However, due to the lack of technical expertise in the country, the introduction of foreign capital and foreign technology is also considered an effective approach and promotion of the same is recommended. Capital and technological tie-ups between domestic investment companies and foreign companies are seen as promising.

Foreign capital should be introduced, it is recommended, focused on fields of kiln furniture where large amounts of demand are anticipated, such as saggars, shelving, and supports. A project for the production of durable kiln furniture using primarily Indonesian kaolin, magnesite and high alumina materials, including imports, could be expected to be profitable.

Such a project should preferably be located near the production centers of ceramic products. The "raw material and auxiliary material estate" would be most suitable site, if realized.

There are believed to be only small possibilities of investments by foreign capital into the fields of production of transfer paper and gypsum plaster molds judging from the amount of demand. As a more practical approach, promotion of technological tie-ups is recommended.

(2) Program 2: Construction of raw material and auxiliary material estate

Above, recommendations were made on industrial technological promotion measures for the raw material and auxiliary material sectors. Here, recommendations will be made for the improvement of the distribution system, another issue relevant to these sectors. As the most comprehensive and effective approach for establishing a stable collection and delivery system for raw materials and auxiliary materials, it is recommended, as a long-term key project, to construct an industrial estate designed to function as a comprehensive supply center for the same.

In this plan, the estate is envisioned as being located and functioning as follows:

[Location]

The most suitable location would be on Java island where the users, i.e., the ceramic products manufacturers, are concentrated. Central Java, which is positioned in the center of the triangle formed by the two metropolitan areas of Jakarta and Surabaya with their many product manufacturers and Bandung where various research and development institutes are located is considered the most suitable.

[Functions]

The following activities would mainly be handled in a centralized manner in the estate:

[1] Collection and delivery of raw materials produced in different areas of the country. Depending on need, adjustment and mixing of the materials.
[2] Production and sale of key auxiliary materials (concentrating above-mentioned auxiliary material manufacturers in one area).
[3] Sale of imported raw and auxiliary materials.

If such an estate is constructed, it could be expected to considerably relieve the problems arising due to the peculiar situation of Indonesia of the great distance between the raw material production areas and products manufacturers. The ripple effects would probably cover a wide area.

The products manufacturing sector would benefit by easier access to good quality raw materials and auxiliary materials and a wider selection of materials so that the conditions would be provided for greater stability of production, improvement of quality,

and reduced costs. In particular, the merits would be great for medium and small companies manufacturing tableware and novelties.

The raw material producers would benefit in that they could ship to a single centralized location and therefore would find transportation control easier. Also, the way would be opened for development of new customers and the conditions established for expansion of their business. In addition, the auxiliary material manufacturers would benefit in various ways such as the securing of operating sites, procurement of raw materials, and development of demand, with the environment for industrial development thus established.

In the long-term, further, the efficiency of inventory control of the ceramic industry as a whole could be expected to be vastly increased.

1) Objectives and Content of Estate

The estate is envisioned as serving as a base for the comprehensive and stable supply of raw materials and auxiliary materials such as graded raw materials, prepared body, glaze, saggars, and working molds.

The work required in establishing such a service system would be as follows:

a) Adjustment and supply of raw materials

[1] Refinement and stable supply of domestic materials;
The estate would grade, collect, and supply materials by refining clay materials and grinding and classifying stone materials.

[2] Import and supply of overseas raw materials;
The estate would import and supply necessary materials, including pigments.

[3] Adjustment and supply of prepared body and glazes;
The estate would adjust and supply special grade, grade 1, and grade 2 prepared body and glazes.

b) Manufacture and supply of auxiliary materials

[1] Manufacture and supply of kiln furniture;
The estate would manufacture and supply saggars, supports, shelves, and other kiln furniture required for firing.

[2] Manufacture and supply of plaster of paris moulds;
The estate would manufacture and supply working moulds. If necessary, it would also produce high grade plaster of paris.

c) Other facilities

[1] Inspection and Testing Facilities;
It is necessary to establish testing facilities for inspecting the quality of raw materials, prepared body, glaze, and auxiliary materials. Preferably service offices would be established by public research and development institutes and would be provided with the minimum necessary analytical and testing facilities.

[2] Communication Facilities;
It is necessary to establish telephone, telex, and facsimile facilities. It will be desirable to secure facilities exclusive to each company and also establish a business service room.

2) Facilities and Capabilities

The facilities and the collection and processing capabilities of the estate would be at the minimum those necessary for supplying the raw and auxiliary materials for tableware (including novelties) and sanitary ware. In the case of tile, most companies use raw materials around the factories so could not be expected to make much use of the

estate's materials.

Calculating the necessary facilities and capabilities under this concept, the following is obtained:

First, Table 2-6-3 shows a projection of the scale of production capacity of the ceramic product manufacturing industry based on the state of development of the past few years.

Table 2-6-3: Projection on Production Capacity (Planned) of Ceramic Product Manufacturing Industry

(Unit: tons)

	End of 1986	June 1988	June 1990	June 1995 (Projected)
Tableware	42,678	58,806	103,762	315,000
Sanitary ware	19,155	34,528	42,177	113,000

However, this projection on production capacity seems somewhat excessive. Further, not all the product manufacturing companies would use the estate, so it is judged that the supply capacity of the estate should be planned in anticipation that the initial demand would be about one-quarter to one-third of the projected production capacity showed above.

This plan is based on the assumption of one-third of the projected production capacity of June 1995.

Note that if an estate is actually built, it would of course be necessary to run a detailed survey and make corrections to the basic conditions set.

a) Processing capability

[1] Amount of processing of domestic clay materials

If the amount of prepared body (except kaolin) used for tableware and sanitary ware accounts for 20 percent of the materials as a whole, then 28,500 tons a year would be required. Depending in part to the amount of impurities mixed in the raw cray material, the amount of material for refining purposes would be 35,000 to 40,000 tons a year.

[2] Amount of collection of kaolin

The kaolin of Bangka and Belitung islands present problems in transportation so three months' supply should be collected and stored. If the amount of kaolin used is 30 percent of the necessary body, then it would come to 43,000 tons a year. A warehouse for storing three months' supply would be required.

[3] Processing capability of stone materials

If the amount of stone materials used is 35 percent of the required amount of body, it would come to 50,000 tons a year. If 20 percent impurities is anticipated, then a processing capability of 60,000 tons of stone materials a year would be required.

[4] Amount of collection of imported materials

Necessary imports would mainly be ball clay and plastic clay. These represent 10 to 20 percent of the required amount of body. Assuming an average 15 percent, a warehouse should be established for storing six months' worth, or 10,000 to

11,000 tons.

[5] Manufacturing capability of kiln furniture
The estate should mainly plan for production of saggars for tableware. The weight of the saggars should be three to four times that of the tableware. If the number of times used (lifetime) is 100, then 3,000 to 4,000 tons would be required a year.

[6] Manufacturing capability of plaster of paris moulds
The estate should mainly plan for production of working moulds for tableware. The weight of plaster of paris moulds is about four times that of tableware. If the average lifetime is 80 uses, then 5,000 to 5,500 tons would be required a year.

b) Summary of facilities
The facilities required for the manufacture of the raw materials mentioned in the preceding section would differ according to their respective objectives, but the main ones would be as follows:

[1] Processing facilities for clay materials
Raw clay supply facilities, centirifugation and magnetic separation facilities, clay pressing facilities, conveyance and transportation facilities, weighing facilities, etc.

[2] Kaolin collection center
Conveyance and transportation facilities

[3] Stone material processing facilities
Conveyance facilities, crushing and grinding facilities, screening and magnetic separation facilities, packing facilities, etc.

[4] Imported material collection center
Conveyance and transportation facilities

[5] Kiln furniture manufacturing facilities
Grinding and classifying facilities, kneading facilities, molding facilities, drying and firing facilities, conveyance facilities, etc.

[6] Plaster of paris mould manufacturing facilities
Vacuum kneading facilities, plaster of paris mould fabrication and finishing facilities, drying facilities, etc.

[7] Testing and inspection facilities
Chemical analysis facilities and other facilities necessary for inspection of the moisture content, viscosity, strength, particle size, firing, and other facets of quality.

3) Project promotion and implementation, operation and management of the estate
The preparations for and implementation of this project would require considerable time and fund. It is hoped that the public and private sectors would join together and work for its realization. It would be desirable that the later mentioned "policy coordinating function" be quickly established and that this be taken up as the topic of highest importance at that forum.

In the construction, operation and management of the estates, it seems that it would be practical for the Industrial Minerals Association, ASAKI and other industry organizations to form a secretariat to promote the project by encouraging the formation of joint ventures among related domstic and foreign private enterprises. It is desirable that the private enterprises include raw material producers and major manufacturers

representing east, central and west Java, including foreign capital-affiliated firms.

It is also desirable that the Ministry of Mining and Energy, the Ministry of Industry and the relevant provincial governments, IRDCRI, MTDC and other government agencies form a system to provide maximum support for the provision of infrastructure such as transportation, communication, power supply and fuel networks, improvement in the environment for investment and raw material imports and technological guidance for the parks.

