correct judgement and the knowledge necessary for execution of work.

   The requirements for certification of qualification, by way of reference, are summarized below:

   a. As engineers, persons having expert knowledge in forming machinery, processing technology, processing materials, types and structures of dies, etc. and having sufficient experience, as practical skills, in the design, fabrication, and testing of dies.
   b. As technicians, persons having sufficient practical experience in forming, machining (including hand finishing), inspection and measurement, die fabrication, testing etc.

and having the ability to make correct judgements as to work.

2) Recommendation on implementation

a) Implementing system

1. Promotion of plan: Desirably the BOI and DOST (MIRDC) would handle the planning and proposals. In particular, the BOI would set the basic plans and matters concerning incentives, while the MIRDC would plan the technical areas.

2. Implementation and coordination: The administrative bureau for implementation and the promotion committee would be the upgraded administrative bureau and promotion committee for the advisory projects for upgrading of technology and product quality. Under the promotion committee, a technical committee would be established to handle technical matters. Recommendation standards would be drafted by the administrative bureau, studied by the technical committee, and determined by the promotion committee. It is considered that it would be effective for the examination for recommendation to be handled by the technical committee.

b) Schedule

This recommendation system would become effective when 1) a core of modernized die manufacturers was formed and 2) domestic orders began to increase. It would be best to begin it after the effects of the previously mentioned advisory project for upgrading of technology and product quality began to appear.

(3) Project for Establishment of Metal Engineering Industrial Estate

1) Outline of Project

a) Outline

Die making factories are generally not suited for large scale operations. Therefore, if demand for dies increases in the future, numerous die factories would become necessary. Judging from the current financial state of the Philippines, one cannot expect that the power supply, communications facilities, roads, etc. will be quickly established over a wide area. Therefore, it is necessary, for a time, to concentrate factories, either newly established in the future or else moved, in a specific area and speedily establish the infrastructure of that area. In that case, it would be further convenient if support sectors necessary for metal engineering industries, such as heat treatment, and a technical training center be established in the estates or nearby.

The Philippines began development of industrial estates in the metropolitan region, such as in Cavite, in the 1980s to meet with the demand for industrial estates in the metropolitan area. There are about 24 to 25 estates developed or in planning and the occupancy rate is about 60 to 100 percent.

In 1989, the government prepared guidelines on industrial estates so as to prevent confused development of industrial estates and has been offering incentives for the development of industrial estates by the private sector.

In general, development of industrial estates tends to be in industrial regions or areas nearby the metropolitan regions which are advantageous in terms of the labor force, market, infrastructure, etc. and which enable demand to be met. In particular, for an industrial estate for the metal engineering industry, which is strongly subcontracting in nature, it is essential that consideration be given to selecting a location in an area with a

relatively large number of user industries, to preparing an environment facilitating contacts with the user industries and enabling exchange of technology and information, and to enabling the occupant companies to establish expert technology on their own and move toward greater advancement and specialization. Further, numerous technical and economic advantages would have to be provided such as the ability to make use of improved infrastructure (roads, communications, and services), the ability to make joint use, as common service facilities, of sophisticated facilities (precision measurement equipment etc.) which are necessary for production but which be uneconomical for companies to install on their own, the ability to easily secure safety in terms of security, the possibility of joint programs in the estate such as joint purchasing of the main materials and supplementary materials required in the estate, and the collection and dissemination of information, and considerations for future factory expansion through securing surplus space.

Most of the existing metal engineering factories are small spacewise and many are considering movement. From this viewpoint, it is expected that there is relatively large demand even now for an industrial estate.

The project would include the following:

1. Establishment of an industrial estate management company, formation of the industrial estate, and activities for attracting companies etc.
2. Establishment of power supply facilities, communication facilities, and roads
3. Attraction of the supporting service companies and service facilities to inside the estate
4. Preparation of financial package for general companies locating in the estate

b) Requirements of project

For the goals of the project to be achieved, it is considered necessary that at least the following requirements will have to be met:

1. Running of a sufficient feasibility study
2. Attention given, in siting decisions, to the closeness of user companies of the die making industry
3. Firm establishment of the infrastructure and attraction of supporting service companies. If it is difficult to attract supporting service companies, it would be necessary to add the same as facilities for joint use.

4. Preparation of package of incentives for occupant companies

c) Reference matters in implementation of project

1. Functions of industrial estate management company
   a. Management of infrastructure in estate
   b. Management of joint enterprises in estate
   c. Management of outside contacts in management of estate
   d. Operation and management of common service facilities

2. Requirements for occupant companies
   a. Small and medium sized companies with a desire to modernize
   b. Precision machining, shaping of materials, heat treatment, surface treatment (metal plating, vapor deposition, etc.) sectors, metal engineering sectors using dies and molds, and die/mold making sector

3. Requirements for site
   a. Vicinity of industrial region with relatively large number of user industries

b. The securing of sufficient space for each occupant company and the potential for future expansion
c. Possibility of establishment of infrastructure

4. Common service facilities
a. Machinery repair factories, precision processing facilities, facilities for analysis of materials, facilities for precision measurement
b. Heat treatment and surface treatment facilities (in the case where there are no such occupant companies)
c. Product display center, education and training centers, information and reference center, service and pollution prevention facilities

5. Incentives
a. Abatement of import duties of machinery, equipment, and raw materials for occupant companies
b. Application of special depreciation system
c. Easing of examination standards in institutional financing
d. Application of low interest hire-purchase or leasing system

6. Layout example
An example of layout based on specifications shown in Table III-6-3 is shown in Fig. III-6-1.

2) Recommendations on implementation

a) Implementation system

1. Promotion of plan: It is desirable that BOI draw up a plan and present it.

2. Implementation: An industrial estate management firm should be established to take charge of implementation and operation including drawing up of business plans and implementation of feasibility studies.

b) Schedule

Work should be started when demand for dies rises and the number of die making firms begins to increase. Because the preparation stage takes time, it is desirable to start preparations and consideration as soon as possible.

(4) Establishment of Die Making Industry Assistance Center

1) Outline of project

a) Outline

As seen in the already mentioned projects, some organization is necessary to provide technical guidance and assistance at different stages of the development of the die making industry. The functions required by the Center would change depending on the degree of development of the die making industry. At the initial stage, it would be required to teach basic technology to the engineers and technicians already working in the die making industry and spread awareness of the current stage of the die making industry of the advanced overseas nations. When demand for dies then increase and numerous die companies begin production, the organization would have to provide advice and technical guidance on various problems which occurred in the process of production. Further, at the stage where companies acquire a certain degree of technical expertise, important themes would be tackling new technology and research. The Center would serve as a

technical assistance organization for the die making industry whose functions would change in accordance with changes in the stage of development of the die making industry in the Philippines.

To enable the Center to function effectively, the Center would have to perform the following at the initial stage of development:

1. Hold seminars and workshops on technology and production control for upgrading die technology

2. Training in operation of machinery and equipment not yet owned by many general companies, but which would desirably be introduced in the near future for modernization, leasing out time, and guidance in the same (guided processing)

3. Service for use of machinery and equipment which general companies cannot hope to install at the present stage and in the near future due to economic reasons, but which have to use to improve the die precision and strength and increase cost competitiveness, specifically, facilities which are infrequently used by individual companies or which companies cannot acquire alone due to their high costs.

4. Services such as heat treatment, surface treatment, and other supporting technical service facilities and testing and inspection facilities which are difficult to provide on a private basis

Further, along with the development of the die making industry, the following would become necessary:

1. Greater sophistication of facilities
2. Conversion of machinery and equipment which has come into general use successively to training use, use for time rental, and use for guidance (guided processing)
3. Conversion of supporting service facilities and testing and inspection facilities to use for training along with intallation of such equipment in the private sector
4. Strengthening of consulting services

Entrenchment of the technology introduced from overseas into the local industry and strengthening of the R&D function for new technology will also be future themes.

b) Requirements of project

To achieve the goals of the project, it is considered that at least the following requirements be met:

1. Establishment of a system enabling the needs of the die making industry to be met at all times, specifically, the ability to deal with changes in function as mentioned earlier.
2. Establishment of a system enabling not only initial investment but also operating expenses to be sufficiently secured
3. Sufficient maintenance of machinery and equipment, with suitable replenishment of spare parts, materials, etc.
4. Training of a corps of guidance personnel enabling the demands of the die making industry to be met. Toward this end, it will be important to transfer technology to the support team in the "advisory project for upgrading technology and product quality". When the domestic guidance staff is insufficient, outside guidance personnel would be employed to make up for this.
5. Land suitable for use for training, guided processing, etc.
6. Suspension of any services which the private sector can increasingly handle and where competition has occurred

c) Reference matter in implementation of project

1. Division of roles with existing technical guidance and training organizations: The Center is intended to 1) transfer practical technology rooted in basic die technology (see Chapter 3), 2) provide technical training in machining operations for die making, and 3) provide common service facilities. Therefore, compared with the training in the NMYC and CITC, the training is more specialized than the training in general machining operations provided by these organizations. Further, it differs in that it is training of persons already able to operate general use machinery. The goals overlap much of those of the technical guidance in machining currently aimed at by the MIRDC, it may be said. If just the existing areas of the MIRDC were improve, then there is a great danger of problems occurring in meeting the requirements for the project mentioned earlier (see Chapter 3). Therefore, as indicated in recommendation on implementing system, in operation, it is desirable to make the Center a separate organization from the MIRDC or an organization attached to the MIRDC.

2. Machinery and equipment:
   In considering machinery and equipment, it is necessary to pay attention to the following points in view of the functions of this assistance center stated above:
   a. For the time being, medium-sized or smaller dies should be contemplated. No consideration should be given to large-sized dies.
   b. Installation of general-purpose machine tools and other machines which individual firms already own, or machinery and equipment already owned by study and technological guidance organizations and intended for the metal and machinery industry in general should be avoided as far as possible. Main components should be special equipment necessary for die making in the philippines in the future. However, installation of some general-purpose equipment which will become necessary during the development process will be inevitable. Examples of the machinery and equipment deemed necessary based on the about philosophy are shown in Table III-6-4.

3. Layout example:
   A layout example based on the above-stated installation of machinery and equipment is shown in Fig. III-6-2.

4. Estimated funds required:
   Based on the insallation of machinery and equipment and the layout example, it is estimated that approximately US$7.05 million (including US$5.25 million for machinery and equipment and US$1.8 million for construction of buildings) would be required. Details of the estimate are shown in Table III-6-5.

2) Recommendation on implementation

a) Implementing system

1. Promotion of plans: Desirably the DOST (MIRDC) would handle the planning and proposals.
2. Operation of Center: As mentioned earlier, the functions of the Center resemble the current functions of the MIRDC to a considerable extent, but there are problems in operation in the existing organization of the MIRDC as follows:

a. The functions supposed to be handled by the MIRDC extend over all fields of machinery and metals and are too broad, so the organization is too large to provide concentrated services to specific fields such as with the Center. It is difficult to expect the MIRDC to be able to provide finely tuned services.
b. Regarding upgrading of facilities, the facilities of the MIRDC are too general in purpose and it would be difficult to change to a layout of facilities specifically for dies.

c. The Center would stress the ability to support industry, i.e., to provide technical guidance, guided processing services, and common service facilities, rather than an R&D function, which is the basic function of the MIRDC.

From this viewpoint, it is desirable that the Center be an independent one which has sufficient facilities, decides on its own policies of operation, and provides practical services.

On the other hand, the MIRDC 1) has technical staff with certain experience, 2) already has installed general use machinery, and 3) is operated as a public corporation. Considering the fact that it is independent to a certain extent in finances, it is considered that the Center could be started as attached to the MIRDC and later could be made independent in the future as necessary. However, it would be necessary that the Center be basically independent in financial management and that an operating committee be formed which can reflect in the operation the users, i.e., the die making industry, and the industries using dies.

3. Training of corps of guidance personnel: Die technology, as mentioned earlier (Chapter 3), includes not only die making technology, but also basic technology including technology on materials and molding machinery. In addition, it depends, in both design and processing, to a large extent on experience in addition to technical theory. This training of guidance personnel would most effectively be performed through participation in the support team in the advisory project for upgrading technology and product quality.

b) Schedule

It would be desirable to quickly establish the Center, at the stage where many die using companies begin to look for suitable die companies, so as to function to induce the development of the die making industry. However, it is also necessary to train a suitable corps of guidance personnel. On the other hand, several steps of study and arrangements for agreement or authorization of related organizations would be necessary before implementation. Therefore, at the very least, it would be desirable to immediately start preparatory work.

(5) Promotion of Standardization for Dies

1) Outline of project

a) Outline

As already mentioned (see Chapter 3, 3-3), the industrial standards for dies in the Philippines include only standards considered necessary for the current stage of development. Therefore, what would be important in the future would be how these standards are actually applied in the industry. That is, it would be necessary to inform manufacturers and users of the technical and economic advantages of the use of standardized products, the ability to mass produce rather than produce single products, the interchangeability of component parts of dies, the ease of die maintenance, the rationalization of die preparations, the safety in work, and the stable quality of the dies. In particular, it would be necessary to promote the production, sale, and use of standardized products through the MIAP etc.

b) Requirements of project

Considered particularly necessary for standardization in the target field would be establishment of a system of publicizing standards and inspection.

1. There are limits to what can be done in publicizing standards just relying on the current budget and organization of the BPS. It is necessary to realize that publicity is an important element in improving quality and for the industry and user industries to tackle them positively. Therefore, it is necessary to formulate a program of publicity making use of industry journals, the publicity through the advisory project for upgrading of technology and product quality, mentioned earlier, etc.
2. A project for establishment of an inspection system is currently underway by the BPS, but still is not in the implementation stage. The industry and other organizations recognize the need for this and are providing backup. It is necessary for the BPS to clarify the reasons why the project has not yet be implemented and to request the necessary backup from related organizations.

2) Recommendation on implementation

a) Implementing system

The BPS would organize a committee, separate from the TC, for publicizing standards with the support of the MIRDC, MIAP, and the users, i.e., the parts processing and assembly industries so as to formulate and implement a program for publicity. The budget and organization of the BPS alone would be insufficient and it would be necessary to make use of the PR capabilities of the various participating organizations.

b) Implementation

It is recommended that the BPS directly tackle the formulation of the schedule for this project.

6-3 Development Program of Parts Processing and Machinery Assembly Industries

— Recommendation for Promotion of Exports of Metalworked Parts

1) Outline of project

a) Outline

It is proposed that stress be given to the implementation of the program for production of automobiles and home electric appliances now underway, in particular exports of metalworked parts.

b) Requirements of project

There is the danger of the incentives and preferential treatment resulting, as in the past, in creating an inefficient industry lacking international competitiveness. To avoid this, the following would be necessary:

1. Limitation of these incentives to restrictions and preferential treatment corresponding to the cost penalties which arise to the small size of the market and, when the cost penalties are seen to be reduced to the expansion of the market, the reduction of these measures
2. To make these measures possible, establishment by the government of a system for monitoring the economic effect and social costs of the implementation of the program.

c) Reference matters in implementation of project

It would be desirable, in particular, to give consideration to increasing the effective

of the project by the following:

1. Recognizing the counting of the amount of exports of metalworked parts exported by companies producing parts for automobile and home electric appliances and the assembly industries as part of the localization rate of these companies so as to increase interest in exports and pursue the economy of scale. Therefore, the rate of localization could exceed 100 percent. Further, in calculating the rate of localization, it would be necessary to study the allowance of the formation of corporate groups and of calculating rates within groups.
2. Encouragement of establishment of a parts center and procurement of parts for overseas use from the Philippines by, in addition to the current incentives, 1) improvement of communication facilities, 2) streamlining of export procedures, and other improvements of the environment.
3. Encouragement of domestic production of parts by use of incentives designed for different stages when the localization rate exceeds target values first sought. Consideration must be given so that the incentives be compatible with existing export incentives.

Regarding the recommendations, see Chapter 4, 4-4 (2).

2) Recommendation on implementation

Immediate implementation is recommended.

6-4 Activities for Promotion of Tie-ups with Overseas Die Companies

1) Outline of project

a) Outline

This program would include two steps: 1) formation of an organization serving as the implementing authority of the program and 2) sustained implementation of activities.

1. Formation of implementing authority of program
   The MIAP would serve as the administrative bureau and would organize a liaison group comprised of companies desiring registration on the list of companies desiring tie-ups. A promotion committee would be organized from representatives of the liaison group, representatives of user industries, and related government organizations.
2. Outline of activities
   a. Preparation of list of companies desiring tie-ups
      The list would carry the following information for each company:
      - Name of company
      - Name of president
      - Address, telephone number, facsimile number, and telex number
      - Date of establishment
      - Form of enterprise (organization as company etc.)
      - Industry (distinction as to dies for press use, die casting use, forging, or casting)
      - Capital
      - Number of employees
      - Production, shipment, and exports
      - Features (field of specialization, main technology, etc.)
      - Others (registration with BOI, qualifications of company, main clients, etc.) It would also be necessary to add information as to participation in the advisory project for upgrading of technology and product quality, assessment in recommendation system, etc.
   b. Preparation of a data base of the die making industry, based on information

regarding the equipment owned by the domestic die companies, production capacities (quantitative and technical), past record of orders received, etc., and obtaining a grasp of the industrial structure. Toward this end, construction of a system for reports of the information necessary for preparation of the data base from the industries and companies to the government organizations in charge on a periodic basis.

c. Organization of a continuous liaison council and information exchange council with the user industries and establishment of a system for obtaining assistance from the users in collection of various types of information
d. Organized activities for visits to promising overseas companies based on introductions from the foreign affiliates in user industries and promotion of greater personal relations through the same
e. Continuous dispatch of trainees from selected companies and development of personal relations through the same
f. Dispatch of investment promotion mission: Effort would be made to have companies seeking tieups to participate in missions together with related government parties so as to promote investment. Even if companies could not participate directly, a list of companies desiring tieups could be brought along and use for positive supply of information to the industries of the other countries. Note that in either case, it would be effective if cooperation could be obtained from parent companies in dispatching instructors for holding seminars at the mission sites, through foreign affiliated users operating in the die related fields in the Philippines.
g. Approaches to as many investment promotion organizations in other countries as possible and requests for a matching service based on the lists of registered companies. By way of note, in the case of Japan, if JETRO (Tokyo headquarters or JETRO Manila Center) is contacted, it could offer a matching service with companies on the list of potential investors compiled by JETRO (companies desiring tie-ups with foreign companies).

2) Recommendation on implementation

a) Implementing system

It is desirable that the MIAP serve as the administrative bureau for the activities. However, the MIAP is still too weak organizationally for sustained activities. The following system of support would be necessary to strengthen the MIAP.

1. Support from the BOI, BETP, CITEM, and the foreign legations of the Philippines in contacts with overseas organizations
2. Support from user industries in collection of information and, for this, organization of a group for continuous exchange of information and activities for assisting receipt of orders from the domestic sector.

b) Schedule

The liaison council should be organized and preparations commenced when the number of candidate companies increase through the advisory project for upgrading of technology and product quality.

