3. World Market Trends

As one of the integral part of the study, the world market trends of chinaware has been reviewed.

Firstly, the size of the world market for chinaware both in imports and exports was estimated, and the major consumption markets and suppliers were identified. Secondly, the influence of recent large exchange rate fluctuations, especially that of yen revaluation against the U.S. dollar after the G5 conference of September 1985, and world market trends were investigated.

The influence of the above-mentioned exchange rate fluctuations was particularly large in the U.S., which is the world's largest consumption market. Thus, the U.S. market trends have been reviewed from the view of market demand structure, change in the major suppliers or the type of products demanded.

As for Japan, the development process of the chinaware industry in the past, current situation of the industry, and the major problem areas that the industry now faces have been analyzed. After 1985, Japanese products have largely lost their competitiveness in the U.S., their most important market, and are now facing problems of lowered production volumes, the closing of factories, and the relocation of factories overseas.

Taking advantage of the lowered competitiveness of Japanese products, countries or areas such as Taiwan, Korea, Thailand, Indonesia, and China have been increasing their shares in the international market. Among them, Thailand and Indonesia, both neighbors of Malaysia, will be Malaysia's major competitors in the near future. Conditions in these two countries for such things as industrial structure, production capacity and export movements have been reviewed in this chapter.

3-1 The World Market for Chinaware

3-1-1 The General Situation

Total imports of chinaware(Note) in the world market were US$2,690 million in 1985. As regards world imports by region, North America is the largest market for chinaware, followed by Europe. Imports of the U.S.A. and Canada account for approximately half of total imports. As for world imports by country, the U.S.A. is the largest importing country, and accounts for 49.5% of total imports, followed by West Germany, 5.9%, Canada, 4.9%, France, 4.2%, and Italy, 4.0%. Imports of the U.S.A. are more than eight times those of the second highest importing country. During the period 1983 - 1985, North America's share of total world imports increased from 42.0% to 54.3%. On the other hand, that of Europe decreased from 39.0% to 31.6% during the same period. The combined share of Europe and North America, after all, increased from 81.0% to 85.9%. (Refer to Fig. VI. 3-1 and Table VI. 3-1)

Table VI.3-1 World Import Market of Chinaware

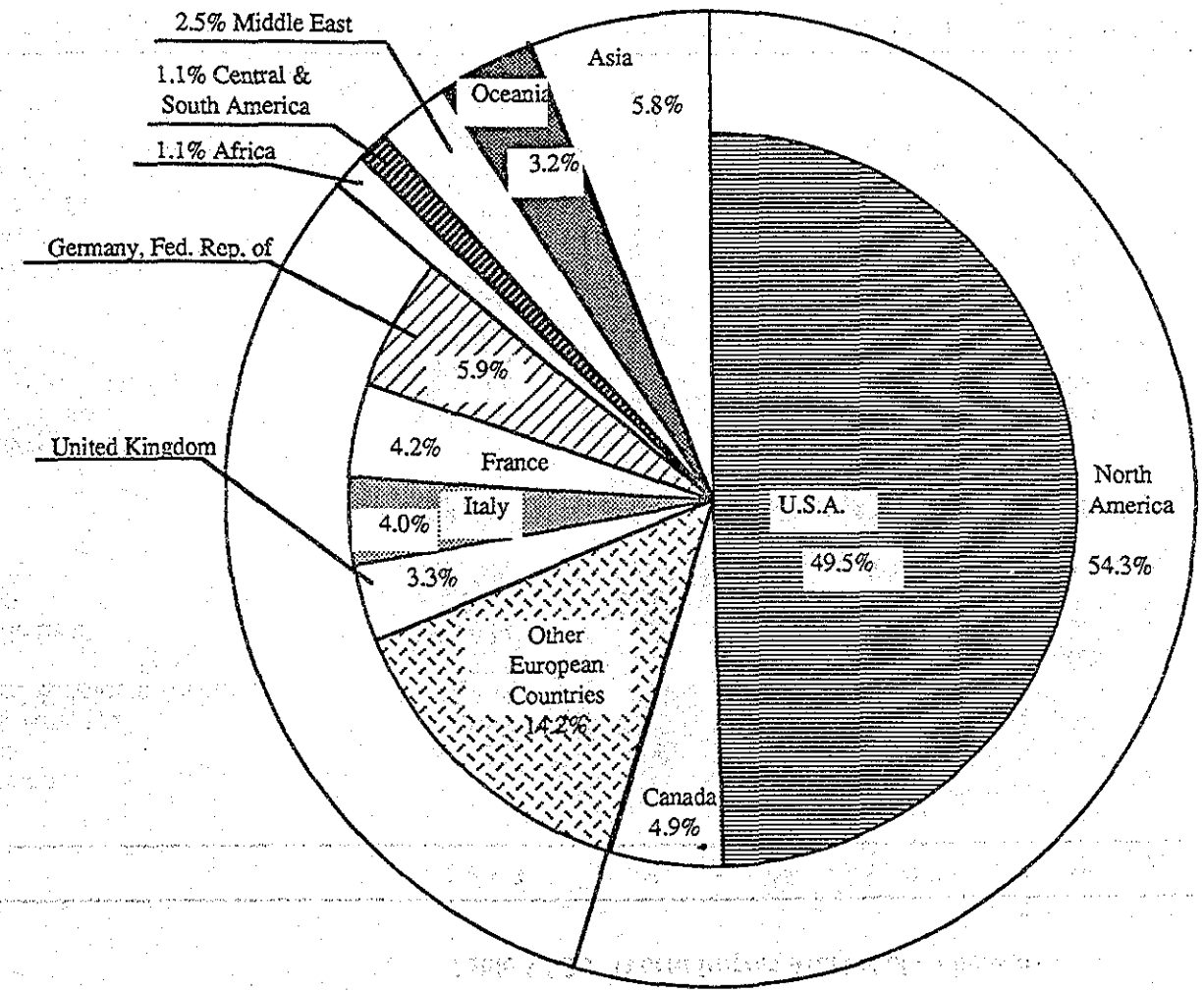
(Unit: US$ Thousand)

	1983	(%)	1984	(%)	1985	(%)
(Region)						
Africa	65,982	(2.9)	48,722	(2.0)	29,447	(1.1)
North America	1,125,688	(48.5)	1,161,698	(47.7)	1,458,665*	(54.3)
Central & Middle America	37,606	(1.6)	37,800	(1.6)	40,378	(1.5)
Asia	16,771	(0.7)	146,070	(6.0)	155,296	(5.8)
Middle East	99,424	(4.3)	79,767	(3.3)	67,123	(2.5)
Europe	905,246	(39.0)	869,682	(36.7)	848,286	(31.6)
Oceania	68,180	(2.9)	90,761	(3.7)	85,374	(3.4)
Total	2,318,898	(100.0)	2,434,500	(100.0)	2,686,561*	(100.0)
(Country/Area)						
United States	854,478	(36.8)	1,029,231	(42.3)	1,325,917	(49.5)
Germany, Fed. Rep. of	185,017	(8.0)	166,227	(6.8)	160,012	(5.9)
Canada	120,210	(5.2)	132,467	(5.4)	132,748	(4.9)
France	115,101	(5.0)	111,133	(4.6)	112,446	(4.2)
Italy	102,538	(4.4)	106,184	(4.4)	107,255	(4.0)
United Kingdom	88,737	(3.8)	95,763	(3.9)	89,541	(3.2)
Australia	56,906	(2.5)	77,787	(3.2)	73,431	(2.7)
Netherlands	71,887	(3.1)	68,551	(2.8)	62,761	(2.3)
Hong Kong	67,648	(2.9)	66,330	(2.7)	68,659	(2.6)
Belgium-Luxembourg	56,331	(2.4)	51,172	(2.1)	49,138	(1.8)
Malaysia	10,794	(0.5)	7,187	(0.3)	8,025	(0.3)
Japan	35,225	(1.5)	32,034	(1.3)	35,437	(1.3)

* This figure includes imports of US$33.869 thousand from China and Imports of 189.130 Thousand from Taiwan

Source: International Statistics Yearbook, Volume II, United Nations, 1985
US General Imports FT 150, Dec. 1985

Fig. VI.3-1 World Imports of Chinaware by Region and Country in 1985



Chinaware:
666.4 PORCELAIN OR CHINA HOUSEHOLD WARES
666.5 EARTHENWARE + STONE WR HH ARTL EX ORNTA
666.6 CERAMIC+ CHINA ORNAMENTAL ARTL NSPF

(Note) Chinaware, herein, is defined as household articles and ornamental articles of porcelain, china, earthenware, or stoneware, excluding ceramic sanitary fixtures, tiles, and ceramic ware for laboratory and chemical use.

With regard to world exports of chinaware by region, Europe is the largest supplier in the world market and accounts for 52.1% of total. North America makes up only 1.7% of total world exports. Among the Asian countries, Japan is the largest supplier. In terms of exports by country, Japan is the largest exporting country, accounting for 25.0% of the total world market, and is far ahead of the followers such as West Germany and the United Kingdom. Exports of Japan, in value, are almost double those of the United Kingdom. Because exports of the United Kingdom recorded an increase in 1985, the share of exports of the European countries in total increased during the period 1983 - 1985. (Refer to Table VI. 3-2)

Before 1985, changes took place in the world trade primarily in products for household use. As for craftwork products, the relationships between supplying countries and importing countries had been established over a long time. External trade of craft work articles had not undergone a great change. However, the rapid appreciation of the yen in recent years had brought a change in the trade of those articles as well.

The depreciation of the dollar, and simultaneous appreciation of the yen, started to move forward at the Plaza Agreement by the Group of Five in September, 1985. This has had given a significant impact on the world market and industry. Over all, chinaware exports of Japan, in yen value, decreased by 24.0% in 1986, and decreased by 15.7% in 1987. Japanese products have lost price competitiveness in the major markets, and the NIEs countries in Asia and China are really putting the pressure on Japan in those markets. Recent average annual growth rates of exports of chinaware by major Asian supplying areas are as follows:

	Average Annual Growth Rate	Period
South Korea	31.4%	1985 - 1987
Thailand	83.6%	1985 - 1986
China	2.6%	1983 - 1985
Taiwan	74.2%	1985 - 1987

Exports of chinaware by Japan showed a large decrease at an average annual rate of 20.0% during the period 1985 - 1987.