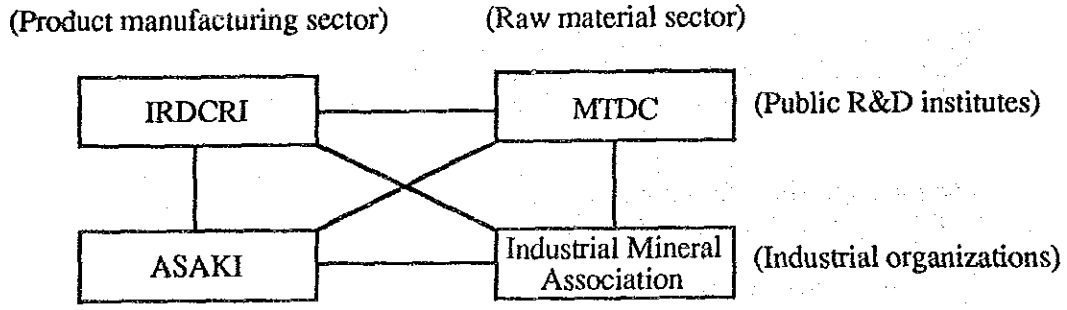
Requests for foreign aid in the areas of technology and know-how in advanced research, design, construction and management of the project should also be considered.

- Establishment of Support System -

Regarding the "establishment of a support system", it is recommended that a system be established for assisting the independent development of companies in all sectors of the industry from the upstream to downstream sectors through greater technological and industrial promotion activities by a joint public-private functional body.

The two research and development institutes of the IRDCRI and the MTDC and the two industrial organizations of ASAKI and the Industrial Mineral Association are envisioned as the organizations playing a central role in the support system. The program aims at augmenting and revitalizing the functions and activities of these four organizations and strengthening their mutual ties so as to move in the direction of more multilateral and effective use of their respective functions.

Fig. 2-6-4: Core Organizations of Support System (A Supposition)



Specifically, two programs are recommended: [1] the "augmentation of public testing and research and development institutes and strengthening of ties among institutes and ties with industrial world" aimed mainly at the augmentation of functions in the area of promotion of technology and development of human resources and [2] "revitalization of activities of industrial organizations" aimed mainly at vitalization of the practical technological and industrial promotion activities of actual industry itself. Recommendation is made of the directions of strengthening the system and the activities of main objectives.

(3) Program 3: Augmentation of public testing and research and development institutes and strengthening of ties among institutes and tie with industrial world.

1) Augmentation of Public Testing and Research and Development Institutes

The organizations covered by this program are the IRDCRI in the product manufacturing sector and the MTDC in the raw material sector. The MTDC is believed to

be sufficiently equipped in terms of functions, so here the recommendations will focus on the IRDCRI. The IRDCRI is the only specialized public testing and research and development institute in the ceramic manufacturing sector of Indonesia but has insufficient facilities and manpower. The augmentation of its functions is one of the basic tasks which must be tackled for the development of the ceramic manufacturing industry.

In terms of the approach for augmenting the IRDCRI, it is recommended to increase its fixed and operating funds so as to augment its facilities, manpower, and materials and also to stimulate use by companies through its strengthened functions. Improvements are considered necessary in all areas, such as replacement of antiquated facilities, installation of the requisite facilities, increase of researchers and expansion of the training system to improve their capabilities, and, through these, augmentation of the technical services offered. In particular, improvement of the system of technical services would be desirable.

In actuality, the IRDCRI mentions as requests to the central government and foreign assistance [1] an increase of the budget (current budget), [2] expansion of the facilities and buildings, [3] increase of number of researchers and augmented training, and [4] the provision of knowhow regarding analysis and testing of raw materials, research and development, the training curriculum, etc. In particular, it hopes for the augmentation of its research staff as well as its facilities.

It will be necessary to fundamentally improve the remuneration and research environment to secure and keep superior manpower. In addition, the augmentation of the external study activities of researchers is hoped for. Joint studies with official research organizations of foreign countries, acceptance of foreign experts and visits to foreign manufacturers for inspection and collection of information are considered as useful activities. Regarding joint studies, continuous activities for a total of one or two years involving the same person (also effective is a repetition of short-term activities) are hoped for. The main subjects of the studies will be tableware, novelties and tiles, areas in which there are few major manufacturers. Japan, the Asian NIEs and leading producing countries in Europe are cited as suitable places for studies. It is recommended that the Ministry of Industry play a central role in increasing budget appropriations for such purposes and strengthening tie-ups with relevant organizations and firms in foreign countries.

On the other hand, private companies mention as their requests to the IRDCRI [1] the faster provision of inspection and test results, [2] the provision of advice and comments based on the results of examinations, [3] the implementation of roving guidance and the dispatch of personnel to collect test samples, and [4] the reduction of the fees for training services for personnel.

Further, it will be necessary to strengthen the system of services for companies located in the outer localities. As the institute for playing the central role here, mention may be made of the Institute for Testing and Development of Industry (BPPI), an existing research institute in Surabaya in East Java. It is recommended that the facilities and manpower of the ceramic testing and analysis division of the institute be augmented and that ties with the IRDCRI be strengthened.

It is desirable that use be made of the principle of the beneficiaries paying for services, introduced starting in 1990, for services by the public institutes to private companies and that the revenue from this be used for augmentation of the material and equipment of the organizations and the training of their staffs.

The testing and research facilities and the training facilities which are considered to be necessary to be installed at IRDCRI for the time being are given in Table 2-6-4. The

table was prepared with an emphasis on the equipment for testing and analysis services to private companies and the same employee training services.

Detailed study, however, is believed necessary when actually considering providing these facilities.

Table 2-6-4: Testing/Research and Training Facilities Which are Considered to be Necessary to be Installed at IRDCRI

[1] Testing and Research Facilities

1	High Temperature Gas Furnace, $0.2m^3$	2 sets
2	Electric Kiln Max. 1600°c and Max. 1200°c	2 sets each
3	Viscosity Meter	2 sets
4	Compressive Strength Testing Machine, Max. 100t	1 set
5	Electronic Precision Balance, 100g, 200g, 500g	3 sets each
6	Infrared Moisture Determination Balance	1 set
7	Digital Ion Meter	2 sets
8	Hot Magnetic Stirrer	2 sets
9	Mixing Stirrer	2 sets
10	Air Oven 40°c~250°c, 90 liter and 150 liter capacity	1 set each
11	Fine Morter Grinder, Pressurizing type, use grinding alumina	1 set
12	Morter Grinder, 200 to 250, used for grinding alumina	4 sets
13	Finishing Jigger	2 sets
14	Vacuum Slip Tank	1 set
15	High Speed Ship Agitator	1 set
16	Firing Kiln 0.5 M^3 1200°c Shuttle Kiln 1 M^3 1400°c Shuttle Kiln 0.3 M^3 1700°c Shuttle Kiln	 2 sets 2 sets 1 set
17	Electric Kiln 1 M^3 1000°c	1 set
18	Vacuum Agitator for Gypsum plaster	1 set
19	Original Mould Jigger	1 set

20	Finishing Jigger (for gypsum plaster molds)	1 set
21	Wet Pan Mill	1 set
22	Friction Press and Hydraulic Press with Metal Mould	1 set each
23	Grinding Mill	1 set
24	Screen	1 lot
25	Mechanical jigger	4 sets
26	Spare parts (two to three years' worth)	1 lot
27	Others, various samples (products, raw materials, etc.), video sets, etc.	
[2]	Training Facilities	
1	Roll Crusher with ceramic roll	1 set
2	Jaw Crusher	1 set
3	Ball Mill with alumina liner and alumina ball 500kg 300kg 100 kg 50 kg	 2 sets 2 sets 3 sets 3 sets
4	Vibration Screen	2 sets
5	Magnetic Ferrofileter	4 sets
6	Agitator Portable Agitator	2 sets 2 sets
7	Ship Pump	1 set
8	Filter Press with diaphragm pump	2 sets
9	Vacuum Extruder	1 set
10	Automatic Cutter	2 sets
11	Automatic Jiggering Roller Machine	2 sets
12	Mangle Type Dryer with Hot Air Generator	1 set
13	Sieve Shaker with screen	2 sets
14	Vacuum Pump and Desiccator	1 set

15	Stamp mill with alumina mortar	2 sets
16	Refractoriness Tester	2 sets
17	Others (chemical analysis instruments, reagents, parts for existing facilities)	1 lot

2) Strengthening of Ties Among Organizations and Ties with Industrial World

[1] Strengthening of Ties Among Organizations

It is recommended that the ties among the two institutes of the IRDCRI and the MTDC be strengthened much more from the viewpoint of the necessity of the organic linkage and promotion of the industry from the upstream to downstream sector.