Table III-6-1: Objectives and Development Programs for the Die Making Industry

Industry	Sub-sector issues	Effective measures	Development projects: Establishment/ assignment of government agency for industry policies planning/ monitoring	Advisory project for upgrading technology and product quality	Suitable modern die-making factory recommendation system	Establishment of industrial estate for metal engineering industry	Establishment of die making industry assistance center	Promotion of die/mold related standardization	Recommendation on the promotion of exports of metal worked parts	Activities for the promotion of tie-ups with die-making firms overseas
		Schedule	A**	A**	C	B	B**	C	A	C
Metals and machinery industries overall	(1) Strengthening of sectoral approach	- Establishment of basic sector policy and strengthening of monitoring system	×						×	
	(2) Expansion of financing programs for facility modernization	1. Provision of complementary measures for credit		×	×	×				
		2. Establishment of loans for modernization	×							
Die making industry	(1) Improvement of die making technology 1. Mastery of basic die technology	1. Awareness of the importance of these efforts and key points		×	×			×		
		2. Mastery of technology through individual instruction at companies		×						
		3. Promotion of core companies		×						
		4. Grade-up of the sub-sector			×	×	×	×		
	2. Modernization of facilities and equipment	1. Increased awareness of the importance of these efforts		×	×					
		2. Introduction of suitable facilities and equipment		×	×		×			
		3. Development of public and common facilities				×	×			
		4. Funding assistance		×	×	×				
	(2) Promotion of tie-ups with foreign firms for increasing technology transfer			×	×	×			×	×
	(3) Improvement of a technology infrastructure 1. Expansion of technical supporting services system	1. Development of public and common facilities				×	×			
		2. Promotion of private-sector firms specializing in supporting services				×				
	2. Localization of production of die materials									
	3. Improvement of R&D, testing, and technical guidance facilities	1. Increase in an instructor staff		×						
		2. Facility- and operation-related improvement					×	×		
	4. Promotion of standardization of dies and die components	1. Dissemination of standards through industry's active participation		×	×			×		
		2. Enhancement of inspection systems						×		
	5. Training of engineers and technicians	1. Increased awareness of market needs		×	×		×			
		2. Promotion of technology transfer								×
		3. Improvement of university-level education								
Processing and assembly industries	- Expansion of die/mold demand with the development of the parts and assembly industries	- Greater export promotion measures	×						×	

Note: "Schedule" symbols: A = Should be implemented immediately, B = Preparations should be begun immediately, C = Medium- to long-term project, ** = Key project

Table III-6-2: Outline of Development Programs for the Die Making Industry (1)

Programs & project	Outline of project	Requirements of project	Recommendation on implementation	Remarks
I. Establishment/assignment of government agency for industry policies planning/monitoring				
	Assignment or establishment of government agency in charge of policies with the following functions: 1. Planning and mapping out strategic development of the entire machinery and metal engineering industry. 2. Necessary coordination among the related government agencies and organizations. 3. Monitoring and analyzing conditions and effects of policy implementation and reflecting the results in the revision of policy.	1. Engagement of consultants to assist in the establishment of the system. 2. Assignment of engineering officers who have completed specialized courses in metal engineering and machinery industry. 3. Dispatch of administrative and engineering officers for study overseas. 4. Organization of council to draw up development plans for machinery and metals industries. 5. Regular reporting system and special research to grasp the actual situation of the sector.	1. Promotion of project: BOI 2. Implementation: BOI/Industry Group 3. Schedule: Immediate implementation is recommended.	
II. Improvement in production and management technologies of die-making firms				
1. Advisory project for upgrading technology and product quality	1. Nurturing of the potential core firms for the modern die making industry through guidance for individual firms in the improvement of production and management technologies. 2. Nurturing of local guidance staff. 3. Activities for introducing nurtured firms to domestic and overseas user enterprises. 4. Assistance for modernization of facilities of nurturing firms.	1. Formation of an appropriate advisory team by overseas experts, and a support team by domestic guidance organization. 2. In-advance setup of methods for introducing nurtured firms to domestic and overseas user enterprises. 3. In-advance setup of incentive measures for nurtured firms.	1. Promotion of project: BOI and DOST (MIRDC). 2. Implementation and coordination: Organization of secretariat by MIRDC. Establishment of promotion committee including representatives of user industries. 3. Schedule: Immediate implementation is recommended.	It is recommended that the project begin with the field of dies for pressing and precision pressing and extend to those for die casting and plastics in the future.
2. Project for suitable modern die-making factory recommendation system	Encouraging the firms to make efforts for technological/management improvement to obtain the eligibility to the recommendation, through: 1. System of "modernized die-making factory" 2. Assistance for activities to introduce recommended factories to domestic and overseas users.	1. Implementation in advance of technical guidance project such as Advisory Project for Upgrading. 2. In-advance setup of a system of activities for introducing recommended factories to domestic and overseas users. 3. In-advance setup of encouragement measures should be established.	1. Promotion of project: BOI and MIRDC 2. Implementation and coordination: Secretariat and promotion committee of the Advisory Project for Upgrading is recommended to be utilized for this project. 3. Schedule: The plan should be implemented when core die-making firms have been formed, the number of die-making firms has increased and a system for technological and financial assistance has been established.	

Table III-6-2: Outline of Development Programs for the Die Making Industry (2)

Programs & project	Outline of project	Requirements of project	Recommendation on implementation	Remarks
II. Improvement in production and management technologies of die-making firms (continued)				
3. Establishment of industrial estate for metal engineering industry	Establishment of industrial estate for the metal engineering industry with concentrating efforts of infrastructure improvement on this area.	1. Sufficient in-advance study and preparatory work. 2. Sites should be selected taking into account the proximity to user enterprises. 3. Supporting service firms should be attracted. Establishment of facilities for common use should be considered, if necessary. 4. Preparation of incentive packages for tenant firms.	1. Promotion of project: EOI 2. Schedule: Work should start when demand for dies has increased and the number of die-making firms has begun to increase. However, the preparation is recommended to be begun immediately.	
4. Establishment of die making industry assistance center	Establishment of an organization to provide technological guidance and assistance in accordance with the various stages of development of the die making industry. Necessary functions in the initial stage are as follows: - Holding of seminars and workshops on technology and production management for the improvement of die making technology. - Operation training, lending by the hour and guidance services for machinery and facilities whose introduction is desirable in the near future. - Facility services of highly advanced machines which currently are not used frequently, supporting technological facilities and test and inspection facilities.	1. The operation system to meet the needs of the die making industry. 2. Securing the funds for operation. 3. Adequate maintenance system of facilities and machinery and spare parts and materials supply system. 4. Training of guidance staff. 5. Appropriate location of the center in view of training, guidance and facility services.	1. Promotion of project: DOST 2. Implementation: Initially, the center should be attached to MIRDC. Establishment of operating committee reflecting the needs of the die making and user industries is indispensable. 3. Schedule: Preparation be started immediately.	Estimated funds required (including building): 916 million yens (7.646 million U.S.dollars)
5. Promotion of die/mold related standardization	Industrial standards for dies/molds are sufficiently developed at the present stage. Dissemination system and inspection system should be improved so that these standards are actually applied.	1. Active participation of the die making and die user industries. 2. BPS should assess the factors impeding the inspection system development and request various related agencies for further sup port, if necessary.	1. Implementation: BPS 2. Schedule: BPS is recommended to begin with the necessary action including program preparation.	

Table III-6-2: Outline of Development Programs for the Die Making Industry (3)

Programs & project	Outline of project	Requirements of project	Recommendation on implementation	Remarks
III. Recommendation on the promotion of exports of metal worked parts				
	In implementing the current production program for automobiles and electrical appliances, measures to promote exports of metal worked parts in particular should be strengthened. For instance, - Advanced firms overseas should be encouraged to setup parts procurement centers in the Philippines. (In addition to the existing incentives, the enhancement of communication facilities and the simplification of export procedures, etc., should be considered.) - Incentives for exporting firms should be applied to enterprises attaining a local content ratio of 100%. - Encouragement of domestic production by setting incentives for those who cleard the local content target.	1. Export promotion measures and incentives measures should be limited to compensate for the cost penalties arising from the small size of the market and should gradually be reduced when cost penalties diminish due to the expansion of the market. 2. A system should be established to monitor the economic effects and social costs arising from the implementation of the program.	Schedule: Immediate implementation is recommended.	
IV. Activities for the promotion of tie-ups with die-making firms overseas				
	1. Formation of organization to promote tie-ups with overseas firms. 2. Continuous activities including establishment of a data base, information gathering and mission dispatch. 3. Development of personal relations through the continuous dispatch of trainees overseas.	1. Nurturing of Modern Die-making Factories through the implementation of the Advisory Project for Upgrading Technology and Product Quality, project for Suitable Modern Die-making Factory Recommendation System, and so on, is the prerequisite. 2. Support from user industries.	1. Implementation: The program should be implemented by MIAP with assistance from BOI, BETP, CITEM, and the offices of the Philippine Government abroad. Assistance by user industries is indispensable. 2. Schedule: The project should be introduced when core die-making firms have been formulated.	

Table III-6-3: Design Basis of Industrial Estates for Metal Engineering Industry

(1) Land area: 10 ha (=100,000 sq.m)

(2) Number of factories to be located: 20 factories

(3) Common Service Facilities (CSF)
1) Administration office
2) Machine shop with calibration room
3) Heat treatment shop
4) Laboratory

(4) Use of land

For 20 factories:	69,000 sq.m
For CSF:	6,000 sq.m
For infrastructure (road ect.):	25,000 sq.m

(5) Buildings

20 factories: 36m x 15m = 540 sq.m/factory
540 sq.m/factory x 20 factories
= 10,800 sq.m

CSF

- Administration office:	12m x 18m = 216 sq.m
- Machine shop with calibration room:	12m x 48m = 576 sq.m
- Heat treatment shop:	12m x 36m = 432 sq.m
- Laboratory:	6m x 18m = 108 sq.m

(6) Utilites & manpower

	Electricity (kW)	Water (cu.m/day)	Manpower (persons)
20 factories	1,440	80	520
CSF	685	25	127
Total	2,125	105	647

Table III-6-4: Facilities and Equipment for a Die Making Industry Assistance Center (1) (Example)

Group	Name of Machinery & Equipment	Specification	Number
Machine Tool	1) Radial Drill	1010mm spindle to column distance and 50mm drilling capacity, with tooling	1 unit
	2) Upright Drilling and Tapping Machine	650mm maximum swing, 60mm drilling capacity, with tooling	1 unit
	3) CNC Precision Lathe	460mm swing over bed, 800mm distance between centers, with accessories and tooling	2 units
	4) CNC Vertical Machining Center	1100mm x 520mm table size, X,Y,Z = 800 x 500 x 550 mm with accessories and tooling	1 unit
	5) NC High Precision Universal Grinding Machine	180mm swing over table, 250mm distance between centers with accessories and tools	1 unit
	6) CNC Precision Form Grinding Machine	600mm x 300mm table work area	1 unit
	7) Precision Column Type Surface Grinding Machine	1200mm x 500mm table surface with accessories and tools	1 unit
	8) NC Jig Grinding Machine	790mm x 600mm table working surface, X,Y,Z travel = 610 x 410 x 460mm with standard accessories	1 unit
	9) Centerless Grinding Machine	Up to 90mm grinding capacity with standard workrest, with accessories	1 unit
	10) Universal Tool and Cutter Grinding Machine	With accessories and tools	1 unit
	11) Vertical Bandsaw	300mm maximum cutting height, 400mm maximum cutting width	1 unit
	12) Power Hacksaw	250mm diam. cutting capacity	1 unit
	13) CNC EDM Die Sinker	1000 x 650 x 410mm tank	1 unit
	14) CNC Wire-cut EDM	650 x 750 x 260mm maximum workpiece size with controls and standard accessories	1 unit
	15) CNC Horizontal Boring and Milling Machine	100mm spindle diameter, X,Y,Z = 1600 x 1200 x 1100mm	1 unit

Table III-6-4: Facilities and Equipment for a Die Making Industry Assistance Center (2) (Example)

Group	Name of Machinery & Equipment	Specification	Number
Measuring Instruments	1) Profile Projector	600mm diameter screen, magnifications = 5,10,20,50,100X with standard accessories	1 unit
	2) Roundness Measuring Machine	Portable type, metric scale	1 unit
	3) Portable Surface Roughness Tester	12.5mm evaluation length, with recorder, printer and standard accessories	1 unit
	4) Motor Drive CNC Coordinate Measuring Machine	X,Y,Z measuring range = 1000 x 1500 x 1000mm with standard accessories	1 unit
	5) Digimatic Outside Micrometer	Measuring range: 0-150mm	1 unit
		Measuring range: 150-300mm	1 unit
	6) Interchangeable Anvil Type Outside Micrometer	Measuring range: 0-150mm	1 unit
		Measuring range: 150-300mm	1 unit
	7) Tubular Inside Micrometer	Measuring range: 50-300mm (10 pcs./set)	1 set
	8) Deep Throat Type Micrometer	Measuring range: 0-25mm; throat: 300mm	1 unit
	9) Deep Throat Type Micrometer	Measuring range: 0-25mm; throat: 150mm	1 unit
	10) Blade Micrometers with Non-rotating Spindle	0.75mm thick x 6.5mm long blade, 0-100mm measuring range (4 pcs./set; measuring range: 0-25mm, 25-50mm, 50-75mm and 75-100mm)	1 set
	11) Small Hole Gauge	Measuring range: 3-13mm	1 set
	12) Bore Micrometers (Holetest)	Measuring range: 6-12mm	1 set
		Measuring range: 12-20mm	1 set
		Measuring range: 20-50mm	1 set
	13) Bore Micrometers (Holetest)	Measuring range: 50-100mm	1 set
		Measuring range: 100-200mm	1 set
	14) Digimatic Vernier Caliper	Measuring range: 0-300mm	1 unit
	15) Digimatic Vernier Caliper	Measuring range: 0-450mm	1 unit
	16) Vernier Calipers	Measuring range: 0-300mm	3 units
	17) Vernier Calipers	Measuring range: 0-600mm	1 unit

Table III-6-4: Facilities and Equipment for a Die Making Industry Assistance Center (3) (Example)

Group	Name of Machinery & Equipment	Specification	Number
Measuring Instruments (cont'd)	18) Rectangular Gauge Blocks	Steel, grade 0, 112 pcs., metric	1 set
	19) Square Gauge Blocks	Steel, grade 0, 112 pcs., metric	1 set
	20) Height Master	0.001mm resolution, 10-610mm	1 unit
	21) Black Granite Surface Plate	1500 x 1000 x 200mm, 9 micrometer flatness x 1 micrometer/100mm straightness with stand for granite surface plate	1 unit
Heat Treatment Facilities	1) Vacuum Heat Treatment Furnace	Max. temperature: 1350 deg.C; effective dimension: 300 W x 200 H x 300 L mm; work load capacity: 30kg gross; complete with vacuum pump, quenching tank and controls	1 set
	2) Salt Bath Heat Treatment Furnace, Electrode Type	Working temperature: 950 deg.C; internal dimension: 400 W x 400 L x 500 H mm; rated voltage at transformer: 220V, 3-phase, A.C.; complete with power transformer, control unit and vent hands with exhauster	1 set
	3) Electric Pit Furnace with Forced Air Circulation	Working temperature: 550 deg.C; effective dimension: 500mm diameter x 800mm depth; rated voltage: 220V, 3-phase, A.C.; power rating: 40kW; complete with controlling unit for current and temperature	1 set
	4) Electric Box Furnace	Working temperature: 900 deg.C; internal dimensions: 350 W x 250 H x 600 L mm; rated voltage: 220V, 3-phase, A.C.; complete with temperature control	1 set
	5) Hardness Tester, Rockwell Type	Digital	1 set
	6) Hardness Tester, Brinell		1 set

Table III-6-4: Facilities and Equipment for a Die Making Industry Assistance Center (4) (Example)

Group	Name of Machinery & Equipment	Specification	Number
Design and Equipment	1) CPU	Clock: 25 MHz; memory: RAM 4MB, HDD 120MB; FDD: 3.5" x 1, 5" x 1; graphics: VGA module; co-processor: 25 MHz	1 set
	2) Color Monitor	Frequency: multi scan (30-78 kHz); screen: 21"; dot pitch: 0.31mm; power: 110-240V, 50/60 Hz; dimension: 488 W x 467 H x 534 D mm	1 set
	3) Color Graphics Board	Resolution: 1280 x 1024 pixels; colors: 256; display: 14" (for dual system screen)	1 set
	4) Digitizer	Digitize area: 310 x 422mm; resolution: 0.02/0.1 mm; digitize rate: 220 coordinates/sec.; cursor: 16 buttons	1 set
	5) Plotter	Protting area: 2000 x 890mm (normal), 2000 x 905mm (expand); plotting speed: 1202 mm/sec. (45 degrees), 850 mm/sec. (axis), 600 mm/sec. (all direction); pen: pencil type pen 50 pcs., ceramic or fiber pen 8 pcs. (colors)	1 set
	6) Software	MS-DOS and Autocad Manuals	
	7) Uniterruptible Power Supply	Capacity: 1.25kW	1 set
	8) Application Software for CAM		

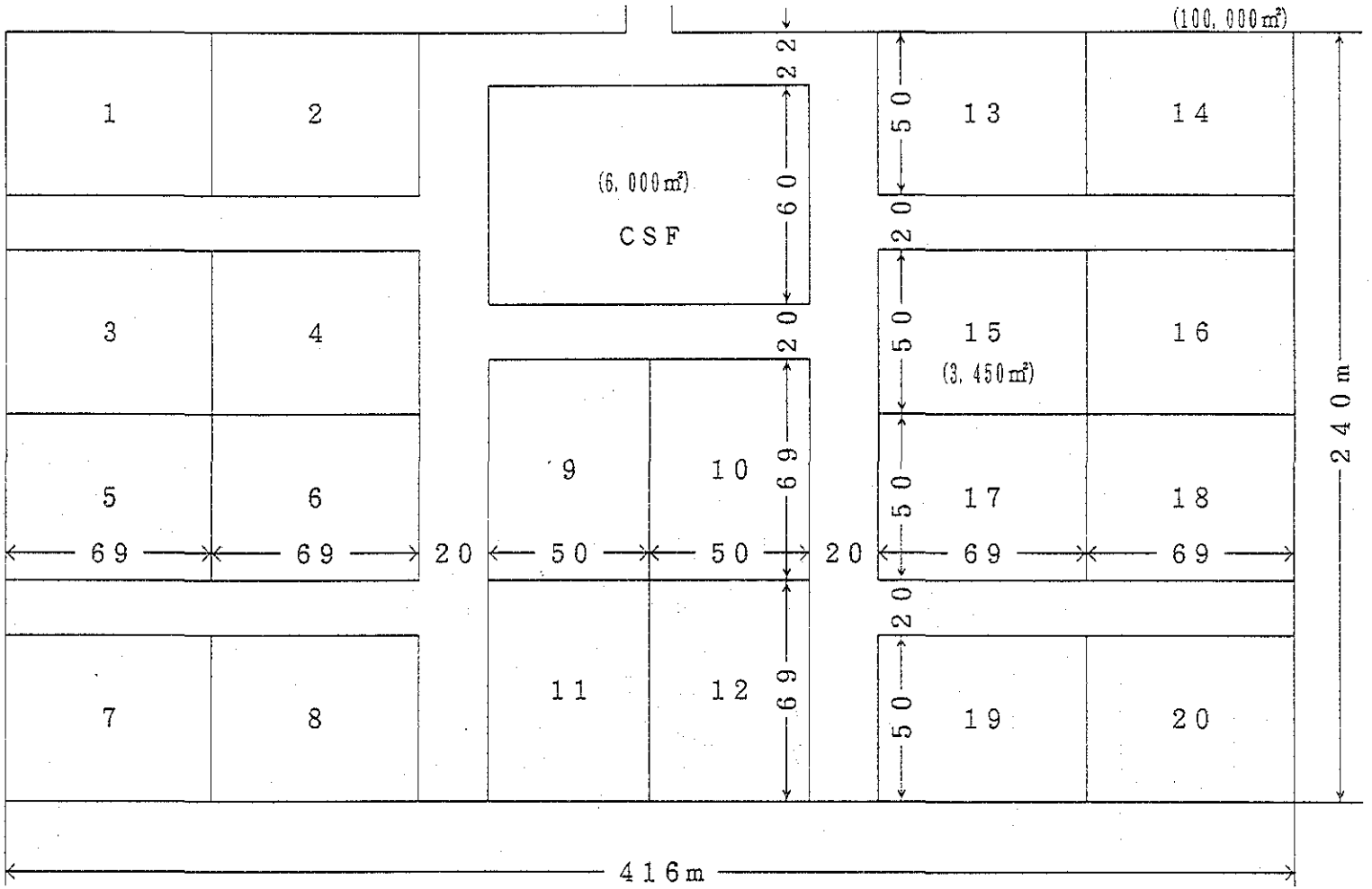
Table III-6-5: Estimated Construction Costs of Technical Assistance Center for Die Making Industry

Particular	Estimated Costs	
	in million yens	in thousand US dollars
1. Machines and Equipment	682	(5,246)
Of which:		
Machine tools	470	(3,615)
Measuring instruments	50	(385)
Heat treatment facilities	60	(462)
CAD/CAM	13	(100)
Wiring/piping/material handing facilities	89	(684)
2. Construction of Buildings	234	(1,800)
Of which:		
Office building		
(2 stories, total floor area: 600 sq.m)	90	(692)
Factory (2 buildings, total floor area: 960 sq.m)	144	(1,108)
Total	916	(7,046)

Notes: Assumptions for the above cost estimate are as follows.