Table VI.3-2 World Export Market of Chinaware

(Unit: US$ 1,000)

	1983	(%)	1984	(%)	1985	(%)
(Region)						
Africa	1,350	(0.0)	1,405	(0.0)	1,192	(0.0)
North America	40,703	(2.3)	50,681	(2.7)	34,817	(1.7)
Central & Middle America	27,645	(1.5)	37,024	(2.0)	40,249	(1.9)
Asia	681,600	(38.0)	748,809	(40.0)	930,022	(44.0)
Middle East	3,609	(0.2)	9,859	(0.5)	4,429	(0.2)
Europe	1,035,312	(57.7)	1,021,579	(54.6)	1,100,595	(52.1)
Oceania	2,894	(0.2)	3,266	(0.2)	3,022	(0.1)
Total	1,793,113	(100.0)	1,872,553	(100.0)	2,114,326	(100.0)
(Country/Area)						
Japan	518,190	(28.9)	568,952	(30.4)	528,000	(25.0)
Germany, Fed. Rep. of	290,662	(16.2)	275,582	(14.7)	288,789	(13.7)
United Kingdom	233,001	(13.0)	223,405	(11.9)	267,324	(12.6)
Italy	170,270	(9.5)	169,494	(9.1)	173,127	(8.2)
France	83,775	(4.7)	75,396	(4.0)	80,542	(3.8)
Korea, Rep. of	72,522	(4.0)	80,191	(4.3)	73,859	(3.5)
Hong Kong	59,933	(3.3)	15,565	(3.5)	70,581	(2.3)
Denmark	45,186	(2.5)	43,186	(2.3)	41,122	(1.9)
United States	38,736	(2.2)	48,896	(2.6)	32,585	(1.5)
Belgium-Luxembourg	42,504	(2.4)	41,436	(2.2)	40,610	(1.9)
Malaysia	4,283	(0.2)	6,105	(0.3)	6,317	(0.3)
China, People's Rep. of	–	(–)	–	(–)	33,869	(1.6)
Taiwan	–	(–)	–	(–)	189,130	(9.0)

Source: International Statistics Yearbook, Volume II, United Nations, 1985
US General Imports FT 150, Dec. 1985

3-1-2 Chinaware Trade of Malaysia

Exports of Chinaware by Malaysia in 1987 were M$38.40 million, of which 74.3% were exports of novelties. The United States is the largest importing country. Exports to the United States account for 60.0% of total, followed by the Netherlands, 9.0%, Singapore, 6.2% and the United Kingdom, 3.2%.

Imports of chinaware by Malaysia amounted to M$16.96 million in 1987. Major supplying countries/areas are China, Japan, Taiwan, and South Korea. Their shares of total imports were 28.9%, 25.1%, 7.8% and 5.2%, respectively.

3-1-3 Trends of Chinaware Production in major Asian Supplying Countries/Areas

Taiwan recorded a relatively slow growth of chinaware production, an average annual growth rate of 16.3% during the period 1983-1985. Chinaware production of China increased by only 4.8% in 1985. South Korea increased its production at an average annual growth rate of 25.5% during the period 1983-1985. Chinaware production of Thailand recorded an average annual growth rate of 61.8% during the period 1982-1985. The growth of Taiwan since 1985 has been remarkable. Chinaware production of Taiwan increased by 23% in 1986. Data on chinaware production after 1985 of other major Asian countries are not available. Considering the growth of chinaware exports, the production capacities of major Asian countries have been rapidly enlarged.

South Korea firms have been expanding production facilities in response to the increase in exports. On the other hand, Korean firms need to take measures to secure their domestic market share as a result of the liberalization of import of ceramic tableware in July, 1986. Korean firms actively make efforts to improve the qualitative factors of production such as new product development and designing. For example, A Company, specialized in porcelain, developed a new product which has three times the strength of ordinary ceramic tableware. That chinaware was certified as pollution-free tableware by the FDA of the U.S.A. The Ceramic Development Corporation had developed new products with novel designs. B Company placed a heat-resistant and abrasion-resistant tableware set for household use on the market. C Company developed a product which won the first GD Mark in south Korea. The leading chinaware manufacturers in south Korea, A Company and C Company, and other major chinaware manufacturers in South

Korea, place importance on the upgrading of product quality and design research. B Company established the Integrated Design Center in April, 1986 with an investment of 400 million won. C Company established a technology laboratory with approximately 400 kinds of experimental instruments in May 1986.

3-1-4 Comparison of Products of Major Supplying Countries/Areas

When Taiwanese chinaware and Korean chinaware are compared, it is generally pointed out that Taiwanese products have better quality but are more expensive than Korean products. The reason seems to lie in the difference of the size of firms. Taiwanese manufacturers are mostly small or medium scale and they can not produce on a large scale. On the other hand, Korean manufacturers are relatively large-scale firms and they have an advantage in introducing automation facilities.

In comparison with products of Japan, Italy, and Spain, Taiwanese and Korean chinaware are regarded medium-grade products because they are inferior in quality, designing, and so forth. These inferior points arise from various techniques which are behind those of advanced nations such as techniques of body and glaze production, glazing, and firing. The designing ability is also low in developing original designs.

Chinese chinaware, which has a long-established tradition, has established a strong market position at major overseas markets. It is estimated that exports of Chinese products to those markets will steadily increase. The competition with Chinese products will be more severe for other exporting countries in the near future.

3-2 U.S.A.

3-2-1 Present Situation of the Ceramic Ware Market

(1) General consumer market environment

In 1987 sales of the U.S. retail industry increased favorably 14 to 20 percent over the previous year for high-class specialty stores dealing in high-priced products. However, some of popular department stores suffered decreases. As a result the retail industry as a whole recorded 4 to 5 percent growth. When inflation is taken into account, real growth is estimated to remain at almost a negligible level.

Also in 1988, there seems to be no possibility of the consumer economy making a great jump and stagnation is continuing. Reasons are as follows:

1. Particularly, auto loans are causing an increase in personal debt burdens.
2. Saving rate also began to drop from 7.5 percent in 1981 to 6.1 percent in 1987, and it is predicted that the growth rate will fall further to 6.0 percent in 1988.
3. Housing start began to fall from the peak of 1,820,000 units in 1986, registering a 10.9 percent decrease in 1987; and it is estimated that it will drop on additional 4 percent in 1988.
4. The after effects of the stock market crash are still felt.

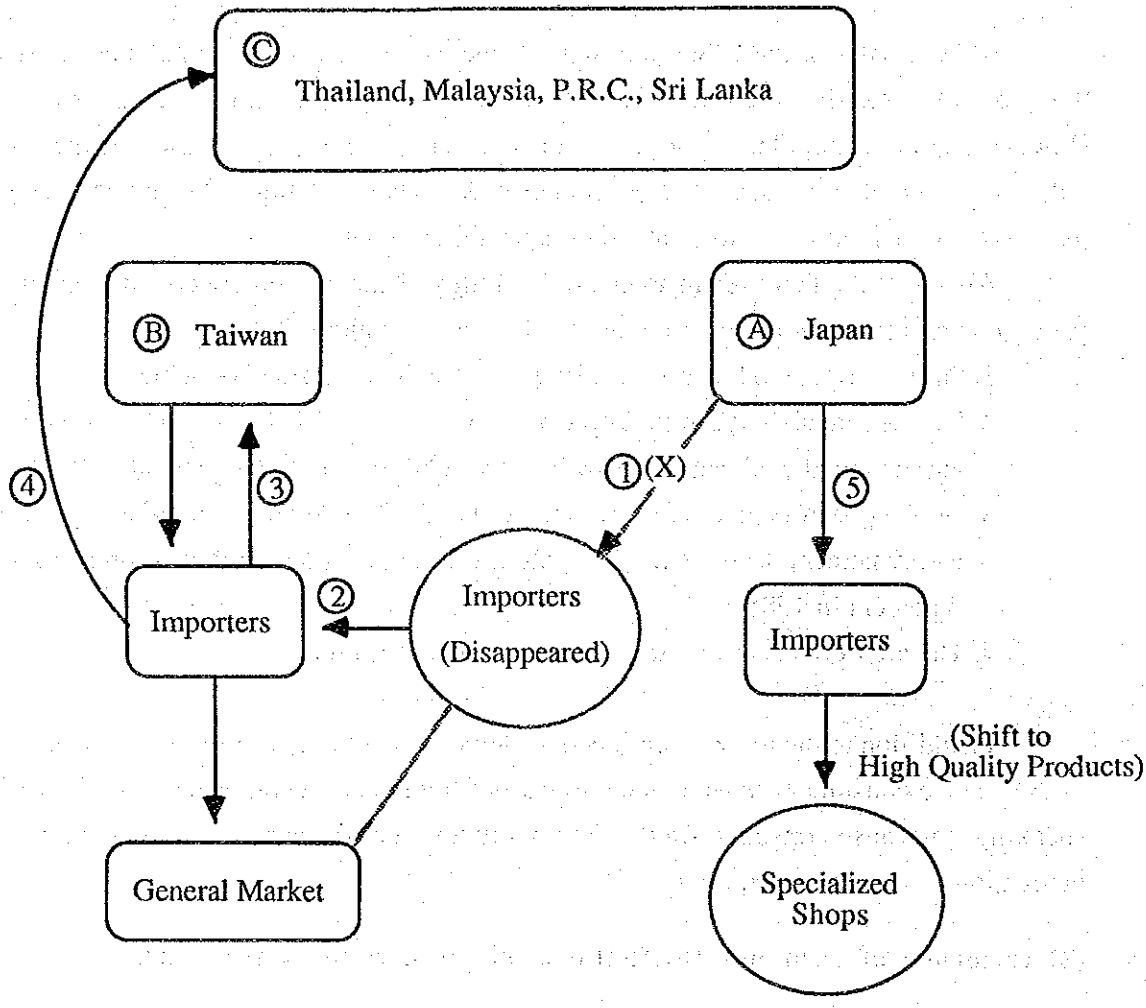
In addition to the above-mentioned negative factors, sales of furniture will stagnate in 1988 since consumers finished the purchase of big items several years ago. Generally speaking, to arouse consumption demand, including that for ceramic ware, commodity innovation measures are required.

(2) Influence of exchange fluctuations on the ceramic ware market

Shown in Fig. VI. 3-2 is the change in the U.S. ceramic ware market involved in the recent exchange fluctuations.