The necessity for strengthening ties is sufficiently understood, and the IRDCRI, the MTDC, and the Directorate of Mineral Resource (DMR) of the Ministry of Mining and Energy launched a working group for joint research at the end of 1990. This is a development worth considerable attention. The Ministry of Industry and the Ministry of Mining and Energy should, it is recommended, devise sufficient budgetary measures so as to give full support to this.

These research activities should be of a practical orientation. In this sense, participation of the private sector would be desirable. Participation of ASAKI and the Industrial Mineral Association in the above working group, as the founders also scheduled, should be sought in the hope that the results of the research activities will lead to the realization of concrete projects.

Further, it is hoped that ties will be strengthened much further in daily work as well. In particular, it is recommended that joint action be taken in conducting surveys of resources and guidance to raw material producers and that joint use be made of testing and analysis equipments.

[2] Strengthening of Ties with Industrial World

It is recommended that ties with the industrial world as well as ties among organizations be strengthened.

Even if the functions of the various institutes are augmented and ties between them strengthened to revitalize research activities, the results would be meaningless if not sufficiently used by the industrial world. Also, insufficient utilization would result in the atrophy of the institutes in the future.

The industrial world also should make positive use of the public research and development institutes to tackle the improvement of quality. At the same time, they should positively cooperate in the research of the public institutes through the provision of relevant data and materials. It is recommended that the members of the ASAKI and the Industrial Mineral Association arrange to periodically provide raw materials etc.

The basic requirement for the strengthening of the relations of the public institutes with the industrial world is the provision of attractive services. The emphasis in the services will be on the fields discussed in the next section.

3) Emphasis in Targets of Activities of Institute for Research and Development of Ceramic Industry (IRDCRI)

The functions of the IRDCRI stretch out over a wide range of activities in the

ceramic industry including basic research, applied research, research for the development of new fields, industrial guidance, the collection of technical materials and the provision of information, and development of human resources. Its functions, however, are weak overall. In particular, the services it provides, which have a direct effect on the improvement of the level of technology and quality of products of private companies, are insufficient. It is recommended that the IRDCRI strengthen its functions much more not only as a research and development institute but also as a service institute.

The special goals of the service activities to be strengthened include a) the strengthening and speeding up of testing and analytical services, b) the augmentation of the system for supply of manpower, and c) the augmentation of technological guidance and technical training and the dissemination of advanced technology information. The strengthening of these activities would necessitate the following:

a) Strengthening and Speeding Up of Testing and Analytical Services

It is necessary to drastically reduce the current one to two months required for testing and analysis, to broaden the scope of testing and analysis, and to improve the accuracy of the same. Toward this end, it will be necessary to improve facilities and equipment and provide more and better personnel.

The organization has substantially all of the equipment and facilities required for basic testing and analysis and for research, but these are antiquated as a whole and there are problems with precision. It is necessary to replace and augment the equipment and facilities, secure enough of a budget for procuring the research reagents and parts and improve inventory control. Also, it is essential to increase the number of researchers involved. To raise the precision of analysis, it will be important to directly collect samples by dispatching personnel to the sites as much as possible.

b) Augmentation of System for Supply of Manpower

It is recommended that the system for supply of engineers and candidates for middle management in factory be augmented.

The establishment of new specialized vocational schools and courses in universities would be desirable, but that would require considerable time and fund. Therefore, for the time being it is recommended that a specialized course be set up in the IRDCRI to teach the general and specific theories of ceramics as a whole, testing and applied technology for raw materials and products, including various experiments and actual practice, so as to develop human resources with a basic knowledge and understanding of ceramics. The persons trained preferably will be those with high school educations or their equivalent.

It will take several years to train specialized engineers and it would require a strong teaching staff and considerable funds. The IRDCRI etc. probably could not handle this. Also, the establishment of new specialized courses in universities would probably not be that easy.

Even so, many companies want to hire more engineers. The creation of a suitable system for supply of engineers is a long-term task which cannot be ignored. One approach could be to consider joint projects with neighboring countries. The ceramic industries of Thailand and Malaysia also have similar needs and there is believed to be a good chance for some form of international cooperation. The establishment of an "ASEAN Ceramic University" by the ASEAN Ceramic Industry CLUB (CICA) would be one idea. At that time, it might be possible for CICA to seek technological cooperation from the advanced countries. It is hoped that ASAKI will take the initiative in this regard.

c) Augmentation of Technological Guidance and Training of Skilled Workers and

Dissemination of Advanced Technical Information

[1] Technological Guidance

It is recommended that technological guidance be provided based on roving guidance at the sites of the various factories. The ways to improve the quality of ceramic products would differ depending on the raw materials and processes used and without diagnosing the actual situations it would be impossible to provide suitable advice.

The strengthening of roving guidance would necessitate a greater number of instructor and improved capabilities of the same.

It would also be very effective if foreign experts could be hired to provide joint guidance. This would also lead to improvement of the capabilities of the local instructors. Guidance by foreign experts may take the form of short-term (several weeks) itinerant guidance or long-term (about two years) individual guidance. More desirable will be long-term guidance. To realize this, either individual firms would receive the guidance at their own expense or government agencies and/or industry organizations would retain the foreign experts for itinerant guidance for nominated firms. At any rate, a considerable fund will be required to receive foreign experts. Thus, it is recommended that government agencies and industry organizations quickly look for means by which to obtain the required funds. It would also be necessary to ask for assistance from foreign aid organizations. Short-term guidance will also be effective. It is desirable to be continued for two or three years. Guidance would be directed to the tableware and tile industries which have many potentially export-oriented firms. Foreign experts would be invited from Japan and the Asian NIEs according to the majority opinion in the industry. As for tiles, an invitation of experts from Italy and Germany would also be effective because there are many leading plant manufacturers in the two nations.

In providing the guidance, it is vital that emphasis be placed on thorough permeation of TQC techniques in every area from the control of raw materials to the finishing of the final products.

[2] Training of Skilled Workers

It is recommended that training of skilled workers be performed mainly for the foreman class in private companies. All companies eagerly desire an improved system of training of this class of worker. The employees of private companies, however, cannot undergo long-term continuous training. Therefore, it is considered more practical to train step by step through repeated short-term training courses.

In the training of skilled workers too, it is considered vital that an emphasis be placed on understanding of TQC.

The training facilities of the IRDCRI require augmentation. In particular, the facilities of the practice factory are extremely insufficient and antiquated and are not in a state for actual use at the present time. It will be necessary to make a complete overhaul of the facilities, including the buildings.

[3] Dissemination of Advanced Technical Information

It is recommended that a reference library be established enabling free access to specialized journals, catalogs, scientific journals, excellent samples and other material and data of the advanced countries.

Further, it would be effective if the instructors would bring with them and distribute materials during their guidance tours or if an information journal would be published periodically and distributed to companies.

An example of the training schedule for the above supply of manpower and training of skilled workers is shown in Table 2-6-5.

Table 2-6-5: Example of Training Schedule

[Basic Course]

Object	Acquisition of basic knowledge, primarily in production and quality
Trainee	All ceramic related personnel
Subjects	Raw materials, manufacture, quality control (course of study)
Term	One month
Capacity	Up to 10 persons

[Expert Engineer Training Course]

Object	Improvement of expert knowledge and technical level regarding manufacture and quality
Trainee	Engineers and foreman class involved in ceramic production
Subjects	The training will be divided into academic study and actual practice and will cover the general theory of the ceramic industry, methods of refining and mixing raw materials, the general theory of the facilities, testing methods and equipment, manufacturing processes, design, gypsum plaster molds, process control, quality control, etc.
Term	Two months
Capacity	Up to 10 persons

[Skilled Worker Training Course]

Object	Improvement of skill in specialized sector
Trainee	Workers of ceramic factories
Subjects	The training will be provided for each sector as follows. • Sorting and refining of raw materials • Prepared body and preparation of glaze • Molding • Firing • Glazing and decoration • Preparation of gypsum plaster molds • Production of saggars and other kiln furniture
Term	One to two months for each sector
Capacity	Up to 10 persons

Regarding the subjects of training for each course, it would be desirable to refer to the model case in Japan shown in section 2-5-6.

(4) Program 4: Revitalization of activities of industrial organizations

In a developing industry, the coordination of businesses and activities for promoting the industry as a whole can have a great effect in strengthening the industry. It goes without saying that industrial organizations serve as public places for exchanges among businesses. From this viewpoint, it is recommended that the activities of the industrial organizations be revitalized.

There are two such organizations in the Indonesian ceramic industry: ASAKI in the product manufacturing sector and the Industrial Mineral Association in the raw material producing sector. The raw material sector was not covered by this survey, so sufficient information was not obtained on it and indications on it are being avoided. Here, mention will be made of the basic directions and main targets of the activities of ASAKI.

1) Basic Directions

The improvement of the quality of products and the strengthening of marketing, preconditions for Indonesia to rise to the position of a powerful center of supply in the international market, must be tackled by the industry as a whole, as has been repeated explained. Regarding the introduction of foreign capital and foreign technology as well, one of the effective means for industrial promotion, it is desirable both that individual companies tackle the issue and that a promotional system be created by the industry as a whole.