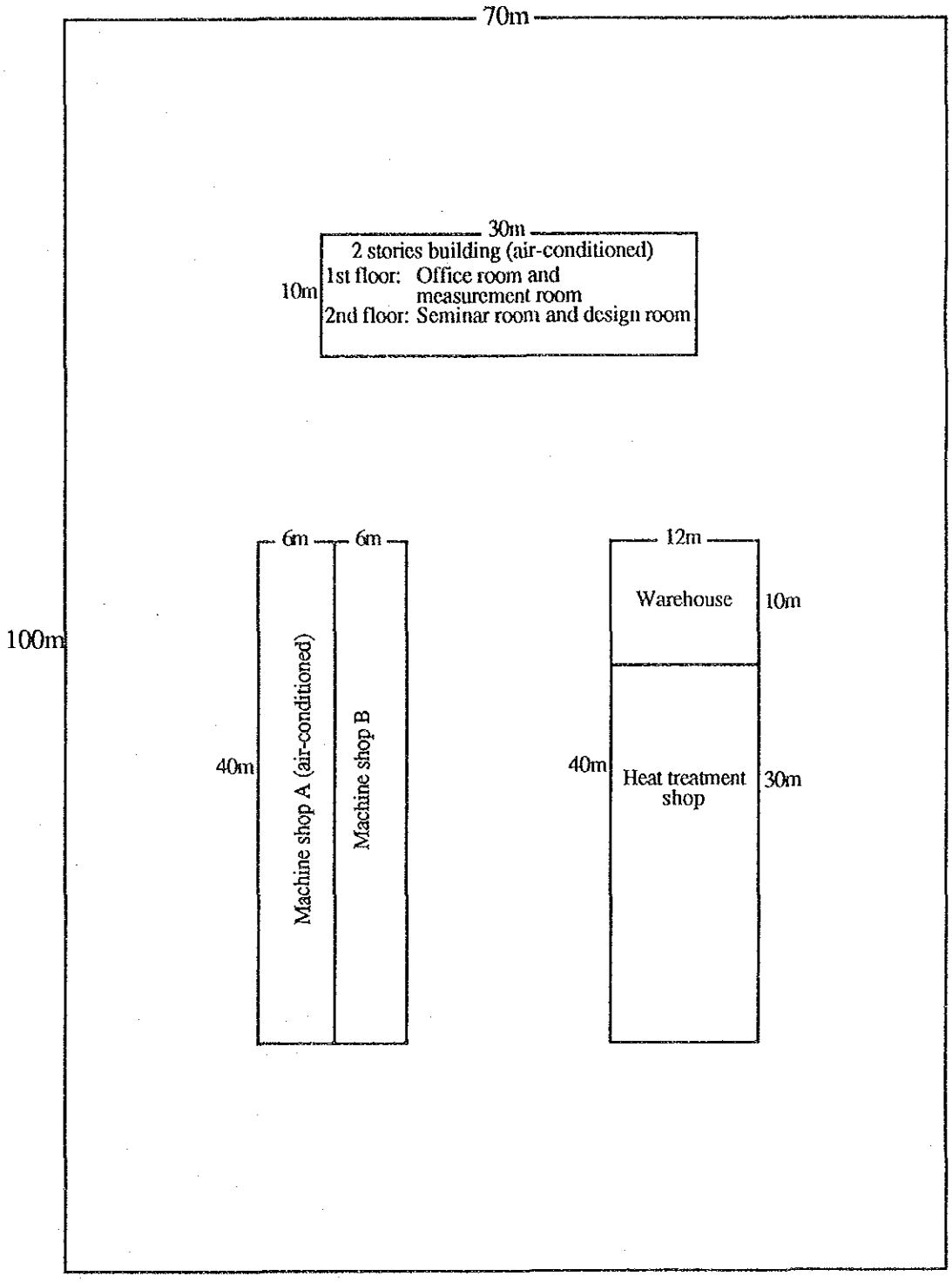
1. A rough estimate based on the concept shown in Table III-6-4 (machines and equipment) and Figure III-6-2 (layout).
2. Estimate as of November, 1990.
3. The costs of machines and equipment above are calculated on the basis of ex-factory prices of major machines and equipment, adding packing, transportation and other costs up to the construction site. Installation is assumed to be undertaken by the Philippine side. The necessity of power-receiving facilities should be studied carefully prior to the implementation.
4. The land for the project is assumed to be owned by the government, and costs of land acquisition and site preparation are not included in the above estimate, presuming the site is ready for construction.
5. Import tax is not included.
6. Foreign exchange rates used are;
   1 peso=4.82 yens, 1 US dollar=27 pesos, 1 US dollar=130 yens

Fig. III-6-1: Layout Sample for Metal Engineering Industrial Estate



Note: Major design basis is given in Table III-6-3.

Fig. III-6-2: Layout Sample of Die Making Industry Assistance Center



ANNEX

ANNEX

III-1. Japanese Company's Interest in Overseas Investment (Result of Questionnaire Survey)

1. Firms surveyed, methodology and conducted time

Questionnaires were mailed to 246 die manufacturers and users in Japan. In addition, some of the responding firms and die experts experienced in the overseas exchange of technology were interviewed from June to August 1990.

2. Responding firms

Responding firms included 25 die manufacturers and 10 users, three of which manufacture dies in-house as well. Questionnaire results were tallied by dividing the firms into die manufacturers and users. Firms which belonged to both categories were counted twice, so that total figures sometimes exceed the number of responding firms.

3. Summary of survey results

Out of a total of 32 responding firms, 12 (eight manufacturers, six users and two in-house users) had overseas production bases. Eleven had production bases in Asia, for a total of 21 cases of investment.

Four firms (two die manufacturers and two in-house users) had made investments in the Philippines. Together with Malaysia, the Philippines accounted for most of the firms' investment in Asia. None of the four specialized in the manufacture of dies.

Classified by type of investment in Asia, direct investment accounted for 85.7 percent of the total, with "wholly owned" numbering seven cases and "joint ventures" 11. As for the Philippines, there were two cases of "wholly owned," one "joint venture" and two instances of "production on consignment." With one case consisting of both direct investment and production on consignment, three out of the four involved direct investment. There were no cases of die production on consignment to local Philippine companies.

"Access to local markets," "a means of coping with the stronger yen," "securing labor force" and "exports to third countries" ranked high in order among the objectives for investment in Asia. Concerning the Philippines, "securing labor force" was the most highly-ranked objective (three out of the four firms).

Concerning the future establishment of production bases in Asia and plans for exchanges with die making industries/firms in the Asian countries, a majority of the responding firms gave replies of "now under study" or "room for study in future." Together with the Republic of Korea, the Philippines topped the list of countries picked as a likely place for investment (indicated by five firms each) followed by Thailand. These were followed by China, Malaysia, Singapore and Indonesia who are in the same rank. In the case of the Philippines, however, four out of the five replied "room for study in future."

When a question was posed about the existence of future plans for business and exchange with the Philippines to 21 firms which had no such relations now, 16 replied they had "no such plans." Nine of them cited concrete reasons such as "unstable political situation" or "public unrest." Four firms replied "room for study" but none indicated that such plans were currently under study. A major automaker, which replied "room for

but says it will have to import dies from Japan for the production of engines and other key components. When the four firms considering investing in the Philippines were asked about the type of investment, "joint ventures," "technological tie-ups" and "dispatch of technical experts" numbered two each among the replies.

Concerning the evaluation of the Philippines as an investment site, 22 replies were negative against five positive answers. Among the negative replies, the most numerous were 11 firms mentioning the unstable political situation, public unrest, and other aspects of the social environment, followed by four answers which dealt with the inadequate industrial infrastructure, technological foundation and other aspects of the investment climate, two replies that cited insufficient merits or attractiveness for investment, and five others which denied the possibility or necessity of investment and showed no interest at all. The firms which gave negative replies included 18 die manufacturers, two users and two in-house users. Considering the fact that manufacturers specializing in die production accounted for 22 out of the 32 responding firms, fully 80 percent of the manufacturers specializing in dies expressed negative views.

On the other hand, two die users and two in-house users gave positive appraisals of the market for its potential demand and an abundance of talented manpower. Although in-house users were included, all of the firms responding positively were inclined to view the Philippines as a production base for parts and finished goods manufactured using dies and not primarily as a base for die production. The five firms were engaged in die casting, automobile and home electric appliance manufacture.

Concerning types of information desirable when considering investment in the Philippines, "general information about politics, economy and society" and "wages, working conditions and labor laws and regulations" were most numerous, with 16 replies each. Uneasiness about the political situation and the attractiveness of abundant manpower seemed to be mixed.

Among a total of 32 respondent firms, three had used Philippine-made dies in the past. In a five-step appraisal of "precision," "durability," "price" and "delivery time," the three firms gave answers of "slightly unacceptable" for precision and durability, and "good" for price, while two each gave evaluations of "slightly unacceptable" and "ordinary" for delivery time. The typical evaluation of Philippine-made dies seemed to be that they have problems concerning precision and durability but are inexpensive.

Fig. A III-1-1: Existence of Overseas Production Bases

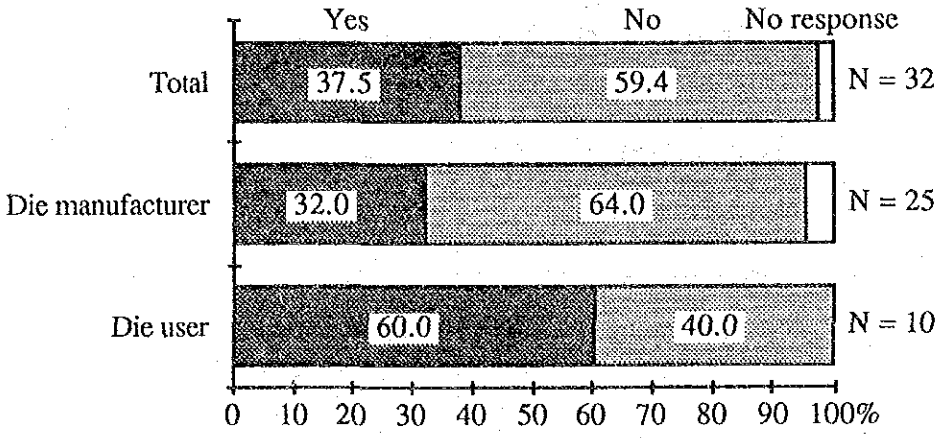


Fig. A III-1-2: Existence of Asian Production Bases

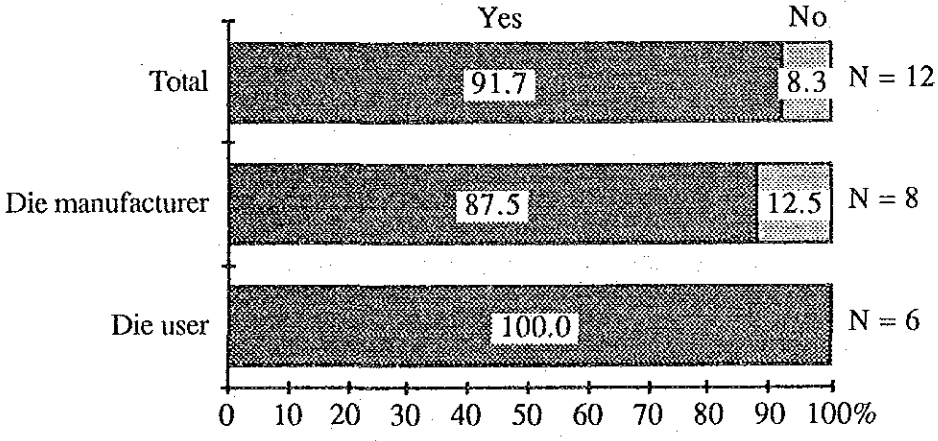


Fig. A III-1-3: Asian Countries & Territories with Investment

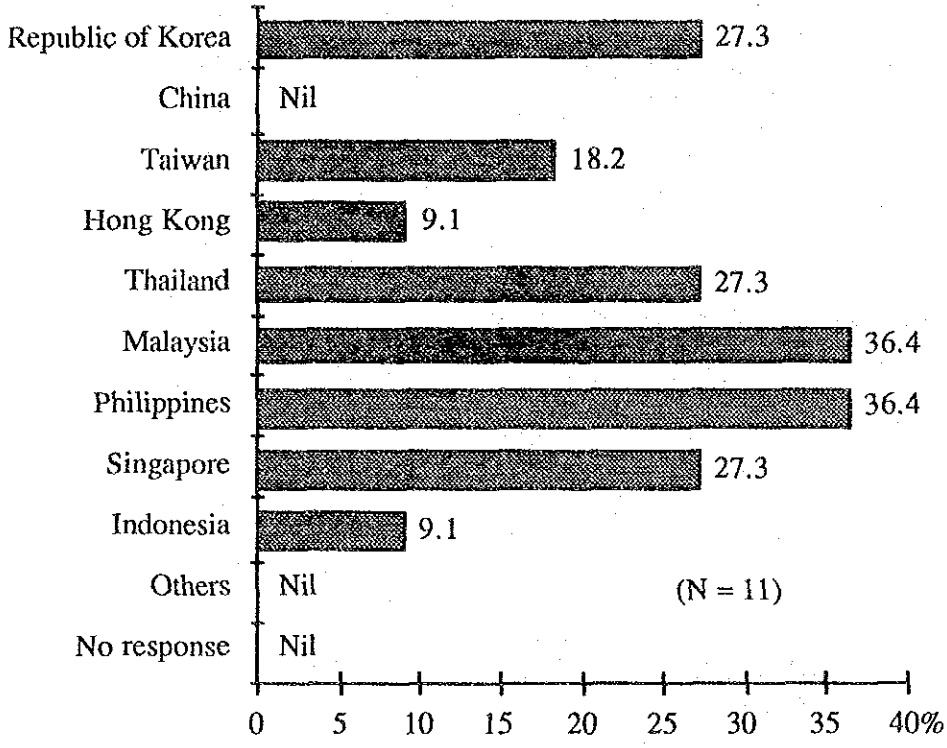


Fig. A III-1-4: Form of Investment in Asia

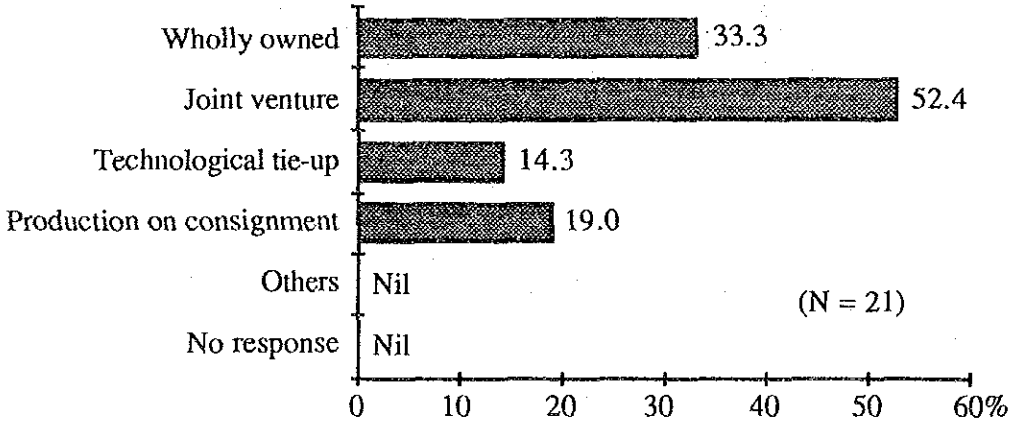


Fig. A III-1-5: Purpose of Investment in Asia

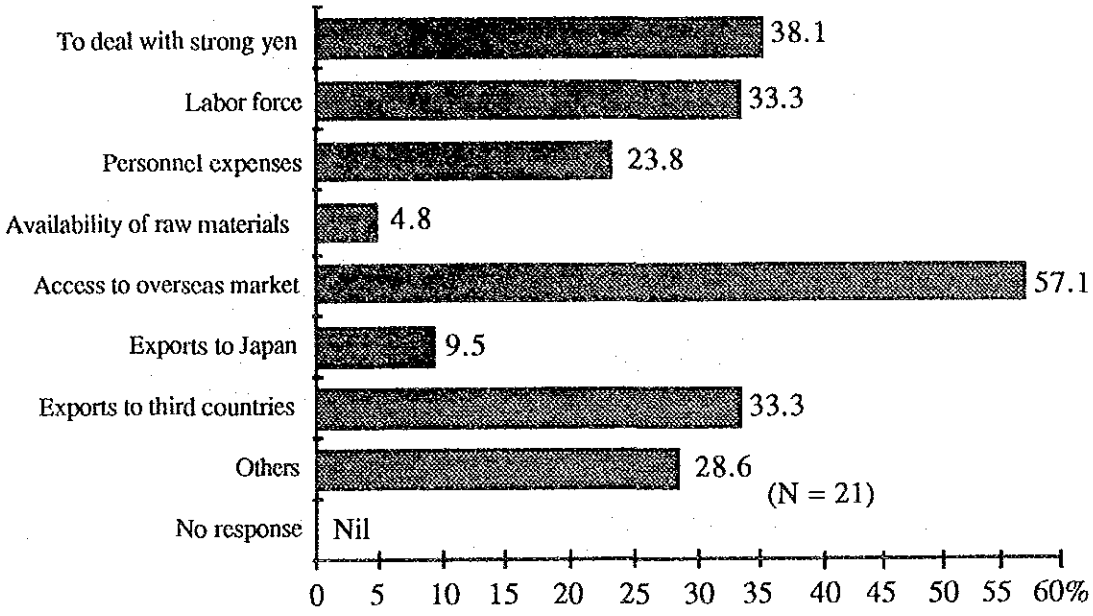


Fig. A III-1-6: Future Plans to Set up Production Bases in Asia

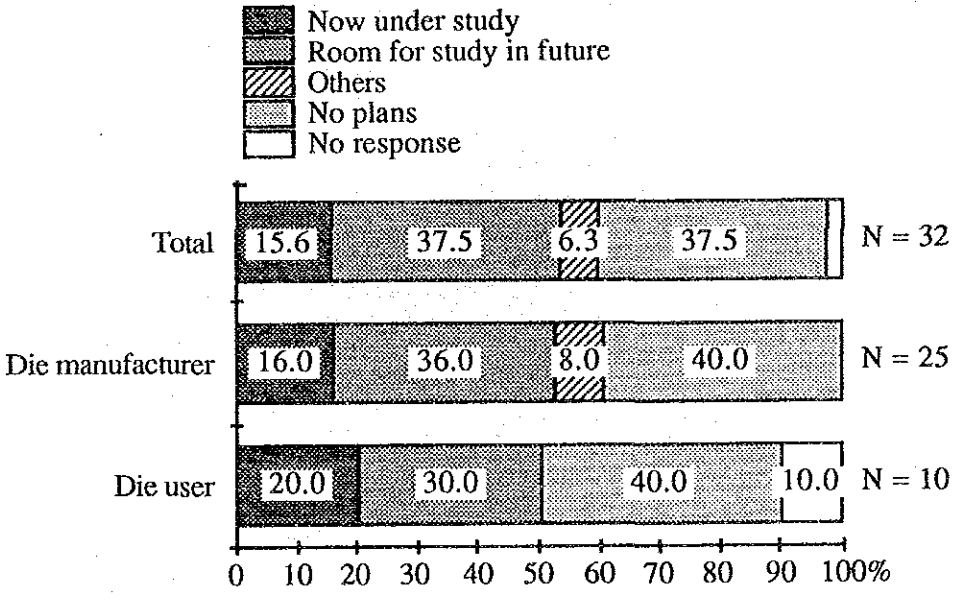


Fig. A III-1-7: Asian Countries & Territories under Consideration for Future Investment