Since the U.S. ceramic ware market is occupied 30.2 percent by Taiwanese products and 27.8 percent by Japanese, a change in importers of products from both countries immediately surfaces in the form of a change in the market. In the face of the strong yen and weak dollar, the Japanese have tried hard to absorb cost the increase temporarily. But such an effort was aborted by the exchange rate of ¥123 to the dollar.

Fig. VI. 3-2 Influence of exchange fluctuations on the ceramic ware market



As a result, importers which once had dealt in Japanese products for the general consumer market have almost disappeared and have begun to look for Taiwanese products or Thai and Malaysian suppliers.

This does not mean that only the Japanese had suffered the aftereffects of the strong yen. Taiwanese and Koreans currencies have also begun to undergo exchange fluctuations. The currency of Taiwan which enjoys large market share in the U.S. ceramic ware market will perhaps appreciate 30 to 40 percent against the dollar. Thus, the importers of Taiwanese products have begun to give second thoughts to Taiwanese products which had been attractive because the prices were half of the Japanese products, and are looking for suppliers in other developing countries. The majority of sundries importers in New York are reportedly searching for new import channels in developing countries for this year.

Industrial analysts predict that U.S. imports of ceramic ware from Thailand and Malaysia will expand over the next 10 years.

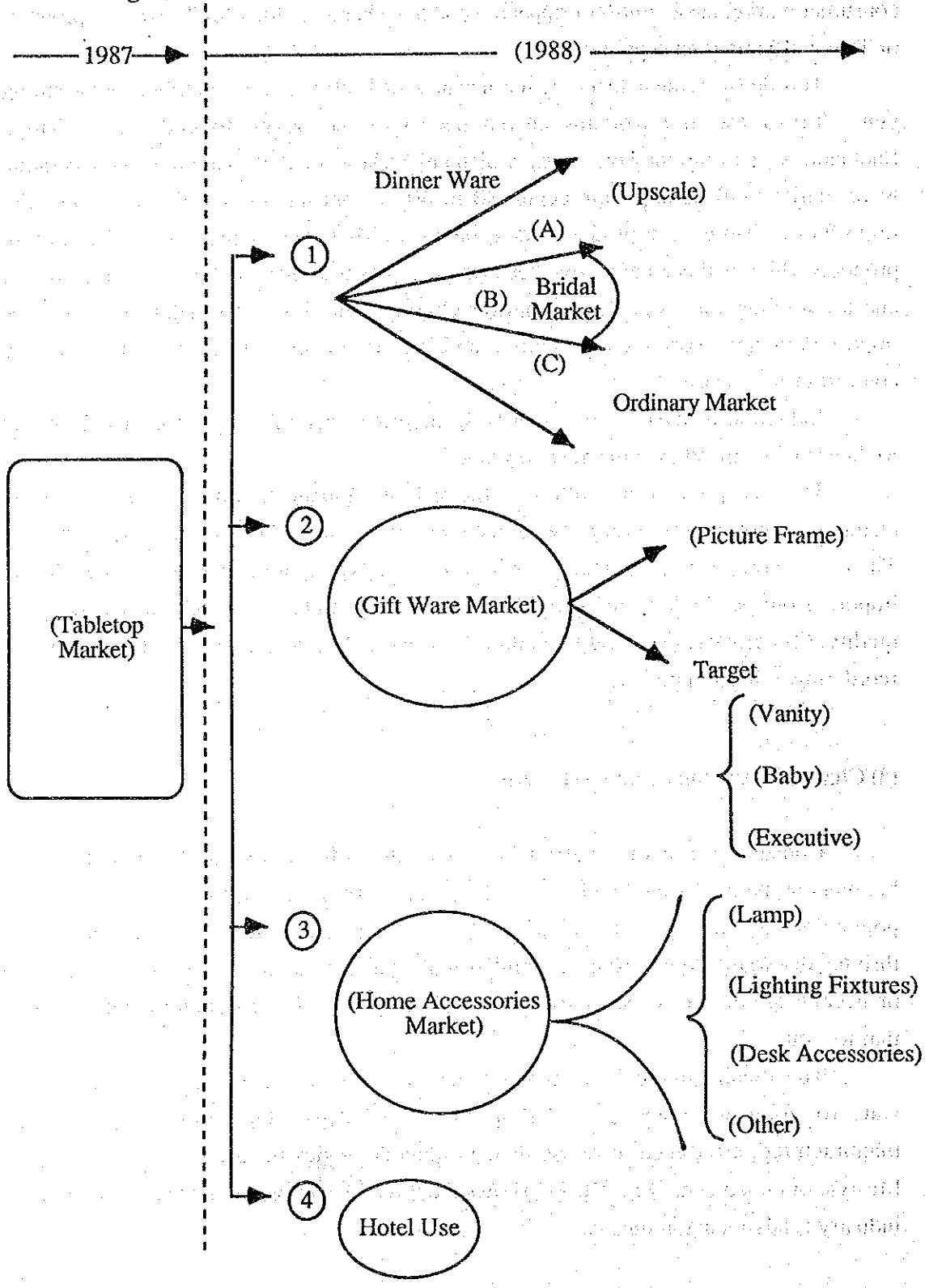
Japanese products are following the path of sophistication through specialty store channels, keeping pace with the establishment of the high-class specialty store market. The U.S. market is putting greater emphasis on quality, importers which have switched to imports from newly developing countries are required to have a knack for managing (1) quality, (2) delivery, (3) packaging and (4) services. As a result, one question is whether reordering will go smoothly.

(3) Changes in the consumption structure

Consumers' spending customs are changing radically due to the advent of baby boomers in the 25-45 age bracket. Working housewives account for half of the working population and have less opportunities to cook at home, and the food service industry is thriving due to this trend. Nuclear families with members ranging from 2.6 to 2.7 persons on average are increasing, so their interest is shifting from dinner ware for eight persons to that for four.

This change in the demographic structure is suggestive of a deadlock on ceramic ware for food and beverage and dinnerware, and department stores, importers and manufacturers are forced to revise their product strategies in response to the changing lifestyle of consumers. Fig. VI. 3-3 shows the directions in which the U.S. ceramic ware industry is advancing in unison.

Fig. VI. 3-3 The future trend of the ceramic ware industry



There are two trends in the ceramic dinner ware market. Since it is no longer possible to maintain prices due to exchange fluctuations, and two-income families form a high-priced product market with their strong purchasing power, many businesses are shifting their products to high-end products. As a result, the mass market becomes vacant, making it easier for developing countries to enter. Since the bridal market which is said to account for 30 percent of the table ware market are clearly defined and lucrative market, medium and large suppliers are making inroads in succession.

As other future growth markets the gift ware and home accessories markets are watched. Department store buyers are interested in completely renewing the image of ceramic ware and the unexpectedly high growth in consumption demand on these markets.

There are also movements in ceramic ware for the hotel market.

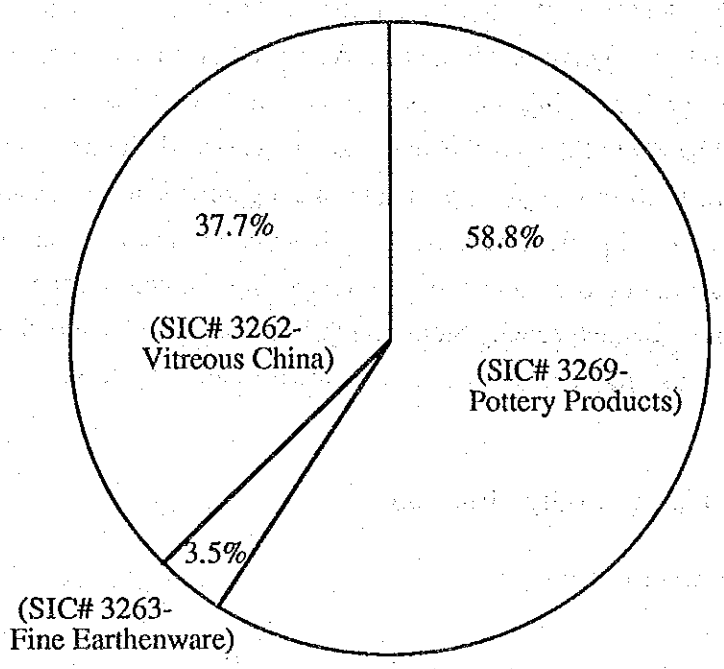
3-2-2 Demand and supply situation

(1) Domestic production

According to statistics prepared by the U.S. Department of Commerce, products covered are roughly divided in the three categories as given below.

1) (Vitreous-quality) table chinaware including table and kitchen wares.
2) (Fine) table earthenware including table and kitchen wares.
3) Pottery products including art objects, decorative items and novelties, including vases and figurines, except for those given above.