The central player in these activities will of course be ASAKI as it is the only industry-wide organization. ASAKI participates in foreign activities as a member of the ASEAN Ceramic Industry Club (CICA) and engages in its own domestic activities while maintaining ties with the Ministry of Industry and the IRDCRI. The activities themselves, however, cannot be said to be very energetic and the member companies do not have a strong sense of participation in the organization.

It is necessary and essential that the activities of ASAKI be revitalized so as to proceed with industrial promotion activities on an industry level and change the industry to one of good coordination and a strong desire for improvement.

At the same time, ASAKI as members of the support system should strengthen much more ties with the Industrial Mineral Association and the IRDCRI and MTDC. It is recommended that ASAKI and Industrial Mineral Association establish a place for periodic exchanges each others so as to exchange information and discuss mutual needs. In particular, it is hoped that opinions will be quickly exchanged on the idea of the "construction of a raw material and auxiliary material estate". The necessity for strengthening ties with public research and development institute is as discussed previously.

The key goals of the promotional activities of ASAKI for the time being may be considered to be [1] strengthening of overseas marketing, [2] introduction of foreign capital and foreign technology, [3] promotion of industrial development campaigns, and [4] completion of industrial standards and introduction of export inspection system.

2) Strengthening of Overseas Marketing

The marketing sectors of the ceramic product manufacturing companies are weak overall and are limited in the range of their activities. It is considered of first priority to stimulate marketing on the industry level. In this regard, it is recommended that the

activities of ASAKI be revitalized.

In promoting marketing activities, it would be effective to seek cooperation from the National Agency for Export Development (NAFED), the Ministry of Trade, the Ministry of Industry, and other related government organizations and to seek assistance from foreign public organizations through the same. Further, it would be desirable to further stimulate exchanges with corresponding foreign industrial organizations to enlarge the pipeline of communication.

The basic issue which should be recognized in proceeding with overseas marketing are as follows:

[1] Ceramic products differ tremendously in specifications, standards, needs, tastes, and fashion depending on the market concerned. Without the opportunity for direct access to the markets, it wold be impossible to determine the real nature of those markets and therefore impossible to find the direction in which products should be improved to make them suited for the target markets. First of all it is therefore necessary to increase the opportunities for directly studying foreign markets.

[2] It is necessary to prepare in advance PR materials such as corporate brochures, catalogs, and price lists. The preparation of such basic materials is a basic assumption in marketing and without such materials one could not even get one's foot into the door of international business.

[3] The majority of the ceramic products of Indonesia would probably require improvement to make them suited for other markets. The most efficacious means for this would probably be to obtain guidance from outside experts. The experts preferably would be foreign merchandising experts well versed in the actual situation of the international market. The Ministry of Industry, IRDCRI and ASAKI will have to quickly consider the invitation of experts for itinerant guidance of firms. It would be practical to ask for the cooperation of foreign aid organizations in the invitation of experts. For the time being, the main enterprises to receive the guidance will be types B and C firms in the tableware and tile industries. It is believed that, to be effective, short-term guidance should be repeated for a period of about two years. Also, it would be effective to conduct monitoring studies of products through official legations overseas, foreign public organizations, and survey companies.

The key products to be marketed on an industrial level and the markets to be covered may be as follows:

The key products for the time being could be tableware and tiles, for which companies have been slow to market and for which many companies request public assistance in.

The key markets could be, judging from the degree of interest of the industry, the U.S., followed by the EC, Japan, and ASEAN for tableware and the U.S. and ASEAN and also Japan, the EC, and the Asian NIE's for tile. For the time being it would be practical to consider starting with about the two markets most interested in by the industry.

The following activities could be considered as marketing activities for the industrial organizations:

[1] Collection of Overseas Market Information and Provision of Same to Members

The organizations should start by acquiring lists of buyers in the markets the industry is most interested in and gradually expand their activities to dispatch survey

missions etc. In dispatching missions, opportunities should be arranged for visits to the corresponding industrial organizations of the other countries to create a channel for future exchanges.

[2] Provision of Industry Information to Overseas Buyers

The first step should be the preparation of an English language members list of ASAKI. The minimum information provided should be profiles of the members and introductions of their products, with photographs. At that time, it would be effective to seek guidance from NAFED etc.

[3] Participation in Overseas Trade Fairs, Exhibitions, and Business Meetings

It is desirable that the organizations be aggressive in displaying products at the overseas trade fairs and exhibitions and joining in business meetings participated in or sponsored by NAFED.

[4] Sponsoring of Trade Practice Seminars and Study Groups

The organizations should commence with sponsoring study meetings with export-wise traders as instructors. Further, if it is possible to hire commodity experts as in the next item, it is recommended that seminars be held using the opportunities thus presented.

[5] Acquisition of Guidance for Improving Products From Foreign Merchandising Experts Well Versed in International Market

3) Promotion of Introduction of Foreign Capital and Foreign Technology

In this regard too, it is recommended that the role of ASAKI be enhanced so that it may serve as a channel or administrative office for efforts on the improvement of the relevant environment, foreign contacts, and PR.

Joint venture investments and technological tie-ups with foreign companies would be extremely effective in promoting development of the export industry. This is attested in the ceramic product manufacturing industry of Indonesia (see section 2-5-6). Individual guidance by foreign technical experts would also be a practical approach to this. In actuality, many Indonesian factories are successfully improving their quality of products by this approach.

The necessity of introduction of foreign capital and foreign technology is well understood by the ceramic product manufacturers as well and many, particularly among the tableware manufacturers, desire some joint venture investment or technological tie-up. Under current conditions, however, most companies do not even know where to begin in making contact with foreign companies or experts and therefore there are strong calls to the public organizations to assist in introducing companies etc.

It is hoped that ASAKI will guide the industry and seek cooperation from the Investment Coordination Board (BKPM) and foreign public organizations and that it will deepen its exchanges with corresponding industrial organizations of other countries and create the environment for introduction of foreign capital and foreign technology.

The key areas for introduction of foreign capital and foreign technology should be tableware and tile, which the industry is strongly interested in, and novelties, which there are still few examples of tie-ups. In tile industry, stress should be placed on technological tieups in view of the degree of interest shown by companies.

The main partners should be companies of Japan and the Asian NIE's in view of the interest expressed by the industry in them.

To meet the needs of the industry, the foreign experts for tableware and novelties

should be hired from Japan and the Asian NIE's and for tile from Italy and Japan.

The following activities may be considered as means for improving the relevant environment on the industry level:

[1] Collection of information regarding foreign companies promising as candidates for capital and technological tie-ups and provision of same to members
[2] Provision of industry information to foreign companies with interest in joint venture investment and technological tie-up with Indonesian companies
[3] Sponsoring of practical seminars and training on joint ventures and technological tie-ups
[4] Dispatch of investment missions overseas
[5] Work as channel for technical guidance from plant manufacturers etc. and reception of foreign experts

4) Promotion of Industrial Development Campaign

It is recomended that a campaign be run by ASAKI in cooperation with the IRDCRI to increase interest in technical development and recognition of importance of quality of product. Possible approaches to this could include the greater augmentation of the Indonesian Ceramic Fair, the sponsoring of a design contest, and also the granting of marks of excellence to superior products.

5) Completion of Industrial Standards and Introduction of Export Inspection System

[1] Establishment of Industrial Standards

The Ministry of Industry is hurrying to establish a system of uniform standards aimed at the improvement and augmentation of the country's industrial standards (SII). It is recommended that ASAKI and the IRDCRI also positively participate in this endeavor. Most of the ceramic companies of Indonesia presently have no interest at all in SII or also use the standards of the European nations, United States or Japan - one or the other. There is little awareness of the existence of the SII. It is considered necessary to make the SII more advanced as standards and also to promote their use to raise the quality of ceramic products from the bottom up.

[2] Introduction of Export Inspection System

It is further recommended that consideration be given to the introduction of a system for preventing in advance the shipment of defective export products. By way of note, Japan has a unique system of legally-based compulsory export inspection. This was set up to secure confidence of overseas buyers in Japanese made products. This system functioned effectively in the start and expansion of exports by the Japanese ceramic industry. The inspecting organization is the Japan Pottery Inspection Association which examines the appearance of export products, their dimensions, content of lead, cadmium, and other toxic substances, durability, etc. Products which pass the inspections are labeled with a certificate of passage. Further, a certificate of export inspection is issued. This has proven effective in guaranteeing quality to overseas buyers. The introduction of such a system in Indonesia as well deserves consideration. It is hoped that this will be discussed among the Ministry of Industry, the Ministry of Trade, the IRDCRI, and ASAKI.

This type of system would be easier to accept in Indonesia if it were not compulsory, but voluntary. It is vital, however, to understand that whether or not either the industrial standards or export inspection system prove effective will depend on the awareness of individual companies of the necessity for better quality.