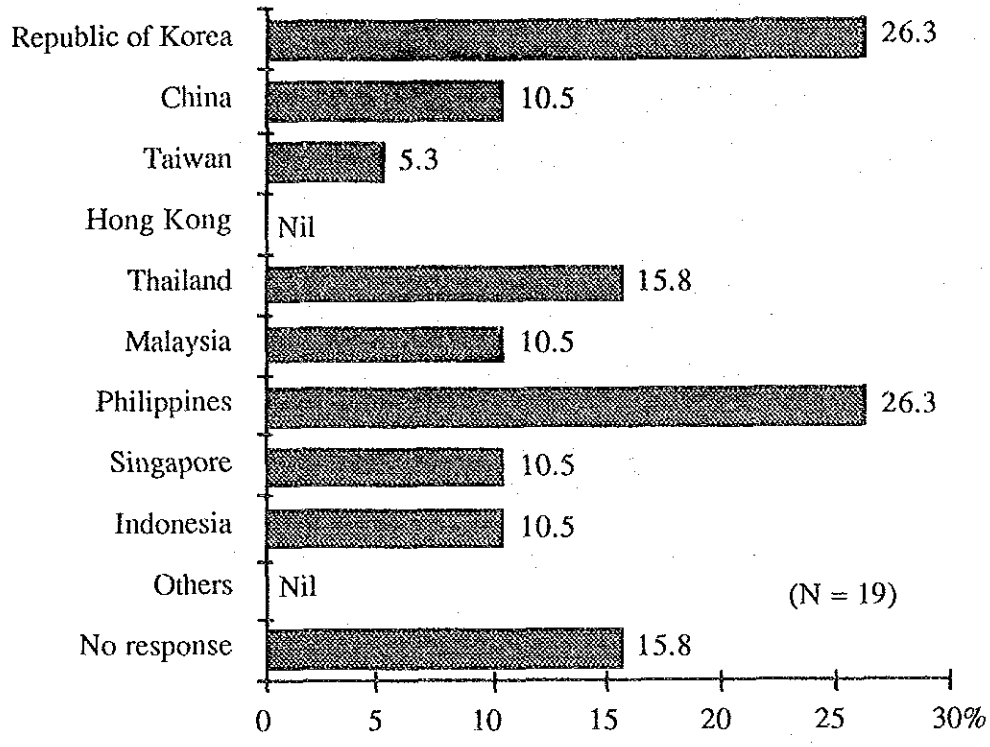
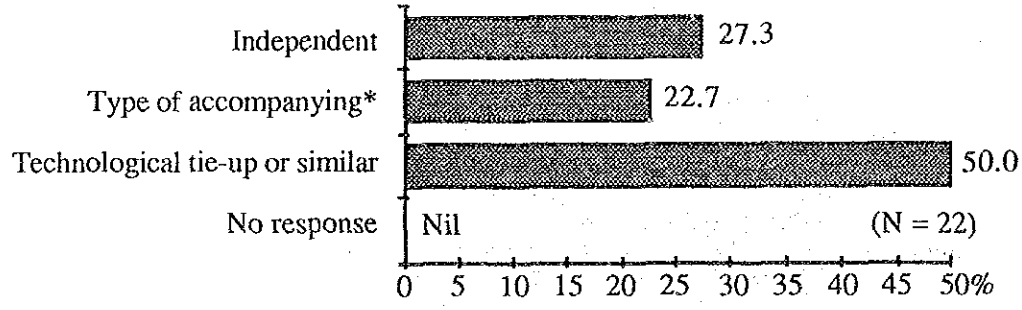


Fig. A III-1-8: Form of Investment in Asia



Note: *Accompanying with parent company, affiliate company, or similar.

Fig. A III-1-9: Present State of Relations with the Philippines

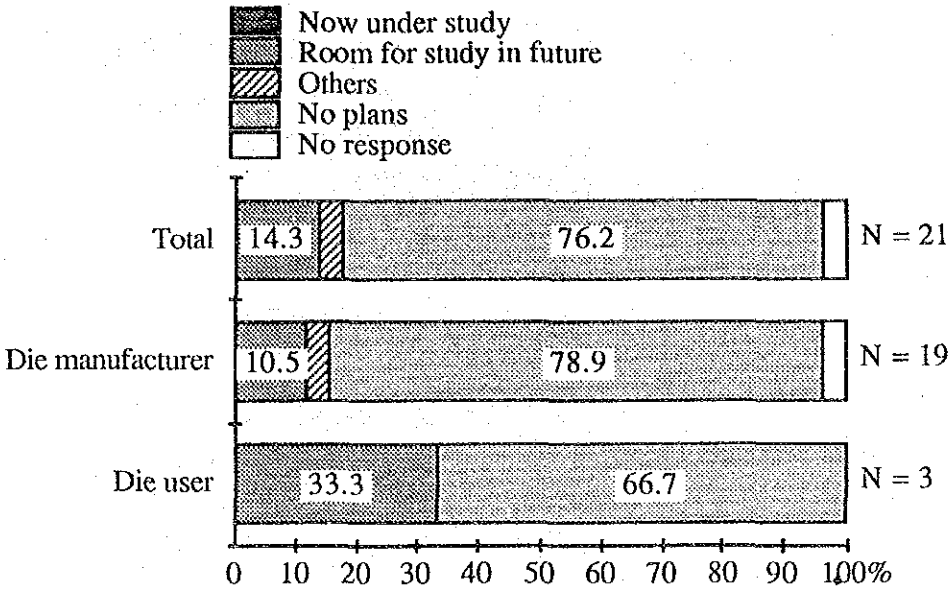


Fig. A III-1-10: Future Plans of Firms with No Current Relations with the Philippines

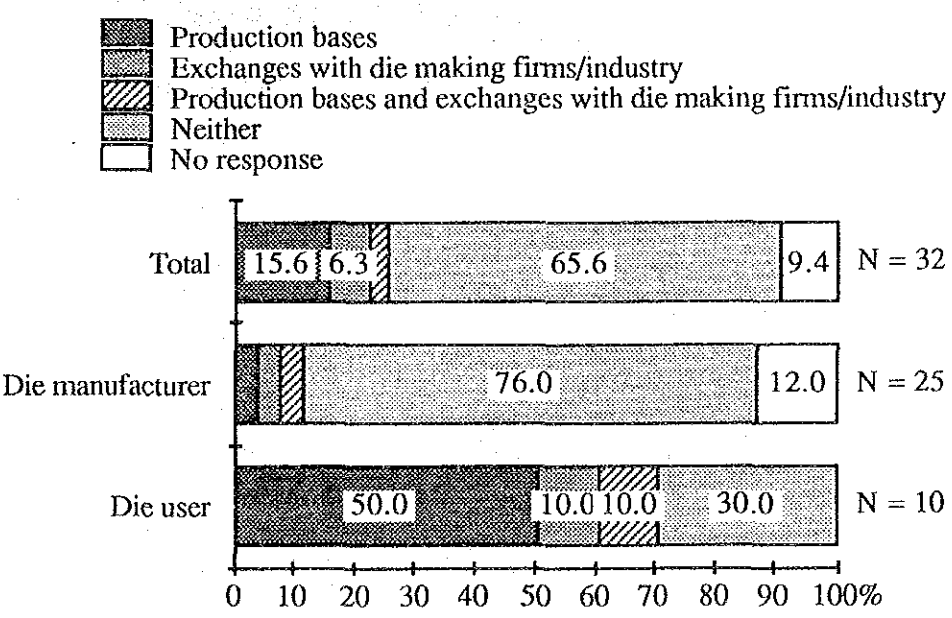
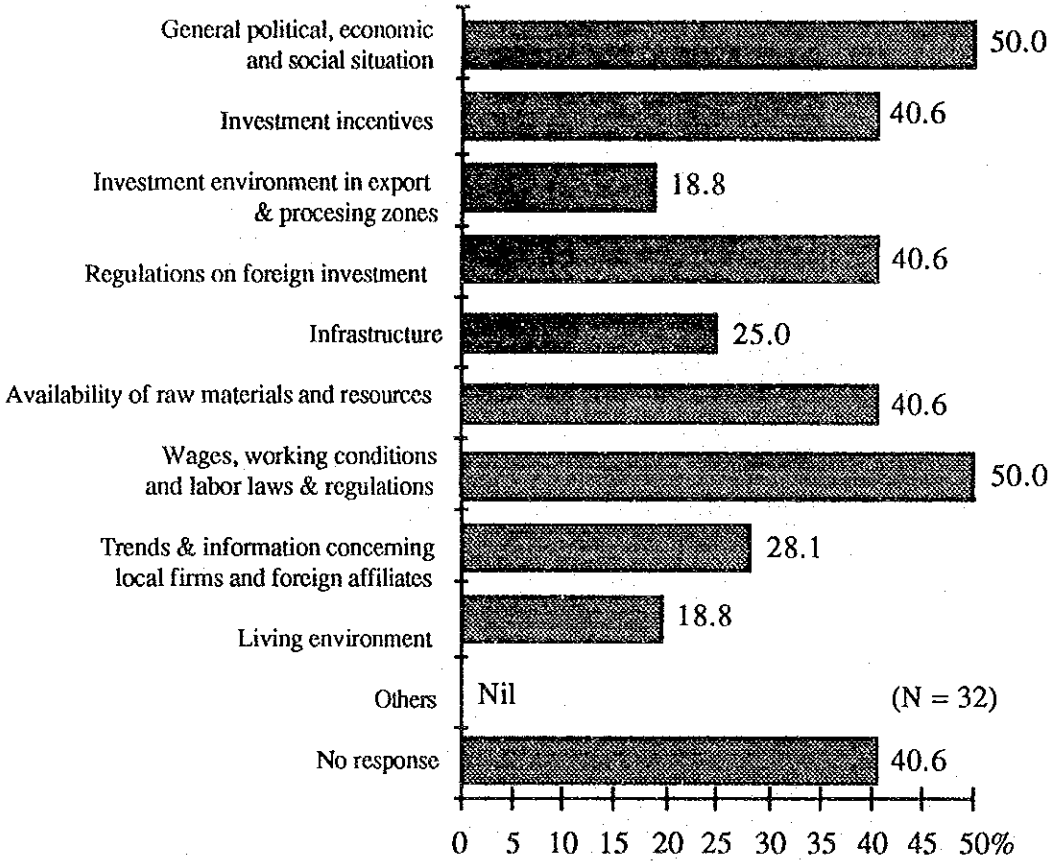


Fig. A III-1-11: Information Desired When Considering Investment in the Philippines



III-2. Findings on the Metal Working Mold and Die Sub-sector in the Philippines

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II. Users Without Mold and Die Shops
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III. Users with Mold and Die Shops
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Preface

To achieve a cross-sectional analysis of the study area, an investigation into pertinent supply and demand factors was undertaken. As such, firms categorized as follows were surveyed:

1. Manufacturers of metalworking molds and dies. These are companies which relied on mold and die manufacture for their main source of income.

2. Users of metalworking molds and dies. These are firms which purchased molds and dies for use in their main product lines (e.g. automobiles, appliances and other types of machinery).

3. Users of metalworking molds and dies capable of in-house mold and die manufacture. This category refers to companies which purchased molds and dies from outside sources in addition to making their own.

The field interviews generated the following number of responses:

Category of Respondent	Number
Manufacturer (Supply Side)	25
User (Demand Side)	23
User Manufacturing In-house	26
Total	74

I. Manufacturers

1. Company Profile

(1) Year of Establishment

60% of all surveyed firms started operation in the 1980s, 32% in the 1970s, and the remaining 8% in the 1960s.

The number of firms established relatively recently (i.e., during the period 1985-1989) and some time ago (in or before 1979), was roughly equal (32% each). The remainder had been in operation for six to ten years, i.e., they were established during the period from 1980 to 1984.

(2) Paid-Up Capital

A majority of surveyed firms had paid-up capital amounting to less than P4,000,000. 12% had less than P250,000; 24%, P250,000 to P499,999; and 20% each, P500,000 to P1,999,999 and P2,000,000 to P3,999,999.

Among the five firms with greatest capitalization, only three had at least P10,000,000.

(3) Main Products

Not all of the firms produced only molds and dies and/or tools and dies. Some were also engaged in the manufacture of motorcycle/automobile parts, machinery and related parts, appliances, and electronic equipment/semiconductors.

(4) Production Capacity

Annual production capacity for molds varied from 3 to 156 sets, while die capacity ranged from 15 to 30 sets. One firm said its mold and die capacity was set at 7 tons; another had a capacity of 6 tons. In the case of tools and dies, capacity ranged from 12 to 25 tons.

(5) Total Number of Employees

A majority of firms (68%) fell into the category of small businesses, i.e with 10-99 total workers. 28% had fewer than 10 workers, while 4% had at least 200 employees.

In terms of mold and die related employees, however, a majority of firms (56%) had fewer than 10 workers as compared with the 44% having 20-49 workers.

(6) Types of Molds and Dies Manufactured

Among the various types of molds and dies manufactured, very small press dies were the most frequently mentioned (56%), followed by small press dies (48%), progressive dies (48%), medium-size press dies (44%), and stamping dies (40%).

Very small and small press dies were prevalent among firms which manufactured products (e.g., machinery and automobile machinery and related parts) other than molds and dies. Small-and medium-size press dies were more common among those which produced only molds and dies.

(7) Annual Turnover (for 1989 and 1st Quarter 1990)

In 1989, nearly one-half or a combined 48% of total surveyed firms were found in the lower sales brackets, i.e., less than P4,000,000. Those in the high-turnover groups were distributed as follows: 8% with P4,000,000 to P6,999,999; 16% with P7,000,000 to P9,999,999; and another 8% with P10,000,00 and over.

During the first quarter of 1990, the highest figure reached by surveyed firms was between P1,000,000 and P3,999,999 (32%). Lower figures included P500,00 to P999,999 (4%) and less than P500,00 (20%).

(8) Exports of Molds and Dies and Main Overseas Markets

Of the 25 surveyed firms, only 12% were engaged in the export of molds and dies; the remaining 88% were not.

Specifically, two companies exported molds and dies to the United States and one each to Australia and Saudi Arabia.

Only one of the three firms gave detailed accounts of its export figures. This company exported ten sets of molds in 1989 and one set during the first quarter of 1990.

In terms of value, the respective export figures registered in 1989 by the three exporters were P13,680,000 (US$60,000) (molds); P1,259,165 (both molds and dies), and P5,700,000 (US$25,000) (die parts for use in the manufacture of semiconductors).

During the first quarter of 1990, corresponding export figures for the same products were P1,254,000, P45,623 and P1,026,000, respectively.

(9) Expansion of Mold and Die Production, Areas of Expansion

92% of the firms expressed a desire to expand their mold and die business, while the remaining 8% had no such intentions.

Of the 23 firms with plans for expansion, 87% indicated that they would do so in the area of production capacity, 52% in the form of expanded product lines, and 48% through geographical market expansion. Of the 11 firms which mentioned market expansion, nine had plans to carry out such expansion both locally and abroad; five, overseas markets only; and two, local markets only.

2. Analysis of Data

(1) Mold and Die Manufacturing Capacity

(1)-1 Rated Mold and Die Manufacturing Capacity

One firm which supplied molds to machinery manufacturers had a rated capacity of 60 sets per year; another was capable of producing 60 sets per year for clients in the semiconductor industry; and yet another had a mold-making capacity of only three sets per year, this for spare parts in the appliance industry.

Only one firm gave figures on rated die-making capacity, i.e., 15 sets per year. Its main client happened to be in the appliance industry.

For both mold and die products, the rated manufacturing capacity of the three firms varied from 58 sets to 15-20 sets (both of which were made-to-order for machinery manufacturers) and 10-15 sets (for the automobile industry).

For tools and dies, rated capacities ranged from 1 to 4 sets and from 1 to 2.5 tons at firms which catered to at least three industry sectors: automobiles, electric appliances, and machinery.

(1)-2 Average Monthly Mold/Die Production

Type of Product	Average Monthly Production
Molds	3 sets
	1 set
	3-5 sets
Dies	1.5 sets
	10-15 sets (parts of one die)
Tool	1 set
Molds and Dies	3 sets
	1.6 sets
	2 units
	45 kilos
	5 sets
Tools and Dies	2 tons
	1 set
	Less than 1 set
	3-4 sets
	1 set

(2) Annual Turnover and Percentage of Molds and Dies

In terms of the actual contribution of molds and dies to annual turnover, a little less than one-third, or 32% of the firms, said it ranged from 61-100%. Small to moderate shares of 1-20%, 21-40%, and 41-80% were indicated by 6%, 4% and 8% of the firms, respectively.