Fig. VI. 3-4 Production ratio of various ceramic ware in 1986

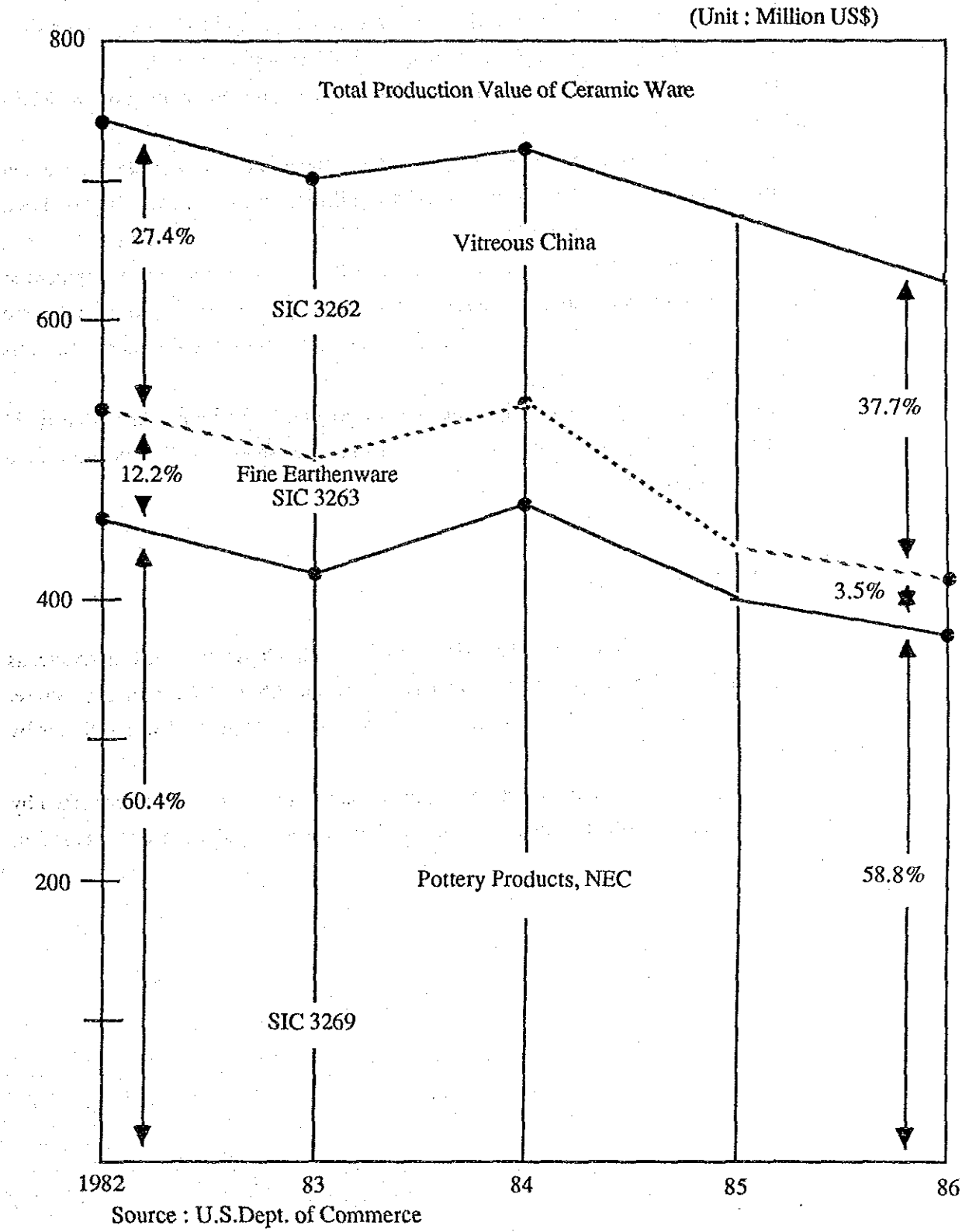


Source: U.S. Dept. of Commerce

In checking production and shipment of these product categories in 1986, vitreous china accounted for 37.7 percent, fine earthenware made up 3.5 percent and pottery products, the largest 58.8 percent. (See Fig. VI. 3-4).

U.S. ceramic ware production and shipment in 1986 decreased to $642.8 million, down 3.1 percent from the previous year. The decline has been continuing for these several years. Especially fine earthenware production has been declining, losing its share from 12.2 percent in 1982 ($91.3 million) to 3.5 percent in 1986 ($22.7 million). Pottery products manufacture also began to drop from 14 percent in 1985 to 4.8 percent or $376.1 million in 1986, after reaching the peak in 1984 ($461.9 million). (See Fig. VI. 3-5).

Fig. VI. 3-5 Trends in U.S. ceramic ware production and shipments



Source : U.S.Dept. of Commerce

Though these two items have lost production, vitreous china has gained production, registering a 7.7 percent rise to $217.1 million in 1984, 7 percent growth to $232.2 million in 1985, and 4.2 percent increase to $242.1 million in 1986.

The 1982 survey is the latest data available for seeing the breakdown of the details of products.

According to this report, vitreous china showed the highest growth (45.4 percent in 1977). But its shipment in 1982 stood at $204.8 million. Tableware for the hotel and commercial markets accounted for $145.5 million or 71 percent of the tableware shipment. This product showed high growth of 74.5 percent in 1977. Fine earthenware shipment in 1982 amounted to $91.3 million, up only a slight 0.6 percent over 1977. Home tableware accounted for 77.7 percent ($70.9 million) of the entire earthenware shipment. But this area is declining.

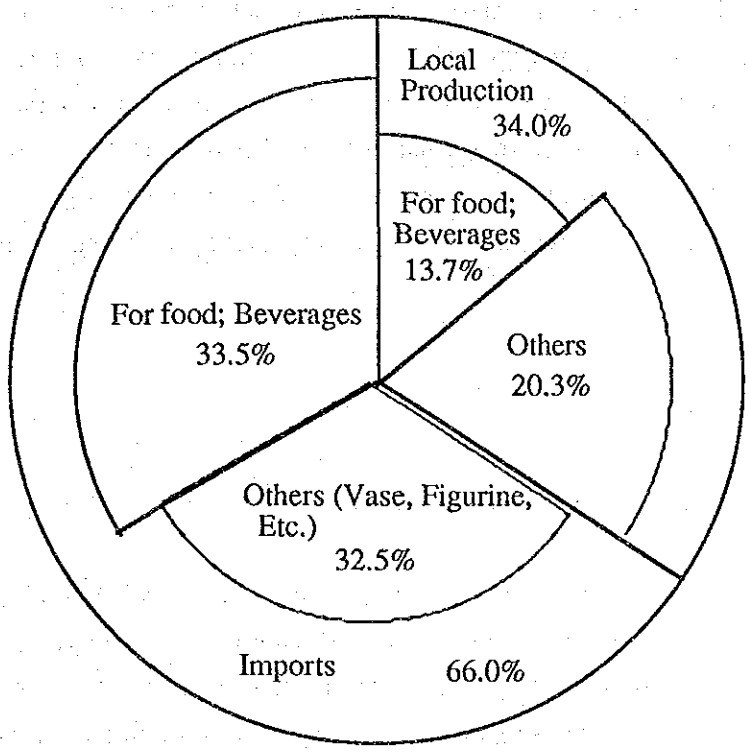
Finally, pottery products shipment in 1982 totaled $450.3 million, up hefty 87 percent from 1977. In particular vases and figurines accounted for 29.4 percent, up a substantial 197.7 percent over 1977.

(2) Market share of imports

If calculated on the basis of the 1986 data of the U.S. Department of Commerce, as shown in Fig. VI. 3-6, imports took an overwhelming 66.0 percent market share, exceeding the majority of U.S. purchases. The remaining 34.0 percent was supplier by U.S. manufacturers.

In 1983, imports accounted for 55.8 percent market share vs 44.2 percent taken by domestic products. It is obvious that imports have been increasing share over the past four years.

Fig. VI. 3-6 The market share of ceramic wares imported into the U.S.



Source: U.S. Dept of Commerce

(3) State of competition

In the U.S. ceramic ware market, U.S. products account for one-third of the market while imports occupy two-thirds. U.S. ceramics manufacturers supply the majority of their products to the hotel and commercial markets rather than the home market, thus holding a strong foothold in these markets. 58.8 percent of U.S. products are fine earthenware, most of which are art objects, decorative articles and novelties. These products have many applications and encounter less frequently with direct competition with imports.

(4) Domestic consumption

Domestic consumption of ceramic products is obvious from the trend of apparent demand in the U.S.

Apparent demand in the U.S. in 1986, as shown in Fig. VI. 3-3, reached $1,815.9 million, up 4.7 percent from the previous year. During the past five years, U.S. demand for ceramic products rose, recording a 12.2 percent increase in 1984, and 1.6 percent rise in 1985. This uptrend has been supported by the increase in imports, but the shipment of local products has been declining.

Table VI. 3-3 The trend of apparent demand for ceramic products in the U.S.

(Unit: US$ Million)

	1983	1984	1985	1986	1987
Production	698.9	723.7	663.3	642.9	--
Export (B)	27.2	32.8	23.9	25.0	33.1
Import (C)	848.3	1,015.4	1,094.9	1,198.0	1,287.9
Apparent Demand	1,520.1	1,708.3	1,734.3	1,815.9	--

Note: Apparent demand = (A) - (B) + (C)

Source: U.S. Dept.of Commerce

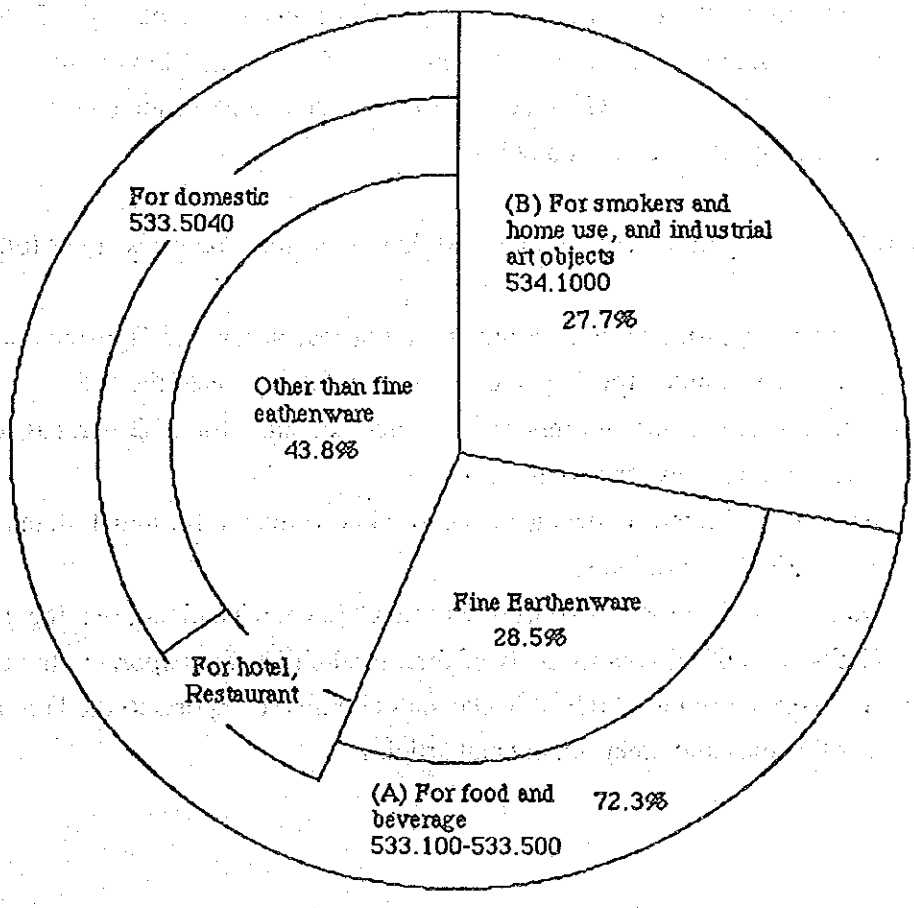
3-3-3 Imports and Exports

(1) Exports

U.S. exports began to show a sharp rise in 1987. During the past five years, U.S. exports decreased temporarily to $23.9 million, down 27 percent from the previous year, but recovered to $25 million, up 4.8 percent in 1986. In 1987, however, exports dramatically grew to $33.1 million, up 32.3 percent, thus exceeding the level of 1984.