(5) Program 5: Establishment of policy coordination function

From the viewpoint of promoting the industry with organic linkage of every area

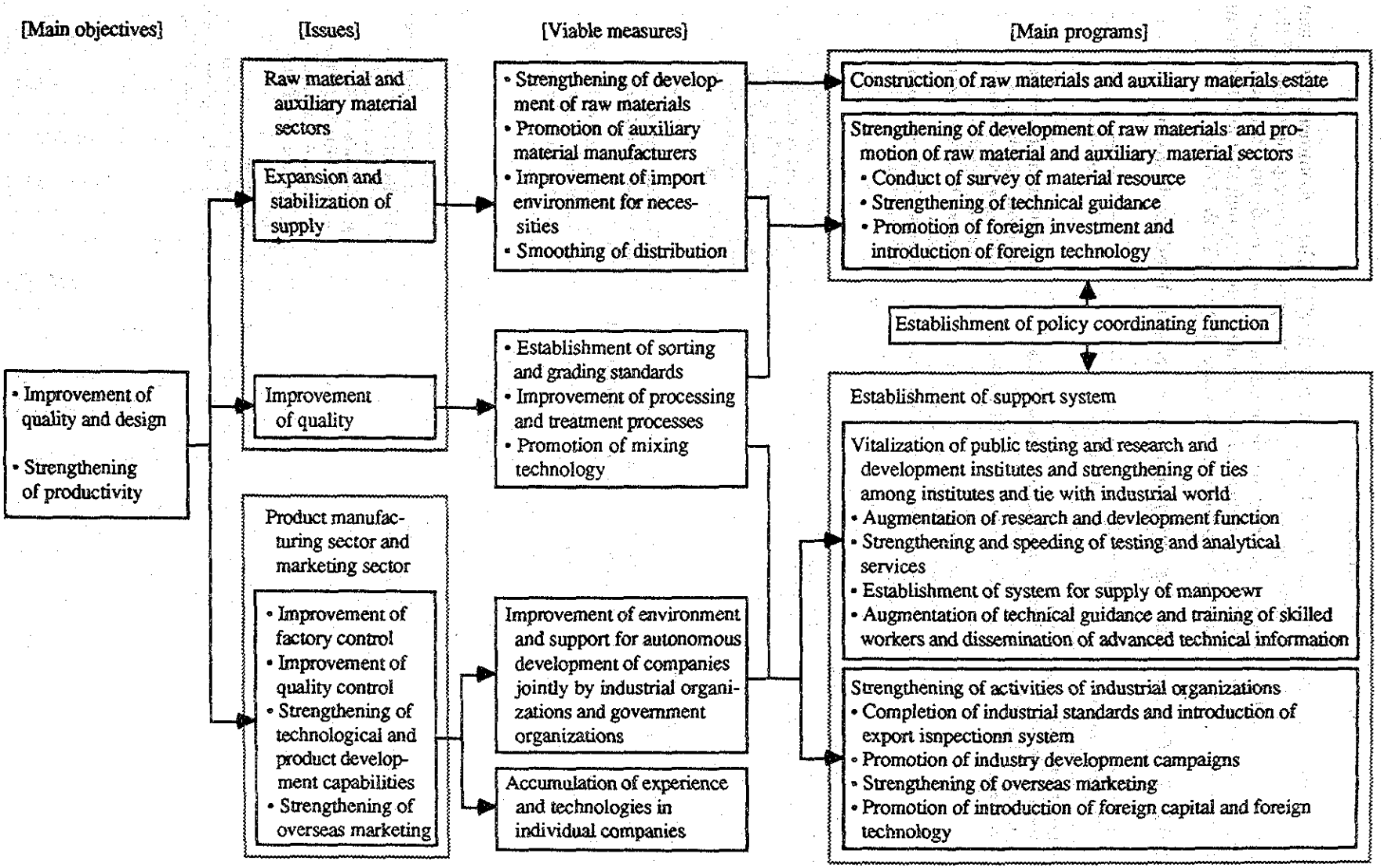
from the upstream to downstream sector, it would be recomended to create a function for coordinating policies and promotional activities relating to the ceramic industry. It is recommended that a consultative body comprised of the related ministries and agencies, public organizations, and industrial organizations be launched and hold a "Indonesian Ceramic Conference" about once every half year so as to exchange information on the current state of the industry, problems, and plans.

It is hoped that a task force will be established in that consultative body so as to quickly start a feasibility study on the plan of "construction of a raw material and auxiliary material estate" recommended as program 2.

The members of the consultative body preferably would be representatives of the following ministries, agencies, and organizations:

- Ministries and agencies:
  Departments and directorates in charge in Ministry of Industry, Ministry of Mining and Energy, Ministry of Trade, National Agency for Export Development, Investment Coordination Board, and Ministry of Finance
- Departments and directorates in charge in local autonomous bodies of main production areas
- Technical promotion and testing and R&D organizations:
  Mineral Technology Development Centre and Institute for Research and Development of Ceramic Industry
- Industrial organizations etc.:
  Indonesian Ceramic Association, Industrial Mineral Association, State Mining Company

Fig. 2-6-5: Measures for Promotion of Ceramic Industry



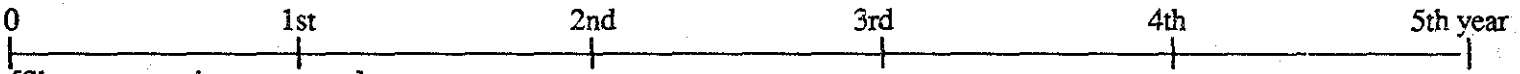
2-6-4 Schedules of Programs

Based on the above-mentioned "basic perspective", "policy recommendation, and "recommendation on specific programs", the specific proposals for promotion of the Indonesian ceramic product industry are divided into short-, medium-, and long-term programs. The programs for promotion of the ceramic product industry are shown in Table 2-6-6 and the schedules for implementation are shown in Table 2-6-7.

Table 2-6-6: Programs for Promotion of Ceramic Product Industry

Proposed programs	Contents	Methods
Short-term action programs		
I. Strengthening of activities of industrial organizations	• Promotion of introduction of foreign capital and foreign technology • Technological and managerial guidance to individual companies • Strengthening overseas marketing • Completion of industrial standards and introduction of export inspection system • Promotion of development campaigns, etc.	• Revitalization of activities of industrial organizations • Exchanges with foreign industrial organizations • Guidance by foreign technical experts • Guidance by foreign commodity experts etc.
Short-term programs		
II. Establishment of policy coordinating functions	• Formulation/operation of comprehensive industrial promotion policies	• Formation of joint forum of ministries and agencies, local autonomous bodies, public research and development institutes, and industrial organizations
Medium-term programs		
III. Augmentation of public testing and research and development institutes and strengthening of ties among organizations and ties with industrial world	• Augmentation of research and development functions • Strengthening of testing and analytical services • Establishment of system for supply of manpower • Augmentation of technological guidance, technical training, dissemination of advanced technical information, etc.	• Detailed future surveys • Improvement of IRDCRI functions and modernization of facilities • Augmentation of testing facilities of ceramic analysis division of BPPI in Surabaya
Long-term programs		
IV. Construction of raw material and auxiliary material estate	• Gathering of producers and suppliers, of raw materials, mixed materials, and auxiliary materials	• Detailed future surveys • Third sector system (government agencies, industrial organizations, private companies, foreign companies)
V. Strengthening of development of raw materials and promotion of raw materials and auxiliary materials sectors	• Full-scale survey of resources of raw materials • Strengthening of technological guidance to raw material manufacturers • Introduction of foreign capital and foreign technology to auxiliary material sector	• Ties between IRDCRI, MTDC and raw material manufacturers • Roving guidance by IRDCRI and MTDC • Establishment of domestic investment companies and promotion of foreign investment

Table 2-6-7: Schedules for Implementation of Promotion Programs for the Ceramic Products Industry



[Short-term action programs]
I. Revitalization of activities of industrial organization
[1] Promotion of introduction of foreign capital and foreign technology, strengthening of overseas marketing
Planning and implementation

[2] Promotion of industrial development campaign
Planning and implementation

[3] Completion of industrial standards and introduction of export inspection system
Research, consideration and planning

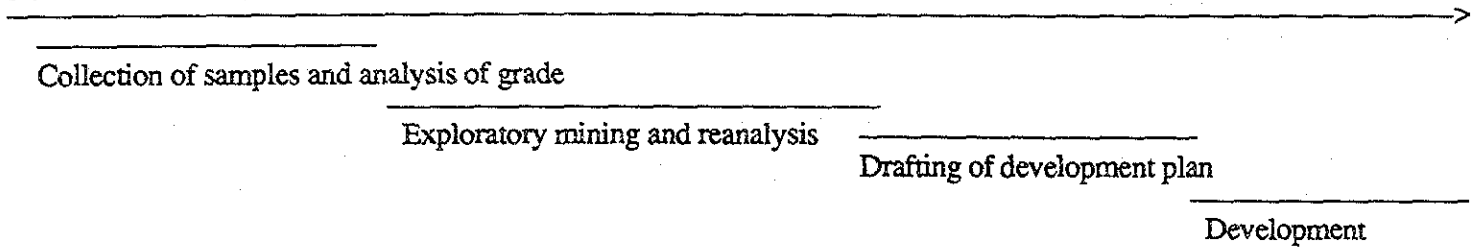
[Short-term programs]
II. Establishment of policy coordinating functions
Establishment of an advisory panel (Formulation/operation of comprehensive industrial promotion policies)