(3) Annual Exports and Percentage of Molds and Dies

Based on the responses of three firms, the Philippine export market for molds and dies seemed underdeveloped. This conclusion was supported by the small number (three) of exporting firms as well as by data on the ratio of molds and dies to total exports (1-20% at two of the exporters and 81-100% at one.)

(4) Destination of Manufactured Molds and Dies

Molds and dies sold on a job-order basis were more common than those sold exclusively or specifically to a limited number of users. Eleven firms accepted orders for molds and dies on the former basis as compared to seven firms on the latter arrangement. Six other firms manufactured molds and dies not only for other companies but for in-house use as well.

(5) Users of Molds and Dies

There were more firms supplying at least two clients than those having only one. Regardless of the number of clients, however, a majority of firms mentioned electrical appliance manufacturers (52%) as customers, followed by automobile assemblers (44%) and integrated circuit manufacturer/assemblers and semiconductor manufacturers (44%).

(6) Sources of Technology for Mold and Die Manufacture

The most common source of technology was in-house development (84%) followed by buyers (56%). A small number cited parent companies (8%) and affiliates (8%).

Technical magazines, experience, and training abroad were likewise mentioned.

(7) Type of Equipment in Use

Type of Equipment in Use

Type of Equipment	New		Used		Unspecified
	No.	%	No.	%	
General-Purpose Machine Tools					
Lathes					
1-3	10	40	5	20	2
4-6	–		6	24	
6-9	1	4	–		3
10 or more	–		1	4	
Shaping Machines					
1-3	10	40	8	32	3
4-6	–		–		
6-9	–		–		
10 or more	–		–		
Planers					
1-3	2	8	2	8	1
4-6	–		–		
6-9	2	8	–		
10 or more	–		–		
Milling Machines					
1-3	10	40	6	24	2
4-6	–		–		1
6-9	3	12	1	4	2
10 or more	–		1	4	

Type of Equipment	New		Used		Unspecified
	No.	%	No.	%	
Drilling Machines					
1-3	9	36	5	20	2
4-6	3	12	2	8	2
6-9	–		1	4	
10 or more	–		–		
Special-Purpose Machine Tools					
Electrically Discharged Machines (EDM)					
1-3	8	32	3	12	
4-6	–		–		
6-9	–		–		
10 or more	–		–		
Wire Cut EDMs					
1-3	1	4	–		
4-6	–		–		
6-9	–		–		
10 or more	–		–		
Machining Centers					
1-3	–		1	4	
4-6	–		–		
6-9	–		–		
10 or more	–		–		
Copy Milling Machines					
1-3	2	8	4	16	
4-6	–		–		
6-9	–		–		
10 or more	–		–		
Surface Grinding Machines					
1-3	6	24	8	32	
4-6	3	12	1	4	
6-9	2	8	–		
10 or more	–		1	4	
Cylindrical Grinding Machines					
1-3	4	16	8	32	
4-6	–		–		
6-9	–		–		
10 or more	–		–		
Tool Grinding Machines					
1-3	8	32	7	28	
4-6	–		–		
6-9	–		–		
10 or more	–		–		

(8) Raw Materials Used by Source

According to surveyed firms, locally available raw materials consisted of steel and aluminum.

Most raw material needs, however, were met through indirect purchases of imports. These included: alloy steel, special steel, mild steel, cold-rolled steel, steel plate, and M.S. plate aluminum.

Machine steel was imported directly.

(9) Subcontracting Activities and Processes Subcontracted

80% of the firms were engaged in subcontracting, while the remaining 20% were not.

Specific production processes being subcontracted included electroplating (70% of the surveyed firms), machining (65%), heat treatment (55%), press work, die sinking, planing and grinding work, instrumentation hardening, and die casting (35%).

(10) Sources of Funds

The firms surveyed had multiple sources of funding. Among the sources identified, reinvestment of profits (52%) was the most frequently mentioned, followed by private commercial banks (44%) and informal sources (36%).

(11) Incentives

(11)-1 Awareness of Incentives

Awareness and Availability of Incentives

Incentive	Awareness				Availability			
	Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%
Income Tax Holiday	8	32	17	68	1	13	7	88
Tax Deduction for Labor Costs	1	4	24	96	1	100	–	–
Tax and Duty Exemptions for Imported Capital Goods	5	20	20	80	2	40	3	60
Tax Deduction for Domestic Capital Goods	5	20	20	80	–	–	5	100
Exemption of Contract Duty	2	8	23	92	–	–	2	100
Tax and Duty Exemptions for Imported Materials Used in Export Products	2	8	23	92	1	50	1	50
Tax Exemption for Imported Parts of Capital Goods Used in Bonded Factories	3	12	22	88	2	67	1	33
Streamlined Import Procedures	2	8	23	92	1	50	1	50
Utilization of Bonded Factory/Warehouses	3	12	22	88	1	33	2	67
Exemption of Export Tax, Surcharge, Demurrage for Non-traditional Export Goods	2	8	23	92	–	–	2	100

(11)-2 Effectiveness and Availability of Incentives

Effectiveness and Availability of Incentives

Incentive	Effectiveness				Availability			
	Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%
Income Tax Holiday	1	100	–	–	1	100	–	–
Tax Deduction for Labor Costs								
Tax and Duty Exemptions for Imported Capital Goods	1	50	1	50	1	50	1	50
Tax Deduction for Domestic Capital Goods	–				–	–	–	–
Exemption of Contract Duty	–				–	–	–	–
Tax and Duty Exemptions for Imported Materials Used in Export Products	1	100	–				1	100
Tax Exemption for Imported Parts of Capital Goods Used in Bonded Factories	2	100	–				2	100
Streamlined Import Procedures	–	–	1	100			1	100
Utilization of Bonded Factory/Warehouses	1	100			1	–		
Exemption of Export Tax, Surcharge, Demurrage for Non-traditional Export Goods	–	–	–	–	–	–	–	–

(12) Joint Ventures with Foreign Capital Firms

76% of the surveyed firms indicated interest in developing joint ventures with foreign companies for mold and die manufacture.

Among firms indicating interest, the main attraction, or expectation, was technology transfer, followed by access to financing and overseas market development. Other expectations included on-the-job training and management know-how.

A little more than one-half, or 56% of the surveyed firms, expressed interest in technical tie-ups with foreign companies. Three surveyed firms suggested technology transfer in general, while two specified technical tie-ups in the form of supplying machines such as CNC and EDM required in mold and die manufacture.

II. Users Without Mold and Die Shops

1. Company Profile

(1) Year of Establishment

Over one third (35%) of the sampled firms categorized as users or purchasers of molds and dies for in-house use were established during the period 1976 to 1980. Significantly, about one third also started operations during the 1980s. Only 22% have been in business since before 1975.

(2) Paid-Up Capital

A majority of the sampled firms had capitalization of less than P50 million. Only 17% had capitalization of over P50 million, signifying that the majority of mold and die user firms fall into the medium-size corporate bracket. About 26% of these firms have less than P20 million in assets. The remaining 22% were unwilling to disclose the size of their assets.

(3) Main Products

Products within this category are mostly durable consumer goods. Firms could be classified into those engaged in the manufacture of automotive parts, the assembly and manufacture of transportation equipment, and the manufacture of appliances, metal products, and electronics products.

(4) Total Number of Employees

Total Number of Employees

Total Number of Employees	No.	%
Less than 50	4	17
50-100	5	22
101-500	6	26
501-1,000	3	13
More than 1,000	4	17
No Response	1	4
Total	23	100

Number of Mold and Die Related Employees

Number of Mold and Die Related Employees	No.	%
None	11	48
1-5	5	22
6-10	2	9
11-15	0	0
16-20	2	9
More than 20	3	13
Total	23	100

(5) Types of Molds and Dies Used

Stamping equipment seems to be the most common machinery in use. This was indicated by a majority (57%) of the respondents. Other frequently used varieties are small press dies of less than 150 tons (48%) and very small dies of less than 50 tons (43%).

Only 22% of the responding firms used large press dies of more than 500 tons. Progressive types were also used by 22% of the respondents.

(6) Annual Turnover

Annual Turnover

Main Products	Annual Turnover	
	1989 (P Million)	1990 (P Million)*
1. Metal Parts, Plastic Injection	84	
2. Appliances (TV, Karaoke, Radio)	11,294	1,734
3. Electrical Circuit Breakers	135	25
4. Motorcycle & Motor Parts	210	65.9
5. Disk Drives, Base Frames	2.1	6
6. Pole Lines & Metal Equipment	5	700
7. Steel Wheels	4.5	9.5
8. Dropside Trucks/Jeepneys	16.8	9
9. Trucks/Buses	800	100
10. Steel Fabrication	150	50
11. Aluminum Wares	5	–
12. Refrigerators, Air Conditioners	–	–
13. Air Conditioner Parts and Components	10	12
14. Refrigerators, Freezers, Washing Machines	40	20
15. Silicon Diodes/Rectifiers	100	29

Note: * 1st quarter

(7) Exports of Molds and Dies and Main Overseas Markets

All users of molds and dies responded that they do not export molds and dies since it is not their primary field of business.

About 17%, however, export their main products to countries such as the United States, Saudi Arabia, Japan, Indonesia and Singapore.

(8) Plans for Business Expansion

A majority of the user firms (78%) indicated that they were not interested in going into or expanding mold and die making operations because this is not their main field of business. Of the 23 respondents, only five expressed a desire to expand or diversify into die processing in the future.

2. Analysis of Data

Evaluations of Molds and Dies

	Satisfied		Tolerable		Not Satisfied	
Aspect Evaluated	No.	%	No.	%	No.	%
Domestically-made						
Accuracy	6	26	7	30	1	4
Lifespan	6	26	8	35	1	4
Price	8	35	5	22	3	13
Delivery	7	30	3	13	4	17
Foreign-made						
Accuracy	14	61	3	13	–	–
Lifespan	14	61	3	13	–	–
Price	6	26	9	39	2	9
Delivery	8	35	5	22	4	17

III. Users with Mold and Die Shops

1. Company Profile

Year of Establishment

Year Established	No.	%
1960-1964	3	12
1965-1969	6	23
1970-1974	7	27
1975-1979	4	15
1980-1984	5	19
1985-1990	1	4
Total	26	100

Paid-up Capital as of 1989

Paid-up Capital as of 1989	No.	%
Less than P500,000	4	15
P500,000 to < P1 million	3	12
P1 million to < P5 million	7	27
P5 million to < P10 million	3	12
P10 million to < P20 million	2	8
P20 million to < P50 million	2	8
More than P50 million	2	8
No Response	3	12
Total	26	100

Types of Molds and Dies Manufactured and/or Used (Multiple response)

Types of Molds and Dies Manufactured and/or Used	No.	%
Large Press Dies (500 tons or more)	5	19
Medium-size Press Dies (150-<500 tons)	12	46
Small Press Dies (50-<150 tons)	18	69
Very Small Press Dies (less than 50 tons)	17	65
Diecasting	4	15
Forging	2	8
Progressive	12	46
Stamping	19	73
Other	6	23
No Response	6	23

Exports of Molds and Dies and Main Overseas Markets

Exports of Molds and Dies	No.	%
Yes	1	4
No	25	96
Total	26	100
Main Overseas Markets		
Singapore	1	
Malaysia	1	
Thailand	1	
Pakistan	1	
Iran	1	

2. Analysis of Data

Annual Turnover and Percentage of Molds and Dies

Annual Turnover and Percentage of Molds and Dies	No.	%
Annual Turnover (in pesos)		
Less than P1 million	4	15
P1 million-P9 million	8	31
P10 million-P19 million	4	15
P20 million-P99 million	–	–
P100 million-P199 million	2	8
More than P200	1	4
No Response	7	27
Total	26	100
Percentage of Molds and Dies		
1-20%	4	15
21-40%	2	8
41-60%	–	–
61-80%	–	–
81-100%	3	12
No Response	17	65
Total	26	100

Annual Exports and Percentage of Molds and Dies (1989)

Annual Exports and Percentage of Molds and Dies	No.	%
Annual Exports (in pesos)		
$180,000	1	4
P300,000	1	4
No Response/Not Applicable	24	92
Total	26	100
Percentage of Molds and Dies		
1-20%	–	–
21-40%	–	–
41-60%	–	–
61-80%	–	–
81-100%	1	33
No Response	2	67
Total	3	100

Destination of Manufactured Molds and Dies

Destination of Manufactured Molds and Dies	No.	%
For In-house Use		
1-20%	2	8
21-40%	–	–
41-60%	3	12
61-80%	–	–
81-100%	21	81
Sold to Specific Users		
1-20%	4	15
21-40%	2	8
41-60%	–	–
61-80%	1	4
81-100%	1	4
Sold on Job Order Basis		
1-20%	7	27
21-40%	–	–
41-60%	–	–
61-80%	–	–
81-100%	1	4

Source(s) of Technology for Mold and Die Manufacture (Multiple response)

Source(s) of Technology for Mold and Die Manufacture	No.	%
Buyer(s)	7	27
Parent Company	3	12
Independent Development	23	88
Affiliate Company	–	–
Other (including training and study at home and abroad)	1	4

Type of Equipment In Use

	New		Used		Unspecified	
Type of Equipment in Use	No.	%	No.	%	No.	%
General Purpose Machine Tools						
Lathes						
1-3	5	19	9	35	5	19
4-6	2	8	–	–	2	8
6-9	2	8	1	4	–	–
10 or more	–	–	1	4	1	4
Shaping Machines						
1-3	9	35	8	31	7	27
4-6	–	–	–	–	–	–
6-9	–	–	–	–	–	–
10 or more	–	–	–	–	–	–
Planers						
1-3	1	4	3	12	4	15
4-6	–	–	–	–	–	–
6-9	–	–	–	–	–	–
10 or more	–	–	–	–	–	–
Milling Machines						
1-3	6	23	8	31	4	15
4-6	3	12	1	4	3	12
6-9	–	–	–	–	–	–
10 or more	–	–	–	–	–	–
Drilling Machines						
1-3	8	31	7	27	6	23
4-6	1	4	2	8	–	–
6-9	–	–	–	–	2	8
10 or more	1	4	–	–	–	–

Type of Equipment in Use	New		Used		Unspecified	
	No.	%	No.	%	No.	%
Special Purpose Machine Tools						
Electrically Discharged Machines (EDM)						
1-3	4	15	3	12		
4-6	–	–	–	–		
6-9	–	–	–	–		
10 or more	–	–	–	–		
Wire Cut EDMs						
1-3	1	4	–	–		
4-6	–	–	–	–		
6-9	–	–	–	–		
10 or more	–	–	–	–		
Machining Centers						
1-3	3	12	2	8		
4-6	–	–	–	–		
6-9	–	–	–	–		
10 or more	–	–	–	–		
Copy Milling Machines						
1-3	3	12	6	23		
4-6	1	4	–	–		
6-9	–	–	–	–		
10 or more	–	–	–	–		
Surface Grinding Machines						
1-3	8	31	11	42		
4-6	–	–	1	4		
6-9	–	–	–	–		
10 or more	–	–	–	–		
Cylindrical Grinding Machines						
1-3	5	19	4	15		
4-6	–	–	–	–		
6-9	–	–	–	–		
10 or more	–	–	–	–		
Tool Grinding Machines						
1-3	6	23	8	31		
4-6	–	–	2	8		
6-9	–	–	–	–		
10 or more	–	–	–	–		

Interest in Joint Ventures with Foreign Companies

Interested in Joint Venture for Mold and Die Manufacture	No.	%
Yes	17	65
No	9	35
Total	26	100

Expectations of Joint Venture Partner

Expectations of Partner Firm	Ranking
Technology Transfer	1
Access to Overseas Markets	2
On-the-Job Training	3
Access to Financing	4
Management Know-how	5
Other (including raw material supply and machinery)	6

Interest in Technical Tie-ups with Foreign Companies for Mold and Die Manufacture, Specific Area of Tie-up

Interest in Technical Tie-up with Foreign Company	No.	%
Yes	15	58
No	10	38
No Response	1	4
Total	26	100
Area of Technical Tie-up		
Supply of Machinery and Equipment	2	13
Supply of Raw Materials	2	13
Carbide Dies	1	7
Automotive and Motorcycle Parts	1	7
Technical Know-how/High Precision Technology	3	20
No Response	3	20

Reasons for In-house Die Manufacture

Reasons for In-house Die Manufacture	No.	%
To Ensure Quality	21	81
Economic Reasons	20	77
To Ensure Prompt Delivery	15	58
Protection of Trade Secrets	12	46
Other (including inability to buy from abroad, develop technical capabilities, and ensure continuous updating of mold and die technology	4	15

Interest in Developing Company for Job-Order-Base Mold and Die Manufacture

Interest in Developing Company for Job-Order-Base Mold and Die Manufacture	No.	%
Interested	19	73
Not Interested	7	27
Total	26	100

Evaluation of Molds and Dies

	Satisfied		Tolerable		Not Satisfied	
Aspect Evaluated	No.	%	No.	%	No.	%
Domestically-made						
Accuracy	12	46	10	38	2	8
Lifespan	12	46	9	35	2	8
Price	12	46	10	38	2	8
Delivery	11	42	11	42	2	8
Foreign-made						
Accuracy	11	42	1	4	–	–
Lifespan	12	46	1	4	–	–
Price	3	12	3	12	6	23
Delivery	6	23	4	15	1	4

III-3. Programs and Policies for the Machinery Industry in Japan

(1) Introduction

Following is an overview of the evolution of Japanese government policy for the promotion of the machinery industry. There are some similarities with the current state of the machinery industry in the Philippines, and the policies which have been adopted over the years in Japan would also be effective in the Philippines today. It must be kept in mind, however, that the economic and international environments under which these policies were adopted differ significantly from the situation today. Although the material presented here should serve as useful sources for further work, these obvious differences will have to be taken into consideration when formulating policies for the present.

This report will cover Japanese machinery industry policy from 1955 through the early 1970s.

(2) Evolution of Promotion Policies

1) Introduction

In recognition of the fact that the machinery industry is a strategic industry responsible for national economic growth, the Japanese government has for many years devised elaborate policies for its promotion, centering around the Machinery Industry Promotion Act and the Electronics Industry Promotion Act.

Specifically, the Machinery Industry Promotion Act was established in 1956 with the following objectives: to promote the modernization of facilities and scrapping of outdated equipment as well as the improvement of production technology in the key machinery and common parts sector; and to give some semblance of order to manufacturing sectors and standards, which at the time were in a state of confusion due to the proliferation of newly-established small businesses.

This was followed in 1957 by the Electronics Industry Promotion Act, designed to promote the modernization of electronics industry facilities and technology and the commercialization of new technologies.

The Machinery Industry Promotion Act was revised once in 1961, to deal with the liberalization of trade, and once again in 1966, for the promotion of exports. Finally, an overall reevaluation of the basic program was carried out in 1968 in response to the liberalization of capital. The Electronics Industry Promotion Act was also extended in 1964 with the aim of promoting the development and production of electronics equipment for industrial use.