To see the exports by item, as shown in Fig. VI. 3-7, ceramic products for food and beverage accounted for 72.3 percent ($23.9 million) and smoker's set, household articles and industrial art objects took the remaining 27.7 percent ($9.2 million).

Fig. VI. 3-7 U.S. exports of ceramic products by item in 1987



Source: U.S. Dept. of Commerce

(2) Imports

U.S. imports of ceramic ware have been continuing to grow over the past five years. In 1987 total imports in value amounted to $1,287.9 million, up 7.5 percent over the previous year. Though imports are growing steadily, the growth rate is declining. Imports in 1984, for example, registered two-digit growth of 19.7 percent ($1,015 million) over the previous year, but have been undergoing a slowdown to one-digit growth of 7.8 percent in 1985, 9.4 percent in 1988 and 7.5 percent in 1987.

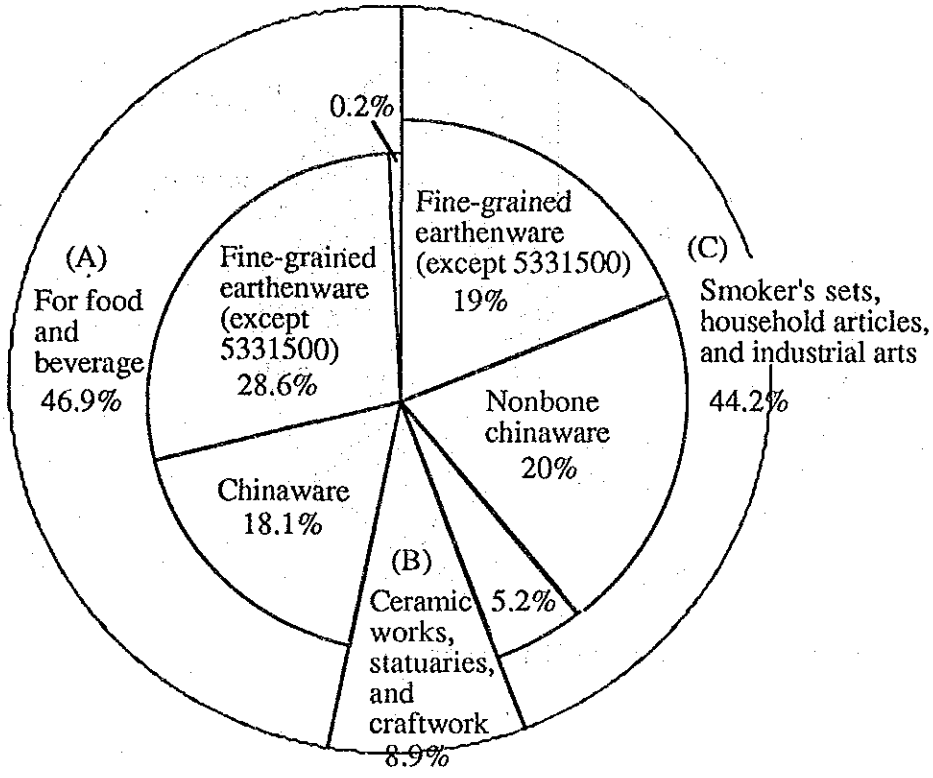
Imports by item are as shown in Fig. VI. 3-8. Ceramic ware for food and beverage such as dinnerware, mugs and cups took 46.9 percent, ceramic ware for smokers, and home use, and industrial art objects including statuaries and vases accounted for 44.2 percent, and handicrafts and ceramic art objects made up 8.9 percent.

Imports by place of origin are as shown in Fig. VI. 3-9. In terms of import value in 1987, Taiwan took 30.2 percent of total imports, followed by Japan with 27.8 percent the U.K. with 7.2 percent, Republic of Korea with 5.7 percent, China with 5.1 percent, Italy with 4.4 percent, West Germany with 4 percent and France with 2 percent, accounting for nearly 86.4 percent combined.

Products strong in the U.S. market and their exporting countries are as follows:

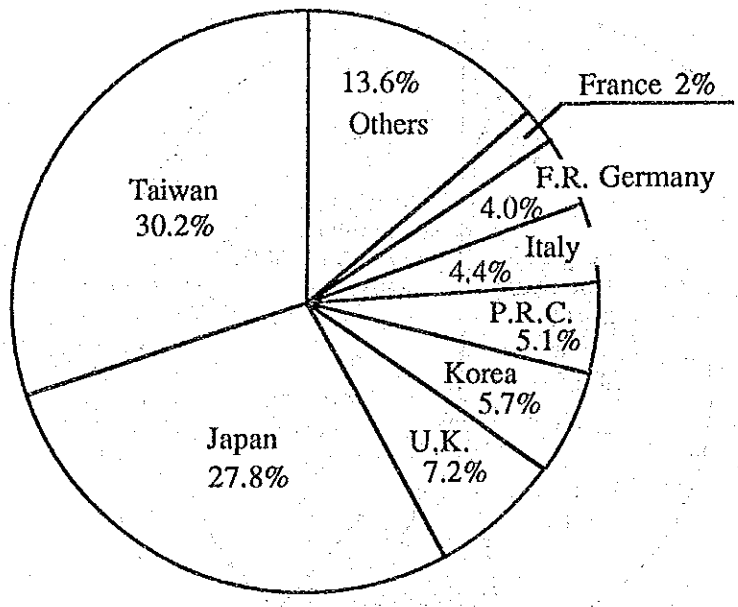
1) Taiwanese products are strong in statuaries, vases and figurines, and these products accounted for 74 percent of their total exports to the U.S.
2) Japanese are strong in dinnerware which accounts for 74.2 percent of Japan's total chinaware exports to the U.S.
3) British products are strong in the field fo dinnerware, and Italians excel in handcrafted art products.
4) Dinnerware is a major export of Korea, China and Thailand, making up 70.8%, 63.9%, and 65.6% respectively of their total chinaware exports to the U.S.
5) An overwhelming 72.0% of Malaysia's chinaware exports to the U.S. are made up of statues and other ornamental articles.

Fig. VI. 3-8 Imports of ceramic products into the U.S. by usage and item in 1987



Source: U.S. Dept of Commerce

Fig. VI. 3-9 The share of ceramic products imported by country of origin in 1987



Source: U.S. Dept. of Commerce

3-3 Japan

3-3-1 Trends in Demand and Supply

Table VI. 3-4 shows the trends in demand and supply of chinaware in the Japanese market. Chinaware is roughly classified into two categories: tableware and kitchenware; and ornamental articles and toys.

Table VI. 3-4 Supply and Demand of Chinaware in Japan

(Unit: ¥Billion)

	Domestic Production	Import	Export	Domestic[1] Consumption
Tableware and kitchenware				
1982	168.2	4.8	86.1	86.9
1983	174.2	4.3	94.5	84.0
1984	180.5	4.6	100.9	84.2
1985	173.4	5.1	94.8	83.7
1986	162.6	5.4	71.5	96.5
Ornamental articles and toys				
1982	34.2	2.8	31.3	5.7
1983	36.0	4.0	31.4	8.6
1984	37.2	3.0	36.6	3.6
1985	32.9	3.3	34.0	2.2
1986	30.1	3.8	26.5	7.4
Total				
1982	202.4	7.6	117.4	92.6
1983	210.2	8.3	125.9	92.6
1984	217.7	7.6	137.5	87.8
1985	206.3	8.4	128.8	85.9
1986	192.7	9.2	98.0	103.9

[1] Domestic consumption is, here, calculated according to the following formula.

$$\text{Domestic Consumption} = \text{Domestic Production} + \text{Import} - \text{Export}$$

Source: Statistics of General Merchandise, MITI
Monthly Trade Statistics, MOF

(1) Tableware and Kitchenware

The total amount of domestic shipment of ceramic tableware and kitchenware was ¥162.6 billion in 1986, of which approximately 50% was directed to exports. The Japanese ceramic industry is largely dependent on exports, trends of which have a considerable impact on the balance between supply and demand. The number of enterprises involved in the industry is large.

Chinaware for private use has chronically been in a state of oversupply. There are, in general, persistent demands for products which meet consumers' preference for authenticity and fashionability.

Consumers seek individualistic chinaware even for household use, and they hence tend to purchase pieces of chinaware separately. Even when they purchase tableware of kitchenware, they increasingly prefer sets with pieces which they can select freely.

The boom of white porcelain shows a tendency to cool down because it has become quite popular. For Japanese-style chinaware, major items among new products are china with a blue glaze design, traditional articles as Koimari, and chinaware with the appearance of earthenware. Among Western-style chinaware, products of noted designers' brands have established a position in the market. Another item proving a success is gift-use articles which give a luxury impression and are priced at the same price zone of gift items as before. Bone china has been rapidly gaining popularity in the Japanese market. Japanese-style chinaware manufacturers as well as Western-style chinaware manufactures display bone china as materials.

Business users such as hotel, Japanese-style inns, and restaurants seek to realize the improvement of their image and the differentiation from other by adopting tableware of high grade. Demand from business users has moved favorably on account of the increase in the construction of hotels.

Japanese chinaware has been losing competitiveness in the world market in recent years because of the increase in such costs as material cost and labor cost and because of the increasing challenges by exporters of the NIEs countries. The appreciation of the yen since the latter half of 1985 has sharply reduced the price competitiveness of Japanese chinaware. Exports of chinaware to the U.S.A., which accounted for approximately 70% of the total, decreased by 30% in the former half of 1987 compared with the same period in the previous year. During this time, exports from China and Taiwan to the U.S.A. expanded.

At the early stage of the yen appreciation, Japanese firms worked at maintaining their operations by increasing production, undertaking rationalization, and reexamining the

cost of raw materials. However, as the accelerated yen appreciation exceeded the level which Japanese firms could overcome, they were forced to decrease production, or even go out of business due to the suspension of orders. Stocks in the U.S.A. enlarged as a result of the recession in the economy and the oversupply in the product categories in which Japanese products held a major position. The necessity of adjusting excess stocks was also one of the reasons for the decrease of Japanese exports during the period.