[Medium-term programs]
III. Augmentation of public testing and research and development institutes and strengthening of ties among institutes and tie with industrial world
(Augmentation of research and development functions, strengthening of testing and analytical services, establishment of system for supply of manpower, augmentation of technological guidance, technical training, dissemination of advanced technical information)
Survey
Design/tender/production
Delivery/installation

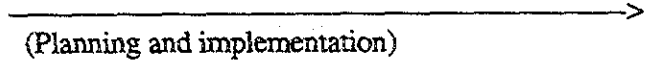
[Long-term programs]
IV. Construction of raw material and auxiliary material estate
(Gathering of producers and suppliers of raw materials, mixed materials, and sauxiliary materials)
Survey
Design/tender
Construction

V. Strengthening of development of raw materials and promotion of raw material and auxiliary material sectors

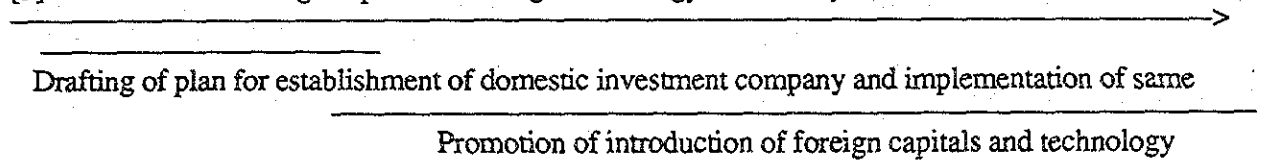
[1] Full-scale survey of resources of raw materials



[2] Strengthening of technical guidance to raw material manufacturers



[3] Introduction of foreign capital and foreign technology to auxiliary material sector



2-7 Information for Promotion of Joint Venture Investment and Technological Tie-ups

2-7-1 List of Japanese Firms Interested in Joint Venture Investments and Technological Tie-ups with Indonesian Firms

(1) Firms Interested in Joint Venture Investments and Tie-ups

1) Name of company: **IKEDA MARUYO CO., LTD.**
Address: 104, Minami-nakanokiri-cho, Seto-shi, Aichi 489
Paid-in capital: ¥2.1 billion
Annual sales: ¥350 million
Number of employees: 60
Main production items: Novelties (Semi-processed tableware, ornaments and toys)

2) Name of company: **MOROTO SEITO CO., LTD.**
Address: 11-14, Toei-cho, Yokkaichi-shi, Mie 510
Paid-in capital: ¥6 million
Annual sales: ¥130 million
Number of employees: 12
Main production items: Tableware and ornaments

3) Name of company: **SHOWA SEITO CO., LTD.**
Address: 2035, Dachi-cho, Toki-shi, Gifu 509-54
Paid-in capital: ¥10 million
Annual sales: ¥950 million
Number of employees: 120
Main production items: Dinner sets, mugs, stone ware dinner sets and new bone china

4) Name of company: **SENYO CORP.**
Address: 3-69, Ichinokura-cho, Tajimi-shi, Gifu 507
Paid-in capital: ¥50 million
Annual sales: ¥550 million
Number of employees: 30
Main production items: Japanese tableware

5) Name of company: **NISSIN CHINA CO., LTD.**
Address: 1740-1, Shimokiri, Kani-shi, Gifu 509-02
Paid-in capital: ¥19 million
Annual sales: ¥1.2 billion
Number of employees: 170
Main production items: Ceramic products and Japanese and Western tableware

6) Name of company: **HONJI TOGYO CO., LTD.**
Address: 248, Kosaka-cho, Seto-shi, Aichi 489
Paid-in capital: ¥20 million
Annual sales: ¥870 million
Number of employees: 110
Main production items: Novelties and novelty tableware

7) Name of company: **IWAO JIKI KOGYO CO., LTD.**
Address: 1288, Arita-cho, Nishi-matsuura-gun, Saga 844
Paid-in capital: ¥200 million
Annual sales: ¥9.71 billion
Number of employees: 690
Main production items: Ceramics for chemical industry, tiles, relief, ceramic products, ceramic works of art and design and execution of water treatment

8) Name of company: **JAPAN CERAMIC ENGINEERING CO., LTD.**
Address: 3-16, Kanda-nishiki-cho, Chiyoda-ku, Tokyo 101
Paid-in capital: ¥10 million
Annual sales: ¥250 million
Number of employees: 15
Main production items: Ceramic plants (fire-resistant bricks, ceramic products, etc.)

9) Name of company: **TAKASAGO INDUSTRY CO., LTD.**
Address: 2321-2, Dachi-cho, Toki-shi, Gifu 509-54
Paid-in capital: ¥200 million
Annual sales: ¥13.0 billion
Number of employees: 700
Main production items: Various ceramic plants, various ceramic kilns, ceramic machinery and equipment, manufacture and sale of ceramic products (tiles, tableware, roofing-tiles, etc.) and engineering

(2) Firms Interested in Technological Tie-ups

1) Name of company: **SANGO CO., LTD.**
Address: 27, Nakaida, Sangoh-cho, Owariasahi-shi, Aichi
Paid-in capital: ¥140 million
Annual sales: ¥6.5 billion
Number of employees: 380
Main production items: Ceramic dinner sets, tableware for gifts, collector plates, tableware for industrial use at hotels and restaurants, transfer paper for ceramic and glass tableware

2) Name of company: **KAMIO TOHKI CO., LTD.**
Address: 381-1, Shimoebi-cho, Yokkaichi-shi, Mie
Paid-in capital: ¥10 million
Annual sales: ¥ 100 million
Number of employees: 20
Main production items: Tableware

3) Name of company: **MARURI SHOTEN CO., LTD.**
Address: 56, Nishitani-cho, Seto-shi, Aichi 489
Paid-in capital: ¥3.5 million
Annual sales: ¥150 million
Number of employees: 13
Main production items: Ceramic tableware and novelties

4) Name of company: **HOYA CHINA CORP.**
Address: 1-1, Matsusaka-cho, Tajimi-shi, Gifu 507
Paid-in capital: ¥5.76 billion
Annual sales: ¥3.02 billion
Number of employees: 105
Main production items: Manufacture of ceramic products and Western ceramic products

5) Name of company: **S. HIBINO CO., LTD.**
Address: 3-1, Tashiro-cho, Tajimi-shi, Gifu 507
Paid-in capital: ¥40 million
Annual sales: ¥300 million
Number of employees: 18
Main production items: Ceramic products, tableware and flower vases

6) Name of company: **KANEDAI SEITOSHO CO., LTD.**
Address: 2442, Dachi-cho, Toki-shi, Gifu 509-54
Paid-in capital: ¥16 million
Annual sales: ¥1.4 billion
Number of employees: 150
Main production items: Ceramic products

7) Name of company: **TAIYO POTTERY CO., LTD.**
Address: 3-31, Karijaku-cho, Owariasahi-shi, Aichi 489
Tel: 05615-3-2811
Paid-in capital: ¥3 million
Annual sales: ¥60 million
Number of employees: 6
Main production items: Ceramic products and washstand articles

8) Name of company: **DAINICHI SEITOSHO**
Address: 125, Ohtsubo-cho, Seto-shi, Aichi 489
Paid-in capital: ¥12 million
Annual sales: ¥770 million
Number of employees: 45
Main production items: Ceramic toys

9) Name of company: **SUGIURA SEITO KAISHA, LTD.**
Address: 955-29, Kasahara-cho, Toki-gun, Gifu
Paid-in capital: ¥36 million
Annual sales: ¥1.5 billion
Number of employees: 120
Main production items: Tiles

10) Name of company: **SHIGA TILE CO., LTD.**
Address: 1377-1, Nagano, Kohga-shigaraki-cho, Shiga 527-18
Paid-in capital: ¥30 million
Annual sales: ¥770 million
Number of employees: 57
Main production items: Manufacture of ceramic tiles (mainly for exterior decoration) and glaze and sale of raw materials for ceramic industry

11) Name of company: **YAMAHIRO TILE**
Address: 4022, Kasahara-cho, Toki-gun, Gifu 507
Paid-in capital: ¥35 million
Annual sales: ¥900 million
Number of employees: 50
Main production items: Large-sized exterior tiles, floor tiles and mosaic tiles