Based on these two sets of legislation, the government designated specific sectors of the machinery industry in which testing, research, and the rationalization of production were to be promoted. In addition, a vision was offered for the future, and the production infrastructure was reinforced with a total of ¥130 billion (=US$1 billion as of ¥130/US$. Hereinafter the same exchange rate is used.) in low-interest special financing provided by the Japan Development Bank and the Small Business Finance Corporation. Furthermore, cartels were established to promote rationalization of production. Export promotion efforts were also undertaken.

The first Machinery Industry Promotion Act lasted from fiscal 1956 through 1960. Designed to respond to the serious lag in development faced by small and medium-sized firms in the industry and to assist sectors related to basic components, the Act emphasized

1) the modernization of facilities, 2) the realignment of manufacturing sectors, and 3) the improvement of technological standards. Also during this period, the Small Business Cartel Act provided for the formation of "rationalization cartels" and "anti-recession cartels" and was applied to sewing machine manufacturers, and numerous export promotion policies were formulated. Also seen was the establishment of the Japan Consulting Institute, the Japan Machinery Design Center, and light machinery centers in JETRO overseas offices, the creation of an export guaranteed loss compensation system for plants, and the construction of the Sakura-maru, the first ship intended solely for use as a traveling trade fair for Japanese industry and paid for with profits from automobile imports. Furthermore, some company was established by law for the domestic production of YS-11 type transport aircraft.

The second Machinery Industry Promotion Act lasted from fiscal 1961 to 1965, and in response to the new liberalization of trade provided for the improvement of international competitiveness and the promotion of exports (included finished goods) through 4) the strengthening of corporate structure, via mergers and joint purchasing and production, and 5) the rationalization of production. During this period, the Small Business Modernization Promotion Act provided for the lending of capital by the Small Business Finance Corporation for the purchase of facilities and the establishment of an accelerated depreciation system. In addition, the Mining and Manufacturing Industries Technology Research Association was certified to increase the scale of research efforts, the Japan Development Bank provided delayed-payment funding as a means of promoting the development of heavy equipment, the Industrial Bank of Japan and the Long-Term Credit Bank of Japan provided financing for machinery-related domestic delayed payments in response to the liberalization of trade, an installment payment credit guarantee system was established for machinery with an investment of ¥200 million (=US$1.54 million) from the government budget, the New Technology Development Corporation was established, and some firm was founded to compete with IBM.

The third Machinery Industry Promotion Act lasted from fiscal 1966 to 1970. It included strengthening of the use of funds, in response to the liberalization of capital, and the formation of corporate groups and cartels, thereby accelerating industrial reorganization in key industry sectors as yet unable to compete on the international market. Also, in response to the prevailing labor shortage, the distribution system was streamlined as a hedge against inflation, and the Basic Plan for Technology Development and Promotion was formulated for the promotion of increasingly comprehensive and large-scale technology development.

Other structural reform policies introduced during this period included a tax credit system designed to promote exports, a tax on mergers in response to the liberalization of capital, institutional financing for structural reform of the auto industry, domestic technology promotion financing by the Japan Development Bank covering commercialization and prototype development efforts, tax credits for the scrapping of machinery and facilities, financing and guidance by the Small Business Promotion Corporation, and the Small Subcontractor Promotion Act, which attempted to remove some of the uncertainties faced by companies in this sector by improving order-making methods, etc.

In 1961, general tariff rollbacks proposed by President Kennedy at the so-called "Kennedy round" of trade talks went into effect. Furthermore, sectors covered by voluntary export restrictions were extended to include binoculars, sewing machines, ball bearings, radios, televisions, bicycles, batteries, cameras, thermometers, textile machinery, machine tools, automotive parts, and used automobiles. The establishment by law of the Technology Promotion Agency, Japan was yet another of the many measures taken during this period.

The Electronics Industry Promotion Act was first implemented in the years from fiscal 1957 through 1963 for the Japanese electronics industry, riding the leading edge of technological innovation and thought to require government assistance, as seen in the case of the industrialized nations. This Act was extended once for the period fiscal 1964-1970.

Beginning in the mid-1960s, however, the state of world affairs underwent drastic changes, and while the Japanese economy was achieving miraculous growth these changes were making life more difficult for the machinery industry. Some of the problems faced included 1) on the production front: a labor shortage, making necessary the introduction of labor-saving measures, and problems of plant location developing from increasing pollution awareness; 2) on the demand front: a decline in demand for durable consumer goods and the systematization and "informationization" of demand for capital goods; 3) on the technology front: the need for comprehensive, large-scale research in response to changing demand and the transition from a stage of copying to one of independent product development; 4) on the export front: a transition in foreign pressure for trade liberalization to an increase in the value of the yen, and the resulting problems of international harmony; and 5) on the corporate front: the need for structural reorganization and inter-industry cooperation brought about by internationalization, the systematization of demand, and the increasing scale of research efforts.

The role to be played by the machinery industry in terms of the Japanese economy and society was a great and changing one. Problems facing the industry from an international standpoint included a prevalence of small and medium-sized firms, a lagging behind in production equipment, poor productivity, and in particular a lack of investment in R&D. Consequently, the government in 1971 integrated the Machinery Industry Promotion Act and Electronics Industry Promotion Act in the Specified Electronics and Machinery Industries Promotion Act. This move came in recognition of the fact that, in the future, industry would move towards an integration of machinery and electronics. It was characterized by an emphasis on think tanks and research and development, and promoted a transition towards functional commercialization and demand-oriented industries.

For specified industry sectors, the government drew up development programs, secured funding, and provided introductions, in addition to instructing the rationalization cartels and assisting cooperation among large corporations.

With the 1970s, the industry-oriented approach of government policy came under revision, and public welfare was finally given priority with greater restrictions on corporate activities. In the case of automobiles, for instance, a tax based on vehicle weight and tax incentives for low-pollution vehicles were newly established together with a Japanese version of the "Muskie bill" providing for automobile emission regulations by the Environment Agency. In the field of home electric appliances, "consumer livelihood improvement monitors" were appointed to deal with complaints. Trial tests and on-the-spot inspections were carried out, the range of JIS standards was expanded, misleading representations of product quality were eliminated, sales on the installment plan were regulated, and manufacturers were required to keep spare parts inventories for discontinued models.

In the field of commerce, import duties were rolled back across the board as a part of efforts to maintain the prevailing yen rate. As a result, effective Japanese tariffs on machinery, with the exception of computers, ICs, aircraft and other non-liberalized items and certain small business-related products, are virtually all less than 10%, an extremely low figure by international standards. Voluntary export restrictions were implemented for calculators. In the field of plant exports, the Washington Agreement was signed by six industrialized nations concerning export trust conditions in order to prevent excessive

competition among themselves. In addition, GATT negotiations are underway on the elimination of non-tariff trade barriers.

One of the industrial policies implemented in response to this situation was the Small Business Preferential Treatment Act, established in order to save these firms from the impact of the granting of preferential duties to developing countries, which in turn was based on a decision made at the 25th anniversary assembly of the United Nations in 1970. In addition, improvements were made in the taxation and budgetary allocation systems to reduce the financial burden of antipollution facilities, and the Machinery Credit Insurance Act was revised to include lease credit insurance for machinery. The Regional Promotion and Redevelopment Corporation was created to promote concepts such as the introduction of industry in rural agricultural districts and the relocation of industry. Other tax and budget-related incentives were also provided for the relocation of the relatively pollution-free machinery industry from densely to sparsely populated districts.

In 1973, two sectors of the machinery industry, automobiles and heavy electrical equipment/home electrical appliances, were among the 11 fields designated for "oil crisis countermeasures," and government directives called for firms in these industries to cut oil and electricity consumption by 15%. On the other hand, the New Energy Technologies Research and Development Program, commonly referred to as the "Sunshine Program," was established with a budget of ¥2.4 billion (=US$18 million) amidst great fanfare.

2) First Machinery Industry Promotion Act

This act was established as follows.

The machinery industry is a critical sector with the greatest potential as an export industry and a key industry. Particularly when viewed in light of recent trends towards industrialization in developing nations in Southeast Asia and elsewhere, great expectations have been placed on future exports of Japanese machinery. In the previously established Five-year Plan for Economic Independence as well, a great deal of emphasis is placed on the development of this industry.

In order for the machine industry to fulfill this role, it will be necessary to promote the targeting of foreign markets and other direct export promotion measures, but on a more basic level it is also extremely important to carry out rationalization in the machinery industry itself, and to work towards improved technological standards and the establishment of a solid foundation for management. The ideal but natural result of such efforts would be an excess supply of high-quality, reasonably-priced machinery suitable for export.

From this standpoint, the Japanese machinery industry faces numerous problems which must be resolved. Specifically, although the industry expanded rapidly as an ammunition industry during the Second World War, facility improvements were neglected after the war, resulting in significant aging and outdating of facilities.

Consequently, technological standards now lag considerably behind those in the industrialized nations. Furthermore, a large number of companies have been haphazardly established, with the end result that each is producing small quantities of a large variety of items.

The machinery and related companies designated by the current legislation fall mainly in the foundation and parts sectors, which are among the weakest of Japan's machinery sectors and have the greatest need for rationalization. Most of the companies in these sectors are small and medium-size businesses, and in this sense the current

legislation has grat significance as a constructive and aggressive promotion policy for small machinery manufacturers.

Basic Rationalization Programs are to be established for each component and type of equipment. A first step will be the determination of rationalization objectives, including quality, performance, and production costs, by the end of fiscal 1960, to be followed by the establishment of various measures deemed necessary to achieve these goals, such as the modernization of facilities, the establishment of dedicated production systems, the unification of standards, and the improvement of production technologies.

Three main measures have been adopted in the current legislation in order to realize the above objectives: securing of necessary funds for facility modernization, guidelines for the development of rationalization cartels, and the adoption of official standards for the improvement of production technologies.

Concerning the funds required for facility modernization, the Japan Development Bank in 1956 will provide ¥1.5 billion (=US$11.5 million) in low-interest, long-term loans having relaxed collateral requirements.

The guidelines for the development of rationalization cartels are designed to promote specialization of production fields, unification of standards, and joint purchasing of parts and raw materials. A guideline system has been specially provided taking into account the unique characteristics of the machinery industry and based on the principle that the government will be responsible for supervising the Basic Rationalization Programs. Consequently, the items on rationalization cartels laid out in the current Antitrust Law will be taken one step further to include restrictions on product types and the specifications of parts. Furthermore, there will be restrictions on production volume for each product and aggressive conclusion of cartel activities such as the joint purchasing of parts and raw materials in an attempt to promote rationalization in the industry.

The standards for the improvement of production technologies should cover not only the facility modernization plans set out in the Basic Rationalization Programs but also include specific standards for production facilities, inspection facilities, and manufacturing methods to be adopted by individual companies. In addition, concrete objectives for technological improvements at the factories of each company are to be indicated, and further efforts by the concerned industry sectors are expected.

The present legislation is to be a five-year plan combining the basic Basic Rationalization Programs with the Five-Year Plan for Economic Independence. Consequently, it will be a provisional act effective for five years, and during this time the government is to expend all of its efforts in an attempt to achieve the specified objectives.

Incidental resolutions in the Upper and Lower Houses of the Diet were as shown below.

*Incidental resolution, Commerce and Industry Committee, House of Councilors, April 17

Small and medium-sized businesses, which are not eligible for financing under the present legislation, may find themselves unable to compete with larger corporations. During implementation of this legislation, therefore, the government must work to provide such companies with adequate financing and other means of assistance, thereby making possible improvements in the technological standards of the industry as a whole to achieve improved product quality and reduced manufacturing costs.

*Incidental resolution to the draft of Machinery Industry Promotion Act, Commerce and Industry Committee, House of Representatives, May 29

During implementation of the present legislation, the government should provide the measures necessary to quickly achieve the following objectives, taking into account the present and future importance of the machinery industry to Japanese industry as a whole.

(1) In the formulation of rationalization measures, those involved must work to achieve interchangeability in light of the unification of standards (for components in particular).
(2) In addition to securing the funds necessary for implementation of the present legislation, the government must also work to secure necessary funds for the modernization of facilities in non-specified industry sectors.
(3) The government should establish a comprehensive set of machinery-related policies and use this as a means of expanding sales channels for machinery. Measures which should be taken to this end include shortening of the depreciation period for general industrial equipment and facilities, expansion of technological research institutes, and active assistance for export promotion.

3) Specified Electronics and Machinery Industries Promotion Act

This act was established as follows.

The machinery industry has recorded steady development as the backbone of Japanese industry. Recently, however, changes in the economic environment such as the internationalization of the economy (the liberalization of capital, to begin with) and a worsening labor shortage have been complemented by rapidly increasing social demands concerning pollution and safety. Consequently, a new set of policies is needed in order to respond to these economic and social needs.

The establishment of a machinery industry policy capable of meeting the economic and social needs of the 1970s will require the improvement of production technology and the rationalization of production in specified electronics and machinery industries. Thus the present legislation was proposed as a successor to the previous Machinery Industry Promotion Act and Electronics Industry Promotion Act.

Sectors to be promoted under the current legislation will be selected by the government as follows: those electronic equipment sectors requiring promotion of testing and research, the commencement of commercial production, or the rationalization of existing production; and those machinery sectors requiring the promotion of testing and research or rationalization of production in order to contribute to pollution prevention, preservation of the environment, labor conservation, technological innovation, and the reinforcement of the industry infrastructure. Specified sectors will be eligible for the promotional measures described below.

The competent Ministers will formulate and announce the development programs, which are to form the basis of efforts to promote improved production technology and rationalized production in the specified electronics equipment and machinery sectors. During the formulation of these programs, special consideration will be given to the integration and systematization of electronics and machinery, in light of the increasing interdependence of different industry sectors and of machinery and electronics equipment in particular.

Concerning the measures necessary to achieve the goals of the development programs, the current legislation is to include guidelines for the implementation of

rationalization cartels, advice concerning the commencement of large-scale operations, and finance and taxation-related measures.

Concerning the guidelines for rationalization cartels, the programs provided for in the prior Machinery Industry Promotion Act and the Electronics Industry Promotion Act will be continued in view of the unique characteristics of the machinery industry. Their operation will be handled very carefully in accordance with the spirit of the Antitrust Act, and necessary restrictions enforced.

In cases in which the commencemence of large-scale operations or the expansion of existing operations could have a highly adverse effect on the efforts towards joint operations or a similar impact on the healthy development of the national economy, the government shall have the right to offer advice concerning the modification of the plans to the company in question.

In the area of finance and taxation, the government shall work to secure and distribute the funds necessary for implementation of the development programs and provide special tax incentives in the case of mergers, etc.

Concerning questions regarding the Electronics and Machinery Industries Council, in order to achieve the effective implementation of the current legislation, the Machinery Industry Council and the Electronics and Information Processing Promotion Council will be reorganized, and the Electronics and Machinery Industries Council will be established and actively utilized. Deliberations concerning this council will be conducted when guidance is given on the establishment of laws for the specified industry sectors, the formulation of the development programs, and the implementation of joint activities.

The current legislation will be in effect for seven years.

Precautions will constantly be taken to ensure that implementation of the present legislation does not restrict fair competition in the marketplace. Furthermore, an incidental resolution stating the need for appropriate measures on the following points was attached.

(1) In accordance with the liberalization of capital, this legislation should be effectively utilized to improve the technology development capacities and the rationalization of production at firms in the electronics and machinery industries. In addition, appropriate measures should be taken with respect to foreign capital, e.g., to prevent confusion caused by the influx of foreign capital.
(2) During implementation of the development programs, emphasis should be given to the reinforcement of small and medium-sized companies, and efforts made to secure the necessary funding therefor.
(3) In order to ensure fair deliberations at the Electronics and Machinery Industries Council, adequate consideration should be given to the appointment of council members, organizational structure, and the management of meetings.

(3) Tax, Budget, and Industry Policy for the Machinery Industry (as of 1970) (Extract)

I Industrial Structure

1. Taxation
1) Special deduction of corporate income tax in the case of corporate mergers (Special Taxation Measures Law)
2) Special tax exemptions for mergers and joint investment based on the Specified Electronics and Machinery Industries Promotion Act

3) Special tax exemptions for mergers and joint investment based on the Small Business Modernization Promotion Act
4) Special depreciation system for key industry rationalization machinery, etc.
5) Exemption of import duties for key machinery

2. Treasury Investment and Loan
1) Special financing based on the Specified Electronics and Machinery Industries Promotion Act (Small Business Finance Corporation, Japan Development Bank)
2) Financing for the passenger car industry (Japan Development Bank)
3) Financial underwriting for joint operations in specified machinery industry sectors

3. Restrictions on New Operations
1) Restrictions based on the Airplane Manufacturing Act
2) Restrictions based on the Weapons Manufacturing Act
3) Restrictions based on the Measurement Act
4) Advice concerning joint operations based on the Specified Electronics and Machinery Industries Promotion Act

4. Joint Activity and Price Stabilization Measures
1) Joint activities based on the Specified Electronics and Machinery Industries Promotion Act
2) Open sales system for steel

II Modernization and Stabilization of Small Business

1. Taxation
1) Accelerated depreciation of machinery, etc. based on the Small Business Modernization Promotion Act
2) Special depreciation system for small business rationalization machinery, etc. (Special Taxation Measures Law)
3) Special deductions for small business structural improvements reserves and joint facilities for structural improvements activities (Small Business Modernization Subsidy Act)

2. Treasury Investment and Loan
1) Modernization financing based on the Small Business Modernization Promotion Act (Small Business Finance Corporation)
2) Lending based on the Small Business Modernization Subsidy Act (to be locally administered)
3) Subsidies for small businesses by the Small Business Promotion Corporation (Small Business Promotion Corporation)

III Technological Promotion

1. Taxation
1) Special depreciation for domestic production firsts
2) Special depreciation of equipment for new technology enterprises (Special Taxation Measures Law)
3) Special measures for the Mining and Manufacturing Technology Research Association (Mining and Manufacturing Technology Research Association Act)
4) Tax credits for cases in which testing and research costs increase
5) Income tax credits for technology exports

2. Government Expenditures, Treasury Investment and Loan
1) Large-scale industrial technology research and development program (large-scale projects) (budgetary outlays)

2) Local technology promotion funds (Japan Development Bank)
i) New technology enterprise program
ii) Heavy machinery development promotion program
iii) Commercialization testing and financing program
3) Important technology research and development cost subsidy program (government expenditure)
4) Technology improvement cost subsidy program
5) Funds for promoting local production of nuclear power equipment (Japan Development Bank)

3. Introduction of Technology (Foreign Investment Law)

4. Industrial Standardization Act (JIS)

IV International Policy

1. Taxation
1) Foreign market development reserve
2) Accelerated depreciation on exports for firms contributing to exports
3) Foreign investment loss reserve

2. Government Expenditures, Treasury Investment and Loan
1) Heavy Equipment Technology Consulting Project (Japan Consulting Institute)
2) Light Equipment Export Promotion Project (JETRO)
3) Machine Tool Export Promotion Project (Japan Machine Tool Export Promotion Association)
4) Automobile Components Export Promotion Project (Automobile Components Center)
5) Promotion of machinery exports (JETRO, Japan Machinery Center)
6) Export/import financing (Export-Import Bank of Japan)
7) Lending of economic cooperation funds (OECF)

3. Insurance Programs
1) Export insurance program (Export Insurance Act)
2) Plant export guaranteed loss compensation program (Japan Consulting Institute)

4. Restrictions
1) Voluntary export restraints
2) Design restrictions

5. Foreign Capital Introduction (Foreign Investment Act)

V Distribution and Consumption-Related Measures

1. Taxation
1) Computer buyback loss reserve

2. Government financing
1) Delayed payment financing for machinery (Industrial Bank of Japan, Long-Term Credit Bank of Japan)
2) Financing for computer rental (Japan Development Bank)

3. Insurance Programs
1) Credit insurance program for machinery (Machinery Credit Insurance Act)
i) Installment payment/loan guaranteed sales credit insurance
ii) Credit insurance for the lease of machinery

III-4. JETRO *Report on Implementation of the Cooperation Program for Fostering Small and Medium-Scale Die Manufacturers in Malaysia,* **March 1990** (Extract)

Introduction

This report offers a record of the activities of the plastic molds trainees invited to Japan and the plastic molds experts dispatched from Japan to Malaysia as part of the Cooperation Program for Fostering Small and Medium-Scale Industries, undertaken by JETRO in 1989.