(2) Ornamental Articles and Toys

More than 80% of total production of ceramic novelties, that is, ornamental articles and toys, is directed to exports. Taiwan has already gained an advantage over Japan in the world market in this field. The market share of Taiwanese products steadily increased from 29.6% in 1982 to 38.0% in 1986. On the other hand, that of Japanese products decreased from 27.8% to 21.4% during the same period. The market share of goods from Japan in 1986 was the lowest ever recorded. Japanese products have completely lost price competitiveness as a result of the yen appreciation. They are driven to pull back from the medium product market, which has been their main market, although they still have strength in the high grade product market. Taiwanese firms are extending their types of products from porcelain to earthenware and stoneware, and, further, to dolomite ware.

The market situation does not permit price rises. On the other hand, the production of those articles involves labor-intensive processes and the portion of labor cost to total cost is high. The Japanese industry has reached the limit for rationalization measures to reduce labor cost. There are Japanese firms which have moved their entire operations to developing countries such as Malaysia or transferred some of the production processes to overseas plants. Japanese firms are obliged to develop original products which firms of other countries can not match. To increase the added value of products by developing original designs without the reliance on buyers is considered one of those measures to find a way out of their difficulties.

The unprecedented unfavorable export environments have driven manufacturers specialized in exports to direct, in earnest, their products to the domestic market instead of overseas markets. They are making efforts to find new demand, but their articles prepared for the domestic market are mostly the same as those which have formerly been exported. Their shipments to the domestic market hence are sluggish. They get along with the development of such products as will meet the domestic consumption trends.

3-3-2 Industrial Structure of the Japanese Chinaware Industry

According to the Census of Manufacturers, there were 2,323 establishments for ceramic tableware and kitchenware manufacture and 624 establishments for ceramic ornamental articles and toys in Japan. The numbers of establishments by the size of employees are shown in Table VI. 3-5. The small-medium scale manufacturers which have less than 200 employees accounted for more than 99% of the total. The small manufacturers with less than 20 employees, in particular, accounted for 84% of total.

Table VI. 3-5 Chinaware Manufacturers by Number of Employees in Japan

Number of	Tableware and Kitchenware		Ornamental Articles and Toys	
	Number of	Number of	Number of	Number of
Employees	Establishments	Employees	Establishments	Employees
4-9	1,564	9,054	427	2,469
10-19	386	5,174	107	1,451
20-29	136	3,259	49	1,148
30-49	98	3,677	16	568
50-99	74	5,138	21	1,358
100-199	44	5,903	3	N.A.
200-299	11	2,512	-	-
200-299	11	2,512	-	-
300-499	7	2,835	1	N.A.
500-999	3	2,089	-	-
Total	2,323	39,642	624	7,783

Source: Census of Manufactures, MITI, 1982

In the major chinaware producing countries in Europe, such as the United Kingdom and West Germany, and the U.S.A., there is a total of 150-200 manufacturers, exclusive of individual pottery workshops for pleasure, which produce chinaware. This amount is almost equal to that of Japan. This means that their production per manufacturer is considerably high.

The difference in productivity between Japan and those countries comes mainly from the production process. European and U.S. manufacturers undertake the complete

production process from the refining of raw materials to glazing within the enterprise. In contrast, in the Japanese industry, most firms undertake only a single process because of the development of the division of labor.

The types of manufacturers involved in the Japanese chinaware industry are mostly classified into body (prepared clay) and glaze manufactures, unglazed pottery manufacturers, glazing manufacturers, and sagger and plaster pattern manufacturers.

The Japanese chinaware industry has a very long history and starts with the earthen vessels which were produced during the Jomon (8,000 - 200 B.C.) and the Yayoi (200 B.C. - 200 A.D.) periods. Combined with the introduction of techniques from China and the Korean peninsula, the tradition of chinaware was sustained by the prosperity of the tea ceremony during the Momoyama period (mid 16th century - early 17th century). During the Edo period (1603 - 1867), the production of chinaware was undertaken at many areas all over the country under the patronage of the feudal lords. Chinaware is today produced in all the prefectures in the country.

Aichi, Gifu, and Mie prefectures in the Tokai district are the leading producing areas of chinaware, followed by those prefectures which hold traditional producing districts, such as Saga and Nagasaki prefectures where Arita ceramic ware is produced. Kyoto prefecture is famous for Kyoto ceramic ware and Kiyomizu ceramic ware, and Ishikawa prefecture for Kutani ceramic ware.

3-3-3 Raw Materials

Japan is blessed with many natural resources needed for the chinaware industry. Many kinds of clay and pottery stone with particular characteristics are produced throughout the country. The Japanese industry can manufacture all types of chinaware, porcelain, stoneware, and earthenware.

The chinaware industry has developed in the districts where major raw materials are produced. For example, Seto ceramic ware and Mino ceramic ware were developed in Aichi and Gifu prefectures where the major Japanese plastic clays, Kibushi and Gairome are found, and these are largest producing centers in Japan. Arita ceramic ware and Hasami ceramic ware were developed in the Kyushu district, the second largest producing area, where pottery stone is found in the Amakusa and Izumuyama regions. In addition there are Kutani ceramic ware in Ishikawa prefecture, Izushi ceramic ware and Tanba Tachikui ceramic ware in Hyogo prefecture, Tobe ceramic ware in Ehime prefecture, Bizen ceramic ware, Shigaraki ceramic ware in Shiga prefecture, Mashiko ceramic ware, and

Aizu Hongo ceramic ware in Fukushima. All of these types of ceramic ware have their own characteristic features derived from the qualities of clay found in their respective regions.

The development of modern chinaware production since the Meiji era (1868 - 1912) owes not a little to imported raw materials. Kaolin for the production of high-grade porcelain is imported from South Korea and New Zealand. Plaster stone is imported from China and Morocco. Cobalt for glaze is imported form Africa. The industry also relies on imported gold ore. The imports of kaolin from New Zealand, in recent years, have increased because of the consideration toward conservation of domestic high-quality raw materials and because of the production trend toward high-grade chinaware. The possibility of using Kokudei (plastic clay) from China as a substitute for Kibushi is under study. On the other hand, the development of domestic cobalt for glazing has been promoted due to the sharp rise in the price. As a result, imports of cobalt have declined.

3-3-4 Trends of Chinaware Import

Imports of ceramic tableware and kitchenware in 1986 increased by 5% over the previous year and amounted to ¥5,300 billion. Imports from the United Kingdom, the largest exporter to Japan, were ¥2,200 billion, which accounted for approximately 40% of total imports, followed by West Germany, ¥500 billion, France, ¥400 billion, and China, ¥360 billion. Imports from neighboring countries recorded noticeable increases in the same year, although the amount of those imports was quite small. Imports from Taiwan were ¥90 billion, an increase of 128%. Imports from South Korea were ¥250 billion, up by 20%.

Imports of ceramic novelties were ¥3,800 billion in 1986. Imports of very fancy articles from the European countries are dominant. Imports from Italy were ¥1,120 billion, an increase of 1% over the previous year. Imports from West Germany decreased by 18% to ¥210 billion in 1986 against an increase of 50% in 1985. Imports from Spain moved sideways and were ¥200 billion in 1986. In contrast, significant increases were recorded by Taiwan, and increase of 86%, South Korea, 51%, and the United Kingdom, 51%. Imports from these countries were ¥510 billion, ¥600 billion, and ¥200 billion, respectively. As was the case with tableware and kitchenware, South Korea and Taiwan recorded remarkable increases. One of the reasons for their growth may lie in the fact that Japanese firms seem to import semi-finished products from those countries and finish and ship them as the progress of the international division of labor.

3-3-5 Problems of the Japanese Chinaware Industry

(1) Labor Force

The chinaware industry is a highly labor-intensive industry and the problem of securing and enriching a labor force is of importance.

One of the emerging problems is the steadily aging labor force. The reason lies in the fact that it has been difficult to retain young workers due to unattractive work contents, the low wage level, and insufficient welfare facilities at small-medium scale firms.

Labor cost, on average, accounts for 40 - 50% of total costs in the industry. For the production of some ornamental articles, the labor cost may reach 60% of total cost. The chinaware industry is faced with a steady rise in labor cost and a deteriorating labor shortage. The rate of increase in labor cost is higher than that of product price for the production of products, in particular, those for household use which involve a lot of manual processes. The industry is making efforts to take labor-saving measures and promote automation.

The difficulty in retaining young workers means that there is a lack of workers to take the place of the older workers. The production processes of chinaware are greatly separated. The processes of molding and glazing require skills, and have many techniques which have been developed over a long period of time and which are the source of the peculiarity of special chinaware of each district. Due to the shortage of young labor, these techniques are not passed on successfully.

(2) Raw Materials

The Japanese chinaware industry is blessed with abundant natural resources. The high-quality resources such as kibushi and gairome hence have tended to become gradually depleted over the years. It is necessary to discover new supplies of those resources and to improve refining techniques for the industry which tries to upgrade the quality of products.

In the future, in addition to domestic inferior raw materials and those which have not been used to date, the industry will have to use cheap or high-grade imported materials, such as kokuudei from China which is already being used as a substitute for kibushi clay, and kaolin produced in New Zealand, Indonesia, and the American state of Georgia. In addition, research should be undertaken into synthetic and compound materials and artificial clays.

(3) Competition with the Developing Countries

Various developing countries have made strenuous efforts to promote their chinaware industries. Some examples are China, which has promoted tableware, Taiwan, novelties, and South Korea, tableware and tiles. In addition, such countries as Thailand, Singapore, the Philippines, India, Sri Lanka and Brazil also have promoted the development of the chinaware industry. What is more, many of these countries have received technical cooperation from Japan. In recent years, chinaware produced in those countries has gradually been appearing on the international market.

In general, developing countries, with their advantage of low price, make use of such import systems as the provision of preferential tariff rates to make inroads into overseas markets. On the contrary, Japan is now in a considerably disadvantageous position in many overseas markets including Japan's major markets such as Europe and the U.S.A. because those markets set quotas on imports from Japan or high customs duties for the purpose of protecting domestic industry. European and U.S. manufacturers of noted brands, which have mainly targeted the high-quality product market, are making inroads into the medium-grade product market, which is the main target of Japanese products, in the international market. Japan has been faced with severe competition from developing countries which are catching up and the advanced nations which have begun to make inroads from the top.