12) Name of company: **AOYAMA DENTO K.K.**
Address: 2-13, Kohhan-cho, Seto-shi, Aichi 489
Paid-in capital: ¥1.5 million
Annual sales: ¥600 million
Number of employees: 20
Main production items: Ceramic mirror stands, door knobs, switch plates, components for lighting equipment and furniture parts

13) Name of company: **SHINKO CERAMICS CO., LTD.**
Address: 4-1, Kyo-machi, Yokkaichi-shi, Mie 510
Paid-in capital: ¥20 million
Annual sales: ¥240 million
Number of employees: 20
Main production items: Molds for rubber and vinyl gloves

14) Name of company: **MARUKU KURIKI SEITOSHO K.K.**
Address: 962-1, Sae-cho Mizukami, Mizunami-shi, Gifu
Paid-in capital: ¥16 million
Annual sales: ¥300 million
Number of employees: 35
Main production items: Ceramic products for domestic and overseas use

2-7-2 List of Indonesian Firms Interested in Joint Venture Investments and Technological Tie-ups with Japanese Firms

(1) Firms Interested in Joint Venture Investments

1) Name of company: **P.T. INDO KERAMIK INTI. WIDYA**
Address of head office: Jl. Jend. Sudirman Kav. 21 Lt. 22 Chase Plaza Building, Jakarta
Tel: 5706388
Fax: 5706370
Address of factory: Jl. Telesonic KM 8 (Jl. Raya Serang), Tengerang, West Java
Tel: 99-22108
Fax: -
Name of chief executive: Husodo Angkosubroto
Name of responsible Person for contact: Yoyo Sucahyo
General Manager
Year of establishment: 1979
Paid-in capital: Rp. 400,000,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: n.a
Land & factory area:
Land: 50,000 m^2
Factory: n.a
Main production items: Table ware
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	1.5	1.8	2.1	2.8	4.1
Number of employees	580	600	600	600	580

(2) Firms Interested in Joint Venture Investments and Technological-Tie-ups

1) Name of company: **P.T. SANGO CERAMICS INDONESIA**
Address of head office: Jl. H.A. Salim No. 2-4, Semarang, Central Java
Tel: 288391/3
Fax: 289335-316856
Address of factory: Desa Randugerut Km. 14, Kecamatan Tugu, Semarang Barat, Central Java
Tel: 27443
Fax: -
Name of chief executive: R. Soehardi
Name of responsible: R. Soehardi
Person for contact: Top Director
Year of establishment: 1977
Paid-in capital: Rp. 2,000.000.000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area: Land: ±60,000 m^2
Factory: 22,473 m^2
Main production items: Table ware
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	1,853	2,205	2,746	5,111	11,772
Number of employees	579	720	699	1,080	1,347

2) Name of company: **JATI AGUNG CERAMIC**
Address of head office: Kapal, Mengwi, Denpasar, Bali
Tel: -
Fax: -
Address of factory: Kapal, Mengwi, Denpasar, Bali
Tel: -
Fax: -
Name of chief executive: Anak Agung Ngurah Oka
Name of responsible: Anak Ngurah Wirasaba
Person for contact: Vice President
Year of establishment: 1970
Paid-in capital: n.a
Share holders: n.a
Indonesian:
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area: Land: 1,200 m^2
Factory: n.a
Main production items: Hotel ware, arts articles
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	15	15	17	19	25
Number of employees	12	12	12	12	12

3) Name of company: **C.V. JENGGALA**
Address of head office: Jl. Batujimbar, Sanur P.O. Box 25 Denpasar, Bali
Tel: 88147
Fax: (62)361-71930
Address of factory: Jl. Batujimbar, Sanur P.O. Box 25 Denpasar, Bali
Tel: 88147
Fax: (62)361-71930
Name of chief executive: Ada Daria Ariani Wowo Runtu
Name of responsible Ada Daria Ariani Wowo Runtu
Person for contact: Chief executive
Year of establishment: 1987
Paid-in capital: Rp. 84,000,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area:
Land: n.a
Factory: n.a
Main production items: Novelty
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	–	–	118,696	288.32	359,697
Number of employees	–	–	23	40	47

4) Name of company: **KALIMANTAN INDAH**
Address of head office: Jl. Tanjung Pura No. 45 A Pontianak, West Kalimantan
Tel: 35916
Fax: -
Address of factory: Jl. Khatulistiwa Km. 6.6, Desa Batu Layang-Pontianak Utara, West Kalimantan
Tel: -
Fax: -
Name of chief executive: Andy Salim
Name of responsible Andy Salim
Person for contact: Director
Year of establishment: 1986
Paid-in capital: Rp. 25,000,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: n.a
Land & factory area:
Land: n.a
Factory: n.a
Main production items: Water jar/vas/souvenir goods
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)					60
Number of employees					25

5) Name of company: **P.T. INA SEITO INDONESIA**
Address of head office: Jl. H.A. Salim No. 2-4 Semarang, Central Java
Tel: 288391/3
Fax: 289335
Address of factory: Randugarut Km. 14
Tel: 27443
Fax: -
Name of chief executive: R. Soehardi
Name of responsible R. Soehardi
Person for contact: Top Director
Year of establishment: 1982
Paid-in capital: Rp. 100,000,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area:
Land: 32,871 m^2
Factory: 12,531 m^2
Main production items: Sanitary goods
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	551	628	1,486	4,477	7,960
Number of employees	256	191	175	506	609

6) Name of company: **P.T. POLA KERAMINDO KHATULISTIWA**
Address of head office: Jl. Tanjung Pura No. 45 A Pontianak, West Kalimantan
Tel: 35916
Fax: -
Address of factory: Jl. Khatulistiwa Km. 6.6, Desa Batulayng-Pontianak Utara, West Kalimantan
Tel: -
Fax: -
Name of chief executive: Yusman Logam
Name of responsible Yusman Logam
Person for contact: Director
Year of establishment: 1990
Paid-in capital:
Share holders:
Indonesian: 100 %
Foreign:
Legal status: n.a
Land & factory area:
Land: 30,000 m^2
Factory: 4,000 m^2
Main production items: Mosaic tile
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)					
Number of employees					

7) Name of company: **P.T. ASIA VICTORY INDUSTRI LTD.**
Address of head office: Jl. Ambengan 10 Surabaya, East Java
Tel: 031-512358
Fax: 031-512362
Address of factory: Jl. Karang Pilang Barat 201 Surabaya, East Java
Tel: 031-832470
Fax: 031-831354
Name of chief executive: Sutantno Sudarga
Name of responsible Dra. Melany Puspawary
Person for contact: Accounting Manager
Year of establishment: 1972
Paid-in capital: Rp. 1,800,000,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area:
Land: 230,000 m^2
Factory:
Main production items: Wall and floor tile
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	2,247	3,262	4,631	5,762	9,796
Number of employees	455	502	589	606	933

8) Name of company: **PD. SARANA BANGUNAN UNIT PBSTA "LOKA"**
Address of head office: Jl. Basuki Achmad 15 Surabaya, East Java
Tel: 031-41366
Fax: 472858
Address of factory: Jl. Mastrip 24 Karang Pilang Surabaya
Tel: 031-8303307
Fax: -
Name of chief executive: Ir. Achmad Effendi
Name of responsible Ir. Achmad Effendi
Person for contact: Chief of Section
Year of establishment: 1919
Paid-in capital: Rp. 2,000,000,000
Share holders: n.a
Indonesian:
Foreign:
Legal status: n.a
Land & factory area:
Land: 18,000 m^2
Factory: 11,900 m^2
Main production items: Chamole brick high alumina brick
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	79.40	47.75	166.73	155.28	111.16
Number of employees	386	356	320	320	306

(3) Firms Interested in Technological Tie-ups

1) Name of company: **P.T. JASTISUMA INDAH KERAMIKA INDUSTRI CO.**
Address of head office: Desa Jemundo, Kec. Taman, Kabupaten Sidoarjo, East Java
Tel: 832587
Fax: 817527
Address of factory: Desa Jemundo, Kec. Taman, Kabupaten Sidoarjo, East Java
Tel: 817669
Fax: 817527
Name of chief executive: R. Hadi Djojowisastro
Name of responsible Person for contact: R. Hadi Djojorisastro, General Director
Year of establishment: 1977
Paid-in capital: Rp. 4,800,000,000
Share holders: Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area: Land: 68,354 m^2
Factory: 29,590 m^2
Main production items: Table ware
Annual sales turnover & number of employees

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	2,464	2,975	3,258	3,063	3,804
Number of employees	878	948	1,000	1,200	1,246

2) Name of company: **TANAH MURNI**
Address of head office: Jl. Mutumanikam 2, Jatinegara (13330) Jakarta Timur
Tel: 8195664
Fax: -
Address of factory: Jl. Tanab Merdeka No. 9, Jl. Raya Bogor Km 22, Cijantung, Jakarta Timur
Tel: -
Fax: -
Name of chief executive: R. Tjahya Delima
Name of responsible Person for contact: R. Tjahya Delima, Director/Owner
Year of establishment: 1978
Paid-in capital: Rp. ±20,000,000
Share holders: Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area: Land: 1,560 m^2
Factory: 470 m^2
Main production items: Hotel and restaurant crockery
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	15	25	30	40	60
Number of employees	27	26	25	25	25