In the present program, based on requests from the Standards and Industrial Research Institute of Malaysia (SIRIM), guidance for Malaysian trainees at die making factories in Malaysia was conducted in the form of a job training program, and eight Malaysian die manufacturers were visited by Japanese experts over a period of one month. The results of the Study on Industrial Sector Development Program, previously conducted at the request of the Malaysian government, gave information concerning the die making industry and firms, and the present program was based partly thereon.

Report by the Japanese Experts

Teruhisa Yonamochi, Yonamochi Mold Engineering Co., Ltd.
Shuichi Kurozumi, DSK Corporation

A) Introduction

The 1990 Asian Cooperation Project contains numerous innovations over previous programs and offers great promise. Specifically, each Malaysian firm was provided with two to three days of technical guidance and advice based on the comprehensive development programs for the industrial development survey carried out by JETRO-JICA in 1988.

In previous programs, seminars were held together with brief company visits (two to three firms in a day) for guidance. This format was used for the last ten years, and was in fact quite favorably received. Particularly in those districts lagging behind in technology and having few opportunities to absorb large amounts of information on a single occasion, these seminars provided an excellent opportunity for the absorption of specific technical know-how, and the need for such seminars continues.

After reaching a certain stage of development, however, across-the-board, theoretical discussions of the type found at such seminars could no longer deal with actual problems faced by individual companies. In some cases, representatives were reluctant to ask questions for fear of disclosing company secrets, and we as well found that there were few opportunities to interact directly with floor technicians and operators.

From the standpoint of providing large quantities of information at once, the new method of extended company visits was not particularly efficient, and it also invites the possibility that unbalances will develop within the industry due to the limited number of firms we can access. However, depending on the degree of aquired technology and the frequency of the requests, individual case studies are definitely necessary.

B) Results of Individual Company Guidance

Detailed individual evaluations will be left to the "Company Surveys and Guidance Report" prepared in advance, with a general evaluation to be presented here. As it represents our overall impressions and thoughts, the various elements are listed in no particular order or association.

(1) Workers often knew only the names of forming materials without any knowledge of their properties and characteristics, resulting in fabrication mishaps as early as the design stage.

-- We began with an overview of basic material science (differences between crystalline and non-crystalline materials, etc.) and then discussed the influence of these properties on design.

(2) Financial constraints often forced firms to rely on low-priced equipment suffering from poor mechanical precision; this was exacerbated by improper, and sometimes dangerous, methods of operation.

-- The difference between up cuts and down cuts during milling was not understood.
-- The main bearing thickness of the milling machine was ignored, and cutting was being conducted with excessive loads. This resulted in increased gaps between the various mechanical components, lowering precision.
-- During electrodischarge machining, the working fluid was simply sprayed onto the workpiece, presenting the danger of fire. One fire was actually witnessed (this at a factory to which a warning had been issued two years ago).
-- Neither surface grinders nor mold grinders were equipped with grinding stone balancers, and since grinding was being done with dressing alone there was marked roughening of the workpiece surfaces.
-- There was little awareness of the need for maintenance, resulting in shortened equipment lifetimes.

(3) Companies have a tendency to pursue sophisticated technology with no thought to their current technological levels. (This may be an improvement, however.)

-- Companies were using unreliable equipment without understanding the use of hot runner systems and with no regard to the need for delicate processing in the case of electrodischarge.

(4) No distinction was made in plant facility layouts between press dies and plastic molds. Furthermore, companies were uncertain as to what type of equipment they should purchase in the future.

-- One company which had only recently begun plastic molds manufacturing asked us what type of facilities would be best for its situation. We gave suitable advice as well as suggesting the general priority with which equipment should be purchased.
-- We also suggested points to consider concerning plant layout when the current plant is relocated in the near future.

(5) Due in part to the current state of undersupply in the market, there is little awareness of the need for cost management.

-- In some cases, those filling out the questionnaires were unable to understand the meaning of the term "cost breakdown." In other cases, the statistics needed for individual calculation were seldom available.
-- We held basic lectures on the principles of cost analysis, methods of cost computation, and production process management techniques.

(6) There is a lack of efforts among company owners to prevent job-hopping.

-- The movement of plant floor operators is particularly great around the lunar New Year. It appeared, however, as though owners were doing nothing to stop this. (The prevailing philosophy was that "they'll quit no matter what we do.")
-- True, there is no magical elixir for preventing job-hopping. We suggested, however, that owners work to give their employees pride and an understanding of the significance of their jobs, in addition to treating them well, in order to maintain a stable labor-management relationship. Naturally, wages should be given the greatest priority in any such efforts, but we wanted the owners to understand the "something" that has to come first.

(7) There was a disturbing lack of peripheral equipment, tools and jigs for die fabrication.

-- Due to a lack of understanding concerning tools, grinding stones, sandpaper, and other implements used in the polishing operation in particular, virtually none of the companies possessed these items.
-- A demonstration conducted with polishing tools brought along on the trip proved extremely effective in waking companies up to the potential benefits of such tools.
-- There was little understanding of the 3R one-touch system for use in electrodischarge machining, and considerable time was being wasted in the setting operation.

(8) No education was being conducted to improve technology and skill levels.

-- Both in-house and outside training remain insufficient. Although this depends on the quality, experience, and will of the owner, appropriate measures should be taken immediately.
-- Technical training must be complemented by training in concepts such as 5S, PM, and QC (in terms of the Japanese experience). A great majority of the die manufacturers were unable to carry out even a bare minimum of plant, arrangement, and cleaning, this in an industry in which precision is the ultimate objective.
-- There was little awareness of the need for "precision," with most work being done with the attitude of "as long as it gets done." As long as this attitude prevails, there can be little hope for improvements in precision.

(9) There is little to no awareness of the need for safety, sanitation, and insurance.

-- There is a lack of safety-related education within the plant, resulting in a situation in which employees are working in a dangerous environment, with numerous potential accidents "waiting to happen."
-- In our visits to the companies, we stressed the need for a safe working environment and the methods by which such an environment could be achieved.

(10) There was a lack of polishing skills.

-- As was made clear in the study of two years ago, there was little awareness of the need for polishing and a serious lack of basic polishing know-how. We emphasized this in our visits and were especially thorough at SIRIM, which is responsible for providing companies with guidance in this area. When polishing skills reach a certain level, it is thought that Malaysia's molds for plastics will undergo a marked improvement.

(11) There was a general inability to apply principles and theory to actual situations.

-- One thing strongly felt during the current visits was the lack of sufficient training in the application of theory and concepts. Even when we provided the solution for a given problem, for instance, no use was made of this as a basis for further work.

-- In other words, since most companies and employees have in mind only the most immediate of solutions, a minor change in the problem scenario is enough to throw them off course. They have become used to having things, or answers, "given" to them and find it difficult to proceed beyond that point on their own. (The questions were not that difficult.)
-- This situation requires urgent consideration, and it is not limited to Malaysia alone. What these companies, and countries need is development by their own efforts, and our task for the future is how to help them achieve this.
-- We were often surprised by the excellent ideas concerning small points coming out of these companies. In our minds, at least, this only reinforced the need for the type of training described above.

III-5. Training Courses for Metal Engineering and Die Making Industry in the Philippines

(1) MIRDC (Metals Industry Research and Development Center)

An R&D organ under the jurisdiction of the Department of Science and Technology (DOST).

<Course title>

Tool and Die Trainers Training Program

<Participants>

MIRDC staff	10
Private sector	5

<Contents>

Basic: Repair & fabrication of spare parts, stamping dies, die casting & forging.
Advanced: Plastic molding

<Instructors>

Italian	1	
Philippine	5	(in principle, engineers with at least 15 years of experience in manufacturing dies).

For instructors, a training program is offered in Japan.

(2) MIAP (Metalworking Industries Associations of the Philippines, Inc.)

An industry organization for the metalworking industry. Established in 1978. Membership: 224 firms (as of November 1989).

<Course title>

Tools & Die Maker Upgrading Program.

<Participants>

18-20 persons

<Contents>

Persons having a minimum of two years' shop experience as a machinist or tool & die maker or the equivalent will be able to [1] learn to interpret tool & die drawings, [2] familiarize themselves with and eventually select appropriate/alternative tool & die materials and corresponding heat treatments, [3] measure and evaluate dimensions of tool & die parts and pressed products, [4] select and recommend appropriate dies in accordance with molding methods, [5] select and recommend appropriate shop processes for the production of dies, and [6] enhance work ethics. Specifically, the curriculum is as follows:

Subjects	No. of hours
• Blueprint Reading	16
• Shop Mathematics	8
• Tool & Die Materials	8
• Machine Shop Theory	16
• Other Metalworking Processes	8
• Heat Treatment of Tool & Die Steel	8
• Measurement	16
• Cutting Tools & Dies	24
• Bending and Forming Dies	24
• Drawing Dies	24
• Other Types of Dies	16
• Die Setting, Maintenance & Operations	8
• Work Ethics	8
Total	184 hours

<Method of instruction>

MIAP and Don Bosco instructors will give lectures, tests, and demonstrations and supervise field trips.

The program is being implemented under a grant from the West German GTZ (German Agency for Technical Cooperation).

(3) Dualtech Training Center

Established in 1982 by HSF (Hanns Seidel Foundation) and SEASFI (Southeast Asian Science Foundation, Inc.) with full funding from HSF. Courses such as "upgrading programs" and "technical skills training programs" in electromechanics are available for high school graduates.

The current course in electromechanics is regarded as a preparatory course for the die making course, which is set to begin in 1991. In 1995, the first class of 200 trainees will graduate from this course with the ability to design precision dies.

Currently there are 16 lecturers, including three instructors in the die making field. Their personal histories are as follows:

- One is now training in Singapore after initial training in West Germany.
- Another has five years' experience at a local mold manufacturer.
- The third is training at MIRDC in the morning and giving lectures at Dualtech in the afternoon.

This training center is characterized by an emphasis on practice, with a practice : theory ratio of 7 : 3. In the electromechanics course, for example, theory will be intensively studied at the training center for the first six to eight months, but in the remaining two years, four out of six days a week will be devoted to practical application in the factories of partner enterprises (a total of 125 firms, including Pilipinas Hino, Pilipinas Nissan, Motorolla, Telefunken, and Semicon, support the goals of the training and have expressed their willingness to accept trainees).

As for tie-ups between the training center and private companies, Dualtech holds special joint sessions on the curriculum with company representatives to bring about qualitative improvement of the curriculum. Partner enterprises have also established special programs for the acceptance of trainees.

(4) Meralco Foundation

A nongovernmental body established to train technicians, the Meralco Foundation provides the following three die making courses:

[1] Tool and die design

Persons with a grounding in machine design are able to learn machine design concepts centering around their application to dies. Upon completion of the course, the trainees are able to recognize various die parts for stamping and read die plans.

Contents of the program are as follows:

Subjects	No. of hours		
	Theory	Practical application	Total
• Shop computation	3.0	0	3.0
• Materials and processes	2.0	0	2.0
• Layout and measurement	2.0	4.0	6.0
• Safety, communication and work attitudes	2.0	2.0	4.0
• Trade technology Fundamental ideas, process analysis, strip development, computation of loads, press selection and design/drafting.	12.0	51.0	63.0
Total	21.0	57.0	78.0

[2] Tool and die maker

This course provides persons who have received basic on-the-job training in machinery factories or those with equivalent ability with an opportunity to receive thorough training in basic die making know-how and practice.

Contents of the program are as follows:

Subjects	No. of hours		
	Theory	Practical application	Total
• Shop computation	6.0	0	6.0
• Materials and processes	4.0	2.0	6.0
• Layout and measurement	4.0	2.0	6.0
• Blueprint reading	4.0	6.0	10.0
• Die technology	16.0	4.0	20.0
• Safety, communication and work attitudes	2.0	0	2.0
• Practical application	0	45.0	45.0
Total	36.0	59.0	95.0

At the Meralco Foundation, a Philippine instructor devotes himself to guidance in die making technology based on the belief that the die making know-how he acquired first through training in Japan and later at a Matsushita group company in the Philippines should not be kept within the firm but disseminated as much as possible.

Apart from lectures and practical skill lessons, the facilities use real materials and dies in training as well as for the production of orders from television component manufacturers and automakers in the Philippines. Trainees are required to receive on-the-job training at companies for a certain period. This is refered to as Dualtech System and

allows trainees to become accustomed to the needs and atmosphere of private industry and factories as well as to learn practical technology.

The existing facilities have been outgrown, and new ones are now under construction.

(5) Don Bosco Philippines

An Italian vocational institute established in 1953. The Don Bosco Technical College receives aid from the Italian government for facilities and instructor training. In addition, a Technical High School, Vocational Training Center, and Industrial Technician Center offer courses in electronics, mechanical engineering and computer technology.

The students at these organizations total about 3,400. Those students 16 years of age or older can be broken down as follows:

Skill training course (one year course)	100 (two 50-person classes)
Mechanical training course (three years course)	130
First year	60
Second year	40
Third year	30

(6) NMYC (National Manpower Youth Council)

A vocational training institute under the jurisdiction of the Department of Labor and Employment, the NMYC was set up in 1969 with a view to developing natural talent among young graduates. A leading government organ in the manpower development policy of the Philippines, NMYC is charged with a mission of [1] improving productivity and promoting employment through various kinds of training, and [2] working towards the qualitative improvement of the Philippine workforce.

The number of trainees who participated in NMYC training programs in 1988 totaled 180,000, including 42,000 for the industrial training program, 59,000 for the rural training program, and 80,000 for a joint program involving local governments and private organizations.

There is no die making course at present. However, a mechanical drafting course (limited to 14 participants) has been set up with the cooperation of Swisscontact (a Swiss-based foundation) as a preparatory course for a course in tool and die design scheduled to be begun as a pilot project in 1991.

In operation since February 1990, the mechanical drafting course has brought forth the following criticism from Swisscontact:

[1] The trainees have insufficient backgrounds in mathematics. It is not felt, however, that the standards of the lectures should be lowered to compensate for this.
[2] Instructors are often absent or late to lectures, resulting in a considerable waste of time. Instructors should be more serious about their duties.

Swisscontact also believes that, although the mechanical drafting course is experimental and thus cannot be expected to be perfect, consideration of the above-mentioned problems will require a consultative committee to supervise training methods.

Instructors for the die making course set to begin in 1991 will be required to have far greater qualifications than those in the current preparatory course. Accordingly, four

NMYC instructors are now being trained in die design at the Jakarta lecturer training center of Swisscontact.

NMYC received an EDM from Japan through JICA. This equipment has not been used for the past five years, however. NMYC explains that a die making course could not be set up due to a very small number of applicants, thus leaving the machine in disuse.

(7) IRTC (Integrated Research and Training Center)

The IRTC was reorganized from the former Philippine College of Art and Trade in 1982, now belonging to the campus of the National Technological University of the Philippines.

Most of the buildings and facilities were received in a grant from the Japanese government through JICA. Under a five-year technological cooperation program from 1983 to 1987, a total of 51 experts were dispatched from Japan for long- and short-term training of engineers in the Philippines. Also during this period, 19 IRTC staff members were dispatched to universities in Japan for training.

IRTC has a three-year technician course and a five-year engineer course that includes a mechanical engineering program. Facilities include machining centers and EDM, making it possible to manufacture dies, albeit small ones. A die making course has not been added to the curriculum, however, due to a lack of instructors.

IV. Wooden Furniture Industry

IV. The Wooden Furniture Industry

1. The Export Market for Wooden Furniture

1-1 Outline

According to United Nations statistics, the worldwide import market for wooden furniture (excluding the United States) was valued at US$10,853.02 million in 1987 and could be broken down as follows: chairs and chair components (SITC 8211), $4,738.3 million; and other wooden furniture and components (SITC 82192), $6,114.73 million. During the five-year period from 1983 to 1987, the former class of products experienced average annual growth of 18.1 percent, while the latter group grew at an annual rate of 12.4 percent, indicating the steady expansion of the world import market for wooden furniture. (See Table IV-1-1.)

According to Department of Commerce statistics, U.S. furniture imports in 1989 totaled $3,220.4 million, of which wooden furniture accounted for $1,970.4 million, making the United States a major importer of wooden furniture.

Excluding the United States, the leading importers of chairs and other wooden furniture were the European nations of France, West Germany, the United Kingdom, the Netherlands, Switzerland, Belgium, Luxembourg, and Norway. When limited to non-chair furniture, Saudi Arabia and Japan were also among the top importers. Japanese imports of chairs totaled $181.34 million in 1987, with imports of other wooden furniture amounting to $282.45 million, representing only about 4 percent of the world market. It should be noted, however, that Japanese imports have been growing at an average annual pace of 27 to 30 percent in the years since 1983, a significantly faster pace than in other countries.

In terms of exports, Italy and West Germany were the leading exporters in 1987, together accounting for almost 50 percent of all exports worldwide. The 12 nations of the EC were responsible for 74 percent of all exports of chairs and 80 percent of all exports of other wooden furniture in 1987 and posted average annual growth of 19 percent and 14 percent in the two categories during the period 1983 to 1987. Exports of chairs and other wooden furniture by the EFTA countries, responsible for about 10 percent of worldwide exports, also grew at an average annual pace of 17 percent.

The world export share held by Asian countries, including Japan, Hong Kong, and R. Korea, was very limited, amounting to only 6 percent and 5 percent in 1987 for the above two categories. However, remarkable export growth was recorded by the ASEAN nations. Indonesian exports of chairs grew roughly 20-fold, from $472,000 in 1983 to $9.32 million in 1987, while Thai exports of the same grew roughly 11-fold, from $5.4 million in 1983 to $62.31 million in 1987. In contrast, exports by the Philippines increased only 80 percent during the same period, from $12.47 million to $22.61 million. Regional exports of other types of wooden furniture grew less spectacularly due to problems of manufacturing technology and shipping. Exports by Malaysia, Indonesia, and the Philippines during this period grew from 3- to 4-fold. Shipments by the leading exporters in the region, Singapore and Thailand, increased slightly less than 2-fold during 1983-1987, representing an average annual increase of 10-20 percent, roughly on a pace with world export growth.

1-2 The Japanese Market

(1) Imports

Japanese imports of finished wooden furniture amounted to ¥65 billion in 1989, up 35 percent over the previous year. Imports of furniture components also grew 25 percent, to ¥10 billion.