3-4 Thailand

3-4-1 Production

(1) The Number of Plants and Their Capacities

Ceramic industry in Thailand has started from cottage industry and developed continuously to produce in larger scale. The products are presently exported to foreign markets. The government has seen the future of this industry and therefore has assigned many related agencies to develop and promote this sector to be an export oriented industry especially kitchenware (including tableware) and ornamental ware products.

Presently Thailand has developed and produced kitchenwares and ornamental wares of ceramic for import substitution. The amounts of imported tablewares, kitchenwares and ornamental wares of ceramics have decreased substantially since 1984. On the other hand, export of these products started to increase gradually.

The ceramic manufacturers are mainly divided into 2 groups by the factory size, level of technology, and management style as follows:

Group 1 include 10 BOI-promoted or medium-size firms which have a combined annual capacity of 31,175 tons/year. The details of the 10 firms are presented in Table VI. 3-6. The manufacturers in this group mostly produce medium to high quality tablewares for mainly institutional users such as first grade hotels, restaurants, and high income bracket households. Part of products produced has also been exported. It is estimated that the volume of medium to high grade tablewares production represent about 40% of total tablewares production in the country. The production are in large scale and use modern technology. Factory management is generally carried by professional managers who have been trained in ceramic production.

Group II include about 60 small ceramic factories which mainly produce tablewares and kitchenwares, and other about 80 factories mainly produce ceramic ornamental wares. Their production are mostly hand-made with special designs, are produced in small scale and use simple technology. The small ceramic tableware and kitchenware factories have a combined production capacity of about 20,500 tons/year. Part of the products, especially ornamental wares and tablewares are also exported, but the main customers are individuals or households instead of institutional customers. Corporate management are dominated by family members of the owners which use individual family management styles.

Past production statistic can be found only of kitchenwares (tablewares) produced by the BOI promoted firms which increased from 9,281 tons in 1,976 to 13,770 tons in 1985. The average increase during this 10-year period is 11% per annum.

Table VI. 3-6 BOI Promoted Firms of Ceramic Kitchenware

		Annual Capacity (Ton/year)	Registered Capital (Mil.Baht)	No. of Employees	Location
1.	S.P. Ceramic Co., Ltd.	8,400	40	1,047	Samut Sakorn
2.	Lotus Ceramic Co., Ltd.	4,500	70	511	Samut Sakorn
3.	Eastern Chinaware Co., Ltd.	3,200	15	160	Bangkok
4.	Thailand Tableware Co., Ltd.	1,035	1	70	Lampang
5.	Chour Lampang Earthenware Co., Ltd.	2,240	2	90	Lampang
6.	T.G. Ceramic Co., Ltd.	2,500	100	540	Saraburi
7.	Central Ceramic Co., Ltd.	3,000	40	200	Saraburi
8.	Asia Porcelain Industry Co., Ltd.	2,000	25	275	Saraburi
9.	Lampang Silpa Nakorn Co., Ltd.	1,800	16	292	Lampang
*10.	Asia Ceramic Industry Co., Ltd.	2,500	70	241	Saraburi
	Total	31,175	379	3,426	

Note: No. 4 is not being promoted
No. 10 is no longer in operation

Source: Industrial Economic Planning Division
Ministry of Industry

(2) Production System

All largest 10 factories have concentrated in producing tablewares of stoneware or porcelain. Most of them have received technical know-how from foreign countries, for example Japan and West Germany. The machinery and equipment are mixed between imported and local made. The imported machinery and equipment are mainly kilns, ceramic machinery, SIC plates, and alumina leg, etc. The local machinery and equipment are, for example, ball mill, vibratory sieve, slip tank, kiln materials, kiln cars, and electrical system.

The small scale factories mainly produce ornamental wares, premium products. Special design tablewares, and medium and low-grade tablewares. They mainly use local machinery and equipment which are generally obsolete by international standard. On the other hand they are using more labor in the production process.

Product design is a major problem in the production system. There are very limited outstanding designers especially for the small-scale factories.

(3) Labor Problems

For the large manufacturers which are capital intensive, there are not many reports on labor problems. The small-scale family operated factories which are labor-intensive have some labor problems which can be summarized below.

- Shortage of skilled workers and product designers,
- High turnover of personnel, and
- Low productivity because of insufficient production management skill.

The Thai Government, which has given attention on the development of ceramic industry, has provided trainings in both production technique and labor skill consistently.

(4) Cost Structure

Thailand has lower labor and raw material costs compared with competitive countries. Production of ceramic kitchenware and ornamental ware will have labor cost at about 20-26% of total production cost while raw materials cost will be about 24-28% of total production cost for both types of products. However, Thailand has to import crude oil, machines and accessories, which are the disadvantages compared with competitive countries which can produce their own machinery and equipment.

(5) Safety Standard, Regulations, and Production Inspections

In order to prevent lead-poisoning, the Thai Industrial Standard Institute, issued regulations for permissible limits of lead and cadmium as Table VI. 3-7.

Table VI. 3-7. TIS Standard for Ceramic Ware in Contact with Food (Porcelainware, Earthenware and Stoneware)

Type	Measurement	Permissible Limits Lead	Cadmium
Flatware	Mg/Sq.dm.	1.7	0.17
Small hollow ware	Mg./Cu.dm.	5.0	0.50
Large hollow ware	Mg./Cu.dm.	2.5	0.25

Source:Thai Industrial Standards Institute, Ministry of Industry

The Thai Industrial Standard (TIS) is a system guaranteeing the quality of products, based on The National Industrial Product Standard Act. The certification scheme of TIS is a third-party certification carried out through the issuing of licences to use the Standard Mark to the manufacturers whose products are in conformity with the standard concerned. Standards Codes for porcelainware, earthenware and stone ware are listed as Table VI. 3-8.

Table VI. 3-8. TIS Standard for Impact Strength (IS) and Chipping Resistance (CR)

Products	Size	IS	CR (N.Metre)
Porcelain Ware			
(1) Bowl/Cup	All size	0.04	-
(2) Plates	ø < 200 mm.	0.06	0.10
	ø > 200 mm.	0.06	0.12
Earthen Ware			
(1) Bowl/Cup	All size	0.10	-
(2) Plates	ø < 200 mm.	0.14	0.16
	ø > 200 mm.	0.20	0.19
Stone Ware			
(1) Bowl/Cup	All size	0.04	-
(2) Plates	ø < 200 mm.	0.06	0.10
	ø > 200 mm.	0.08	0.12

3-4-2 Raw Materials

Raw materials are largely locally available, with the exception of minor chemicals and decorative transfer paper which need to be imported. Locally procured raw materials are kaolin, feldspar, limestone, silica sand, dolomite, and ball clay. Imported raw materials compose of pigments, transfer paper and others minor chemicals. Production statistic of main local ceramic raw materials are shown in Table 6. From Table VI. 3-9, it can be seen that the production statistics of all raw materials increased substantially, especially during the last 3 years.

Table VI. 3-9. Production of Ceramic Raw Materials

(Unit: Tons)

Year	Kaolin	Ball Clay	Feldspar	Quartz	Pyrophyllite	Silica Sand
1978	33,764	n.a.	32,583	22,200	n.a.	170,227
1979	42,768	1,766	26,428	27,240	n.a.	157,076
1980	19,934	1,557	24,158	7,828	10,350	171,000
1981	14,086	1,856	24,243	n.a.	10,370	76,330
1982	17,846	2,200	19,326	n.a.	19,989	82,820
1983	36,350	4,960	47,908	n.a.	18,875	116,094
1984	58,161	2,520	74,404	n.a.	26,851	166,787
1985	106,704	7,988	104,586	n.a.	42,002	152,133
1986	132,155	11,203	115,163	n.a.	36,165	153,565
1987	184,179	57,719	164,635	n.a.	37,749	153,516

n.a. = Not Available

Source: Department of Mineral Resources

In small and medium scale factories, preparation of raw materials of each product depends upon experiences of workers or owners without assistance of efficient tools. So, it will cause the high percentage of defect in production process. Moreover, the finished product is not standardized in size, and design. This is opposite to the large factories which modern machinery and equipment are used.

Guideline information on Thailand ceramic raw materials are as follows:

(1) Ranong Clay

Clay structure is disordered kaolinite, some muscovite; small amounts of albite and microcline; trace of gibbsite.

The results of chemical analysis of this clay are as follows:

SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	K_2O	Na_2O	L.O.I
49.58	33.03	1.18	0.17	0.88	2.45	0.34	12.28

This clay is widely used for whiteware industry.

(2) Surathani Clay

Clay structure is disordered kaolinite; some illitic mica; small amount of montmorillonite; traces of microcline feldspar and chlorite.

The results of chemical analysis of this clay are as follows:

SiO_2	TiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	K_2O	Na_2O	L.O.I
43.21	0.46	22.94	2.02	0.90	0.44	2.45	0.34	27.1

This clay has a very good plasticity, but iron content is slightly high, the small amount has been used in local porcelain manufacture.

(3) Tak Feldspar

The results of chemical analysis of this clay are as follows:

SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	L.O.I
67.5	18.4	0.03	0.60	0.12	2.5	9.5	0.96

(4) Washed Sand

The results of chemical analysis of this clay are as follows:

SiO_2	Al_2O_3	Fe_2O_3	Na_2O	L.O.I
98.8	0.30	0.04	0.05	0.32

This sand has been used in sanitary ware manufacture.

(5) Tak Quartz

Quartz has approx 99.7% SiO_2 content and is using in local porcelain manufacture.

(6) Lampang Pottery Stone

The results of chemical analysis of this clay are as follows:

SiO_2	Al_2O_3	TiO_2	Fe_2O_3	MgO	CaO	Na_2O	K_2O	L.O.I
78.20	16.00	0.03	0.53	0.10	0.08	1.50	3.05	2.54

This pottery stone is widely used for whiteware industries.

3-4-3 Exports

(1) Trends in Exports

Both kitchenware and ornamental ware of ceramics have been developed continuously both in quality and design which are partly assisted by governmental agencies. Presently they are widely acceptable in local and export markets. Export orientation has become an important aim of this industry.