3) Name of company: **P.T. SRI INTAN TOKI INDUSTRY**
Address of head office: Jl. Pangeran Jayakarta Blok B 17, Jakarta
Tel: 6290814
Fax: -
Address of factory: Jl. Raya Ciluar 323 Bogor
Tel: 312017
Fax: -
Name of chief executive: M. Nasir S. Harahap
Name of responsible Person for contact: M. Nasir S. Harahap
General Director
Year of establishment: 1983
Paid-in capital: Rp. 400,000,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area:
Land: 2,662 m^2
Factory: 987 m^2
Main production items: Coffee set, cup saucer, flower vase
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	600	950	550	1,200	3,000
Number of employees	100	145	178	197	250

4) Name of company: P.T. PEARLAND
Address of head office: Jl. Karet Tengsin No. 19, Jakarta, 10220 Indonesia
Tel: 1021/5703369
Fax: -
Address of factory: Desa Sentul Kec. Balaraja, Keb. Tangerang Jawa-Barat
Tel: 082-124016
Fax: -
Name of chief executive: Mr. Noriaki Kobayashi
Name of responsible Person for contact: Kumpul N. Otsudo
General Director
Year of establishment: 1987
Paid-in capital: US$ 1,500,000
Share holders:
Indonesian: 20 %
Foreign: 80 %
Legal status: PMA PMDN BRO Other
Land & factory area:
Land: 20,865 m^2
Factory: 13,584 m^2
Main production items: Ceramic dolls industry
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)				1,178	5,900
Number of employees			35	490	1,200

5) Name of company: **P.T. ARTISTIKA INKERMAS**
Address of head office: Jl. Tipar, Kampung Baru Cakung Jakarta 13910
Tel: 4600963, 4600964, 4600471
Fax: -
Address of factory: J1, Tipar, Kampung Baru Cakung Jakarta 13910
Tel: 4600963, 4600964, 4600471
Fax: -
Name of chief executive: Ph. Wiyadharma
Name of responsible Ph. Wiyadharma
Person for contact: President
Year of establishment: 1976
Paid-in capital: Rp. 400,000,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area:
Land: 30,000 m^2
Factory: 7,000 m^2
Main production items: Tile
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	1,730	1,362	1,476	1,464	1,827
Number of employees	3,897	3,945	3,455	3,556	3,407

6) Name of company: **P.T. ANGSA DAYA**
Address of head office: Jl. Gajah Mada No. 3-5, "DUTA MERLIN" Blok B. 12 Jakarta
Tel: 372132
Fax: (012)3803475
Address of factory: Jl. Pasar Kemis, Desa Kutajaya, Kec. Pasar Kemis Tangerang, West Java
Tel: -
Fax: -
Name of chief executive: Kerim Tjandra
Name of responsible
Person for contact:
Year of establishment: 1975
Paid-in capital: Rp. 7,649,040,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area:
Land: 206,002 m^2
Factory:
Main production items: Ceramic tile, mosaic tile, granite tile, earthen ware
Annual sales turnover & number of employees:

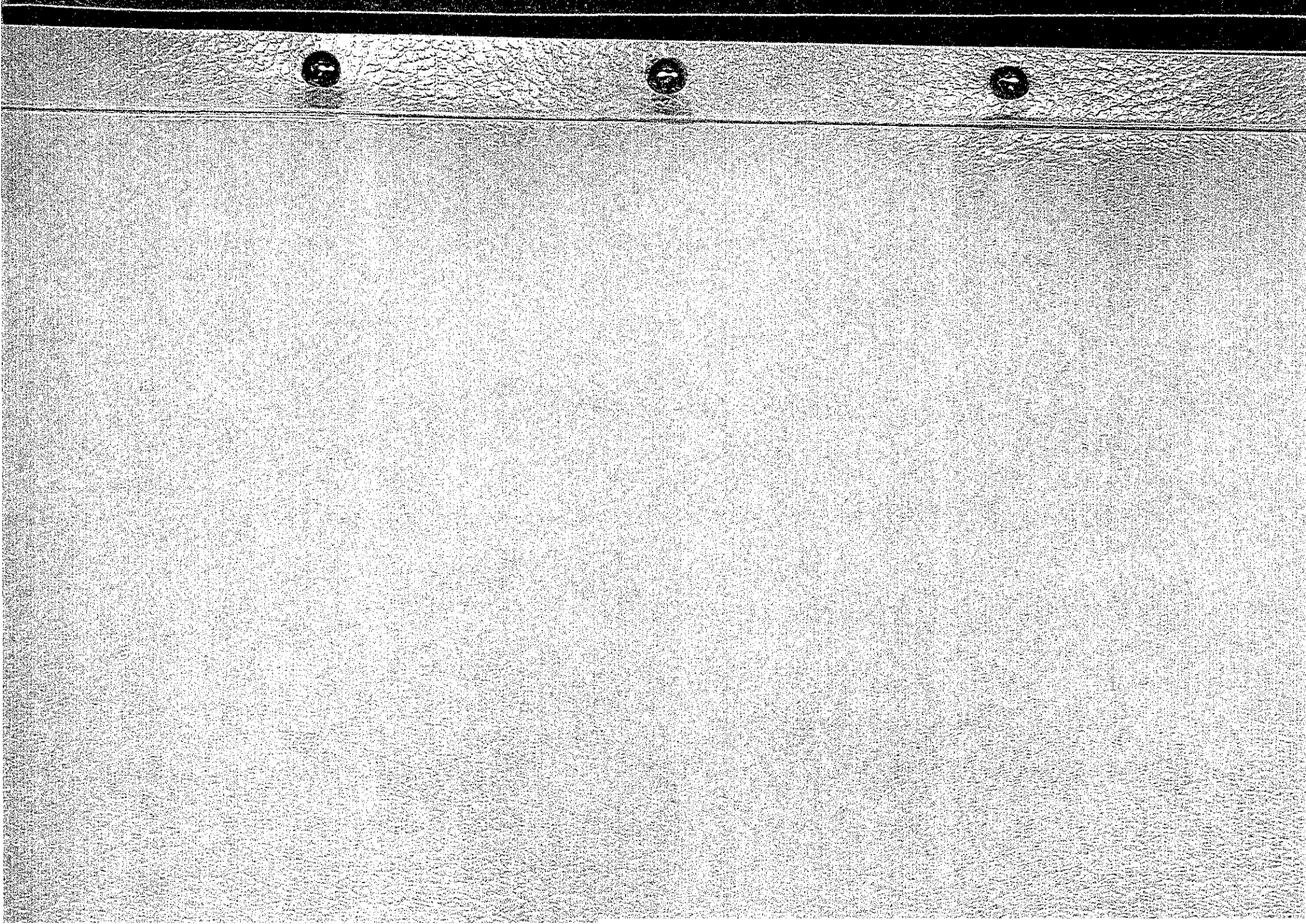
	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	6,950	9,861	15,777	24,265	37,896
Number of employees	616	653	697	1,134	1,567

7) Name of company: **P.T. DANTO INDONESIA TILE**
Address of head office: Jl. Pinangsia Timur 4-F, Jakarta-11110
Tel: 6598504
Fax: 676116
Address of factory: Jl. Raya Serpong Tangerang Km. -7 Tangerang, West Java
Tel: -
Fax: -
Name of chief executive: Yudi Lesmana
Name of responsible Person for contact: Yuri Lesmana
President Director
Year of establishment: 1977
Paid-in capital: US$ 2,500,000
Share holders:
Indonesian: 60 %
Foreign: 40 %
Legal status: PMA PMDN BRO Other
Land & factory area:
Land: 21,000 m^2
Factory: 14,000 m^2
Main production items: Wall & floor tiles
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	n.a	n.a	n.a	n.a	n.a
Number of employees	200	187	247	254	254

8) Name of company: **SINAR TERANG**
Address of head office: Padang Pasir Sedan Kec. Tujuh Belas Kab. Sambas, West Kalimantan
Tel: -
Fax: -
Address of factory: Padang Pasir Sedan Kec. Tujuh Belas, Kab Sambas, West Kalimantan
Tel: -
Fax: -
Name of chief executive: Tjhai Tiam Jin
Name of responsible Person for contact: Tjhai Tiam Jin
Manager
Year of establishment: 1980
Paid-in capital: Rp. 15,000,000
Share holders:
Indonesian: 100 %
Foreign:
Legal status: PMA PMDN BRO Other
Land & factory area: Land: 10,000 m^2
Factory: 5,000 m^2
Main production items: Water jar, basin, vase
Annual sales turnover & number of employees:

	1985	1986	1987	1988	1989
Annual sales (M. Rp.)	20	22	24	26	29
Number of employees	7	8	9	9	10



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