The following is a breakdown of finished goods imports based on customs statistics and industry estimates:

Japanese imports of finished furniture in 1989

1. Chairs and related	34 percent
2. Desks and tables	23 percent
3. Shelving and cabinets (including unit and simple shelving)	21 percent
4. Kitchen furniture	5 percent
5. Beds	4 percent
6. Dressers and mirror stands	3 percent
7. Miscellaneous	10 percent
Total	100 percent

Legged furniture was by far the most common type of product, accounting for 57 percent of all furniture imports in 1989. Per-unit shipping costs can be significantly reduced by sipping in large quantities. Miscellaneous furniture, which accounted for 21 percent of all imports, tends to take up a great deal of space and hence can be very expensive to ship.

Furniture exports to Japan can be characterized by exporting region as follows.

Asian imports included numerous dining room pieces. Tables, cupboards, and dining room chairs were imported from Taiwan, Thailand, the Republic of Korea, Singapore, Indonesia, and China. Most of the products from Southeast Asia are produced under license based on designs provided by Japanese firms.

Imports from Europe included a large percentage of sofas and other living room furniture, with demand for this type of furniture growing together with the increasingly luxurious tastes of Japanese consumers. In the past, Scandinavian furniture with simple, linear designs and light tones was preferred, but recently imports of "classical" designs from the southern European countries, and particularly from Italy and Spain (because of low manufacturing costs), have been increasing. In general, European furniture manufacturers produce for the international market and provide for total interior decoration with a characteristic design. European products are characterized by unique designs and a high degree of functionality not found in Japanese furniture.

The Republic of Korea, Taiwan, Thailand and other Asian nations were responsible for 83 percent of all exports of wooden furniture components to Japan on a value base. (See Table IV-1-2.)

Imports of finished goods were handled mainly by trading firms and sales outlets specializing in imported furniture. Up-market products from Europe and the United States constituted the majority of finished wooden furniture imports. In addition, Japanese wooden furniture manufacturers sometimes import finished goods, as do department stores.

Since finished goods eliminate the need for processing and assembly in Japan, little investment is required. On the other hand, design modifications to suit the Japanese physique and housing situation are difficult to achieve, and the need for shipping results in increased costs and longer delivery times.

Most knock-down production of furniture is conducted between Southeast Asian countries. Frames processed in these lumber-supplying nations are imported for assembly and sale, mainly by furniture manufacturers. Virtually all of the larger Japanese furniture manufacturers are engaged in knock-down production, and some have established their own plants in Southeast Asia for the export of both components and finished pieces to Japan.

Knock-down production has numerous merits, including the following: 1) shipping costs are lower than for assembled pieces; and 2) manufacturing costs can be cut by taking advantage of the inexpensive labor and abundant lumber resources of the Southeast Asian region.

(2) Characteristics of the Japanese Market

The Japanese market can be broadly divided into three sectors: inexpensive products, mid-range products, and up-market products.

1. Inexpensive products
   The market for these products is characterized by high turnover rates and low profit margins. Typical sales routes include volume sales stores, large furniture store franchises, and direct mail operations. Southeast Asian products including knock-down ones account for most of the imports sold in this sector.
   Overstocked Japanese mid-range products are often discounted and distributed in large quantities as bargain products. Thus the prices of imports must be lowered even further in order to compensate for the difference in quality, placing them at a disadvantage.

2. Mid-range products
   Mid-range products are the most common in the Japanese furniture market. The majority of Japanese furniture manufacturers deal in mid-range products, and they form the backbone of product lineups at all firms. This class of products is characterized by large-variety, moderate-volume production in the case of household furniture and by large-variety, large-volume production in the case of business and government contract furniture. Most manufacturers specialize in either legged or miscellaneous furniture, with only a handful of the largest firms engaged in production of all types (this in contrast to the prevalence of "all round" manufacturers in other countries). As a result, rationalization of the production process has made possible thorough quality control and cost reductions, and prices are as low as or even lower than those of imports of similar quality.
   Recently, inexpensive products from Europe and the United States have made inroads into the mid-range market and are now being sold at department stores, volume sales stores, and smaller furniture retailers.

3. Up-market products
   The up-market segment is characterized by low turnover and high profit margins, with most products being distributed through imported furniture stores and department stores in the large cities.

Recently this segment has been growing due to improvements in the Japanese housing situation and a growing ratio of moneyed class. The market can be further divided into moderately expensive and very expensive goods, the latter being almost entirely of Japanese make.
Imports from Europe and the United States are destined primarily for the moderately expensive market segment. Most of these products are either traditional or innovative.

In addition to the three market sectors described above, there are two other important sectors, namely, the markets for business/government contract furniture and for "built-in" furniture to be used by housing corporations. The former is characterized by large orders and intense competition. The latter consists of "built-in" furniture found in new housing, such as cabinets and shoe cupboards. Housing corporations design and manufacture their products by themselves or in tie-ups with furniture manufacturers for sales through their own networks.

(3) Marketing Advice

Japanese society, lifestyles, and housing conditions differ from those in both Western nations and neighboring countries in the Asian-Pacific region, and these differences are strongly reflected in the marketplace. Success in the Japanese market therefore requires a thorough understanding of market needs, which can be obtained through market research, and efforts to satisfy these needs.

Important points for consideration, taken from past experiences with import transactions, are listed below.

1. Pricing
   Although willing to pay large sums of money for up-market furniture, Japanese consumers are sensitive to prices. Moreover, a full lineup of locally-made products, ranging from up-market products to components, is also available, and the prices of imports are always compared with Japanese products of the same level. Thus, thorough market research should be conducted before prices are determined.

2. Delivery schedules
   It is a rule in Japanese retail business practice that the product is to be delivered immediately upon establishment of the sales contract. As a result, imported furniture dealers determine delivery times to coincide with the selling season by taking into account the time required for shipment from the producing nation. Shipment delays can result in missing the selling season and failure to meet specified customer delivery dates, which in turn can result in the generation of claims. The ability to meet promised delivery schedules is thus an important point to be considered in any import transaction.

3. Processing of claims
   A large number of claims have been made concerning furniture imports. Problems related to materials and production technology have been especially common, with imported pieces often unfit for sale. This is the result of factors such as: (1) the sensitivity of Japanese consumers concerning product quality; (2) frequent cases of insufficient quality control in the exporting nation; and (3) a lack of care during shipment. It is important for exporters to take appropriate measures to prevent the generation of quality-related claims as well as to process rapidly those claims which are received.

4. Follow-up sales activities
   In Europe, annual purchases are determined at furniture fairs held throughout the region. In the United States as well, contracts are signed at periodically-held furniture marts. In Japan, similar fairs and exhibitions are held by producing regions and individual companies, but a lot of final agreements are reached through sales efforts following these exhibitions. Hence, follow-up sales campaigns are very important in Japan.

(4) Japanese Furniture Manufacturers' Interest in the Philippine Furniture Industry

In Japan, the common conception is that Philippine furniture equals rattan and cane furniture. Some in the furniture industry are even unaware of the fact that wooden furniture is produced in the Philippines, indicating a severe lack of information.

According to import statistics, the Philippine share of Japanese wooden furniture imports in 1989 was just 0.3 percent for assembled pieces and 1.0 percent for components. Meanwhile, Thailand posted figures of 9.8 percent and 19.9 percent, while Indonesia recorded figures of 3.5 percent and 2.5 percent. Thus, Philippine exports to Japan remain insignificant in terms of overall market scale.

The same result was indicated by a survey distributed in June 1990 to 104 Japanese wooden furniture manufacturers, most of them small and medium-sized companies, as part of the present Study. (For details see Annex IV-2.)

At present, ten of the firms responding to the questionnaire have established a total of 14 production operations in the Asian region. A breakdown of the operations shows Thailand to be the most common site, with six, followed by Singapore and Indonesia with two and China, Hong Kong, Malaysia and the Philippines with one each. The one company with operations in the Philippines uses its affiliate for consignment production and chose the country for its cheap and plentiful supply of labor. (See Table IV-1-3.)

Eight firms were currently considering investment in Asia. Potential sites indicated for the projects included Indonesia (four), Thailand (three), R. Korea (two), Singapore (two), and Malaysia (one). None of the firms indicated the Philippines as a potential investment site.

In general, evaluations of the Philippines as a production site were less than favorable. The following factors were pointed out by the surveyed firms as being responsible for this:

1. The Philippine furniture industry is geared toward the United States in terms of marketing. Producers do not modify the sizes and designs of products to suit the physique and tastes of Japanese consumers.
2. The furniture made in the Philippine is closely associated with rattan furniture. Does the country make wooden furniture? If it does, publicity for wooden products in the Japanese market is insufficient.
3. The concept of product quality in the Philippine industry is different from that in the Japanese industry. Nails are not visible on wooden furniture made in Japan. If processing precision is improved, jointing can be done without the use of nails or by using a method which makes nails invisible.
4. The Philippine industry imports metal fittings, cushions and other auxiliary materials and adhesives from Japan. There are few metal fittings, manufacturers in the Philippines and metal molds for making metal fittings are not produced locally. The country does not have sufficient background for wooden furniture production.

5. The political situation in the country is uncertain. Public order has deteriorated and the power supply is insufficient.

The following four factors were pointed out as being responsible for the popularity of Indonesia as an investment site:

1. The relaxation of restrictions on the activities of foreign capital corporations, including small and medium-sized investment projects, has improved Indonesia's reputation as an investment site.
2. An across-the-board ban on exports of unprocessed rattan and cane enacted by the government in October 1986 reduced the market advantage of Taiwan, which until then had been importing rattan pole from Indonesia for the production of rattan and cane furniture. As a result, Indonesia came to be recognized as a site for production of rattan and cane products rather than merely as a supplier of raw materials.
3. Labor costs are low.
4. Exchanges with Japan are being conducted in the form of technical training.

Each of the four firms indicating Indonesia as a potential investment site gave "availability of raw materials" as the leading reason for selection in preference to "labor availability," "labor costs," etc. In Indonesia, however, all lumber resources are managed by the state, and a stable supply of rare species of wood is not necessarily assured.

Reasons indicated by those firms choosing Thailand, the second most often-noted country, included "labor availability" and "labor costs," suggesting the expectations of these firms with respect to the country's abundant supply of cheap labor.

Concerning the Philippines, most of the responding firms either gave no answer or else indicated that they had "never imported from the Philippines," suggesting the low degree of interest among Japanese furniture manufacturers at present.

1-3 The U.K. Market

(1) Imports

U.K. imports of wooden furniture, including wooden chairs, totaled 602.03 million British pounds (292,000 tons) in 1989. Imports originating in EC nations accounted for 71 percent of the total on a value basis and 49 percent in terms of volume. In addition, inexpensive do-it-yourself products — mainly cupboards, wall shelving, and chests — and flat-pack pieces were imported from Eastern Europe and Southeast Asia. The import can be broken down as follows: bedroom furniture, 23.8 percent; kitchen furniture, 16.6 percent; chairs, 10.0 percent; office furniture, 8.0 percent; and miscellaneous items, 41.6 percent.

Wooden furniture for the bedroom includes bed frames, wardrobes, chests and other storage pieces together with mirror stands. Storage furniture is the most common import item, and most are unit pieces. The average price per ton of imported furniture was 1,102 British pounds. The figure for Denmark, the leading exporter to the United Kingdom in terms of value, was 2,338 pounds/ton, while the leading supplier in volume terms, East Germany sharing 50 percent of total volume, posted a figure of just 389 pounds/ton, indicating the low prices and semi-finished nature of products from East Germany.

Most of the imported wooden furniture for use in the kitchen consisted of knock-down cabinets designed to be sold in "flat packs," which are easy to ship. Imports from EC countries accounted for a larger portion of the total than with other types of furniture — 92 percent in terms of value and 79 percent in terms of volume. West Germany in particular was responsible for 46 percent and 35 percent of all U.K. imports, respectively.

Italy and other EC countries were responsible for 62 percent (value) and 38 percent (volume) of all U.K. imports of wooden chairs, with the unit price per ton being 4,856 pounds. This compares to a figure of only 1,810 pounds/ton for imports from Yugoslavia and other non-EC nations. There are deep-rooted consumer preferences for those products with a significant price gap between imports from EC and non-EC nations. For the living room, traditional and nostalgic designs are popular.

West Germany, Denmark, Italy and other EC countries are responsible for 75 percent (in value terms) and 70 percent (in volume terms) of all U.K. imports of wooden office furniture. In the market for inexpensive products, sales of veneer or otherwise laminated chip board or particle board products are growing rapidly. In the high-grade market, where furniture serves as a status symbol and appearance is tantamount, hardwoods are preferred.

(2) Design Trends

High-grade furniture in the U.K. market can be broadly divided from the standpoint of design into modern and classical pieces. The former group includes wooden and upholstered (with fabric or leather) furniture from Italy and Scandinavia together with plastic, steel pipe, chrome, and glass products. Classical furniture includes "middle of the road" wooden and upholstered (with fabric or leather) furniture together with mass-produced or handmade traditional pieces. Under the heading of traditional furniture can be found reproductions of Sheraton, Happle White, Regency, and Georgian styles.

In the market for inexpensive furniture, pricing is far more important than design, and only the most basic of functions are emphasized. For consumers in this sector, furniture style and overall external appearance are the most important design-related considerations. Modernity, safety, and harmony have only a secondary importance.

It should also be noted that there are numerous British Standards concerning safety and design applicable to all types of furniture.

(3) Characteristics of the U.K. Furniture Market

Most household furniture is sold through retail stores; more than 80 percent of all such furniture is shipped directly to retail outlets by manufacturers or importers. 7.5 percent goes through wholesalers, with a further 10 percent reaching the retailers through distributors of kitchen and bedroom furniture. These distributors commonly handle a variety of inexpensive import items. The remaining 1-2 percent of household furniture is shipped directly to retailers by Western European manufacturers. In the United Kingdom, imported furniture often passes through the hands of local furniture manufacturers. The local manufacturers will utilize their own marketing know-how and networks in order to promote sales of these products. (See Table IV-1-5.)

Sales routes which bypass the furniture retailers include discount stores, which have developed as franchises, and "do-it-yourself" stores, which act as retailers of do-it-

yourself and kitchen furniture. These stores handle low-priced imports and are becoming increasingly important as a new furniture distribution channel.

Furniture naturally differs according to the type of retailer. Department stores, for example, tend to maintain a large selection of relatively high-priced pieces. There are three types of furniture stores. Boutiques and similar stores, which spend large sums of money on their displays, are characterized by higher prices. Prices are lower at the factory direct retailers, and lower yet at the so-called "home assembly" shops.

Approximately 20 percent of all office furniture is shipped directly from the manufacturer to the end user. Manufacturers have their own sales organizations and also promote sales through catalogs, pamphlets, and trade and economic journals. Most direct sales involve contracts from the local and national government, state-owned corporations, large stores, and financial institutions.

More than half of the office furniture sold in the United Kingdom passes through the hands of retailers or wholesalers. In almost all such cases, the furniture is shipped to the retailer/wholesaler directly from the manufacturer. Retailers target primarily small and medium-sized businesses, while the wholesalers stock a wide variety of products and are capable of handling large orders.

Imported office furniture is usually sold by local manufacturers or distributors based on licensing agreements with the foreign manufacturer. Recently, however, an increasing number of foreign manufacturers are establishing their own distribution organizations without the assistance of local firms.

1-4 The U.S. Market

(1) Imports

The U.S. market for imported furniture totaled $3,320.4 million in 1989, accounting for approximately 30 percent of the entire household furniture market in the world.

The import situation has changed greatly during the last two to three years. In the past many U.S. manufacturers were critical of imports, but recently they have begun to import both parts and assembled pieces — in the form of OEM — mostly from countries in the Asian region.

According to Department of Commerce statistics, imports of wooden furniture (including office furniture) amounted to $1,970.4 million in 1989, with Taiwan responsible for 32.7 percent of this total, Canada for 14.0 percent, Italy for 8.7 percent, Yugoslavia for 6.1 percent, and Mexico for 5.8 percent. These five leading suppliers accounted for 67.3 percent of all imports. The share for the five ASEAN suppliers totaled 8 percent: Thailand, 3.1 percent; Singapore, 2.6 percent; Malaysia, 1.1 percent; the Philippines, 0.8 percent; and Indonesia, 0.4 percent. Recording the most rapid growth among this group were Malaysia, with an average annual increase of 103.1 percent during the period 1985-88, and Thailand, with average growth of 88.7 percent for the same period. (See Table IV-1-6 and IV-1-7.)

Leading supplier Taiwan currently faces a multitude of problems, including rising wages resulting from a labor shortage, a dependence on imported raw materials, problems with factory locations stemming from environmental and safety-related concerns, an appreciation in the value of the Taiwanese currency with respect to the

dollar, and removal from the list of nations with GSP status. Due in part to these factors, Taiwan is now trying to penetrate into the middle- and up-range markets.

The ASEAN nations are expected to expand their market share in the United States and Taiwan around lineups of low-priced and labor-intensive products. The main products in the U.S. imported furniture market (including rattan and cane furniture) for each of the ASEAN nations in 1989 will be described below. (See Table IV-1-8 and IV-1-9.)

Imports from the Philippines were valued at $123.3 million, of which rattan and cane furniture accounted for approximately three-fourths. Wooden furniture included chairs and a wide variety of other pieces. Shipments from Indonesia, most of which — like the Philippines — consisted of rattan and cane furniture, totaled $33.1 million. Indonesian wooden furniture included chairs, furniture components, and a variety of other pieces as well.

Chairs, dining tables, and other wooden furniture pieces were the main items imported from Thailand ($75,4 million), Singapore ($53.0 million), and Malaysia ($25.7 million). Other imported items include wooden kitchen furniture from Thailand, wooden furniture components and bedroom furniture from Singapore, and wooden furniture components from Malaysia.

It is thought unlikely that the Philippines will be able to maintain its current position in the U.S. imported furniture market through the 1990s.

Of the ASEAN nations, Indonesia is thought to have the greatest overall potential as a furniture exporter. It meets all of the basic conditions required for development of the furniture industry, including access to cheap skilled labor, abundant supplies of raw materials and energy, reasonable forest utilization policies that include a ban on the export of unprocessed materials, and the capital to devote to industrial development.

Further growth is also expected for the Malaysian furniture industry, bolstered by a ban on the export of raw lumber, an abundance of high quality hardwoods, a long tradition of hardwood craftsmanship, and low labor costs.

Thailand is thought to be in the best overall competitive position, with further development expected to accompany the construction of modern plant facilities designed for the production of Ready-to-Assemble (RTA) and mass-produced hardwood furniture.

(2) Channels of Import Transactions

Wooden furniture imports from the Philippines are generally conducted either through an importer/distributor or else directly by a large department store or chain. In addition to importing furniture components in large quantities for assembly in America, U.S. manufacturers also import finished products to be sold under their own brand names. Sales to important customers are made directly, while retailers are generally supplied via a wholesaler.

In the case of transactions by importers/distributors, major buyers are met with to determine product type, and meetings are then held with suppliers to negotiate price, shipment terms, and quality. Designs may be based on one of the supplier's standard specification or existing designs, made originally by the purchaser, made exclusively for the purchaser by the supplier, or made in a joint effort by the purchaser and supplier.