As shown in Table VI. 3-10, exports of tablewares/kitchenwares and ornamental wares from Thailand increased gradually during 1978 to 1984. From 1985, exports started to increase at much higher rate, especially in 1987 exports jumped 3.8 times, and 2.5 times compared to those of 1985 and 1986, respectively. The products which have highest increasing export rate and also have highest export value in 1987 (77.54 million baht) are tableware/kitchenware of porcelain. The products which have the second highest export value in 1987 (44.75 million baht) and have consistently increasing trend over the last 10 years are furniture of other pottery. Other products which have high export potential are tablewares/kitchenwares of other pottery, furniture of porcelain, and statuettes in that order which the export volume in 1987 were 43.26 million baht, 18.07 million baht, and 13.08 million baht, respectively. Other ornamental wares such as personal adornment and others have limited export potential.

Table VI.3-10 Export Statistics of Tableware/Kitchenware and Ornamentalware classified by Product

Unit : Million Baht

Items	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Tableware/ Kitchenware of Porcelain	1.60	1.60	3.30	3.60	5.90	2.93	4.19	3.58	19.02	77.54
Tableware/ Kitchenware of Porcelain	0.70	1.50	3.50	7.50	10.60	4.67	3.42	20.44	9.54	43.26
Furniture of Porcelain	0.70	0.70	0.80	0.50	3.10	3.60	2.88	8.20	9.96	18.07
Furniture of Other pottery	0.70	0.70	1.80	2.10	2.80	3.90	5.55	16.48	35.01	44.75
Statuettes	0.09	0.20	0.20	0.70	1.50	0.49	0.59	2.36	5.02	13.08
Personal Adornment of Porcelain	0.60	0.20	0.02	0.20	0.02	-	0.02	0.002	0.004	0.45
Personal Adornment of Other Pottery	0.06	0.003	-	-	-	-	-	0.005	0.16	0.93
Other Ornaments of Porcelain	1.20	1.10	3.40	2.50	0.60	0.22	0.06	0.05	0.07	0.01
Other Ornaments of Other Pottery	0.40	0.80	2.20	5.60	2.80	2.16	5.18	1.08	0.55	0.23

Source : Department of Customs

(2) Exports by Country of Destination

The biggest market of Thai tablewares/kitchenwares and ornamental wares is the United States. The other important markets are EEC countries, Australia, Japan, and Hong Kong.

The two most important markets of tableware/kitchenware of porcelain or china from Thailand are United States and Australia which imported 476.9 tons at 22.3 million baht, and 214.3 tons at 14.2 million baht in 1987, respectively. In the same year, the Netherlands imported 130.9 tons at 6.7 million baht, Italy imported 117.5 tons at 5.9 million baht, United Kingdom imported 78.8 tons at 4.8 million baht, Canada imported 95.7 tons at 4.0 million baht, New Zealand imported 73.3 tons at 4.0 million baht.

The only important market for tablewares/kitchenwares of other pottery is U.S.A. which imported 17.0 million baht in 1985, 5.6 million baht in 1986, and 26.5 million baht in 1987 from Thailand. Other countries which can be important markets for these products in the future are Belgium, West Germany, Japan, Hong Kong, and Australia which imported 6.2 million baht, 3.0 million baht, 2.4 million baht, 1.2 million baht, and 0.7 million baht from Thailand in 1987, respectively.

The major importer of furniture of porcelain or china is U.S.A., followed by Japan, France, West Germany, United Kingdom, Australia, and Hong Kong.

There are many countries which consistently imported furniture of other pottery from Thailand in the past. These countries include U.S.A., Hong Kong, West Germany, Australia, France, Japan, the Netherlands, U.K., and Denmark. The first four most important importing countries during the last three years are U.S.A., Australia, West Germany, and France.

Look at the past export statistic of statuettes from Thailand, the potential export markets for statuettes will be U.S.A., France, Hong Kong, and Japan. Other countries imported only in small values.

(3) Export Activities and Problems

The United States require certain limits of lead and cadmium contents according to the U.S. standard. Products exported from Thailand to U.S.A. must have certificate from the Department of Science for lead and cadmium contents. Most other importing countries do not require such certificate.

Most customers are department stores in importing countries. The exporters in Thailand approach their customers through their branch offices in respective countries.

Some importers approach the manufacturers in Thailand directly by sending samples to them for price quoting. The price will be quoted by the manufacturers if the products can be produced at the quantity and quality specified.

Almost all large manufacturers who concentrate on producing tablewares/kitchenwares have their own product products which can be exported at satisfactory prices. However, most production are made according to the customers' samples or designs. The opportunity to export the factory-designed products are still limited.

On the ornamental products which were mainly produced by smaller factories, there are more factory-designed products. These products are generally produced in small quantities. Therefore, there are more uniqueness in each production lot. However, from the opinion of the exporters who are closed to the customers, the neatness in color, texture, and overall design still need improvements in order to meet the customers' requirements.

The main instrument for overseas market development is trade exhibition in both domestic and overseas. This activity has been conducted frequently. In addition to the privately-organized trade-fairs, the government through its Export Promotion Department and Commercial Attache in importing countries, have provided great assistances to the ceramic exporters. Direct visits to customers in foreign countries have been conducted regularly by the representatives of international trading firms from Thailand.

Although Thailand has many advantages in ceramic production such as possessing all major raw materials and low labor cost, other countries also have other advantages. The major competitors of Thailand are Taiwan, Japan, and China. Taiwan has better technology, while Japan has both better technology and design. China has more raw materials and cheaper labor rate.

3-4-4 Imports

Thailand has imported both kitchenwares and ornamental wares. The import value decreased yearly because the present production capability can be developed to substitute imported products. Statuettes ware the biggest imported item in 1987.

The import value of kitchenwares during 1983-1987 were 3.0, 3.5, 2.2, 7.1 and 0.4 million baht, respectively. Ornamental wares have been imported during 1983-1987 in the amounts of 7.6, 6.7, 7.2, 7.1 and 9.5 million baht, respectively.

Both types of products are imported from China, Taiwan, Japan, Italy and Hong Kong.

3-4-5 Government Policy

There are three main government regulations which involve ceramic industries: tax incentives for export products; incentives involving locations of factories; and those specifically apply to ceramic industry are minimum initial investment of the projects and minimum percentage of export to total production.

BOI specifies the conditions for promoting ceramic products industry as Table VI. 3-11.

Table VI. 3-11 Conditions for Promoted Ceramic Industry

Type of Activity	1/ MCR	/2 MTS	3/ MEL	Other conditions
- Glazed pottery for export	-	-	80%	1. F.O.B. export value to be not less than 80% of total annual sales
- Stoneware and porcelain	Baht 50m.	-	-	1. For initial project, Baht 20 m. for expansion project
- Bone China	Baht 20m.	-	-	

Note: 1/ The MCR = Minimum Capital Required, excludes the cost of land and working capital

2/ The MTS = Minimum Thai Shareholding, is the percentage of shares which Thai
National must hold.

3/ The MEL = Minimum Export Level, is The percentage of sales value which must be exported.

3-5 Indonesia

3-5-1 Production

(1) Number of Plants and Their Capacities

Ceramic industry, notably the production of ornamental wares, dates back to the 1930s, but the industry then constituted home/cottage industrial operations with traditional production methods to make cooking utensils, plates, water jugs, flower pots etc.

However, the industry began to develop rapidly in the 1970s soon after the introduction of modern technology from abroad. Indonesia is now capable of manufacturing a wide range of ceramic products such as plates, cups, saucers, teapots, tea and coffee sets and ornamental wares. Nevertheless, cottage industries which produce flower pots, money boxes and traditional cooking utensils continue to grow because they still have their own market segment.

There are now eleven companies in Indonesia which manufacture ceramic and porcelain tablewares and ornamental wares with modern technology. These companies produce a wide range of wares such as plates, cups and saucers, bowls, tea and coffee sets. Ten of the companies are based in Java and one which makes ornamental wares operates in Bali. The largest of the companies are PT Sango Ceramics in Semarang which has an annual production capacity of 6 million dozens and PT Lucky Indah Keramik with an annual production capacity of 3 million dozens.

In addition to the eleven major companies, there are many other smaller producers which mostly make ornamental wares such as statues, flower pots and vases, money boxes, toys, chairs. They usually operate as home/cottage industries mostly in Cikampek, Malang, Bali and Yogyakarta. There are no reliable figures on the number of the small producers but sources at the industry ministry estimate their total production capacity at 1,000 tons a year.

There is another company, PT Indi Decorindo, which specializes in making decorations on ceramic products. This company which is based in Semarang makes decorations mostly for PT Sango Ceramics Indonesia and PT Queen Setyabudhi, both in Semarang.

(2) Production System

The ten major companies which produce kitchenwares use modern machinery and equipment in their production process. Only plants producing ornamental wares still use manual operations in most of their production processes such as mixing, printing, decorating and dyeing.

Kitchenware producers use manual operations only for finishing and decorating processes. For example, PT Crown Porcelain uses mixers from Taiwan and firing, printing and heating equipment from Japan.

(3) Labor Problems

Indonesia is still short of skilled manpower for modern ceramic plants. Indonesian workers still work mostly as assistants to expatriates in modern plants. Most ceramic companies which use modern technology to produce fine-quality ceramic wares usually hire expatriates.

Modern ceramic companies in Indonesia hire expatriates mostly from the countries of origin of their machinery/equipment and in many cases from Japan (the largest supplier of machinery). Some other companies hire expatriates from Taiwan and China.

For example, PT Sango Ceramics Indonesia employs mostly experts from Japan because its machinery/equipment were procured from Japan. Even its technical manager is a Japanese.

(4) Rough Estimates of Production Costs

The production costs of ceramic products in Indonesia should theoretically be lower than in other countries because of the local availability of main basic materials such as clay, kaolin and quartz. But since auxiliary materials such as pigments, frits, and other chemical ingredients must still be imported, local ceramic production costs are still relatively high.

According to several producers, the import costs of chemicals are even much larger than the cost of procuring local materials such as clay, kaolin and quartz. Imported chemicals, according to the producers, account for 60% of the total material costs.

Companies which produce high-quality ceramics also must rely on imported kaolin, clays and feldspar, thereby making their production costs even much higher.

Further adding to the production costs are total dependence on imported production machinery and equipment and the necessity to hire expatriates for production operations and quality control.

Generally speaking, the production costs of ceramics, notably kitchenware, in Indonesia are much higher than in other countries, especially because the productivity of local workers is still lower compared to the overseas.

(5) Quality Requirements

The Ministry of Industry has set quality standards for several kitchenwares made from ceramic or porcelain. The products for which quality standards have been set are:

- Dinner sets of vitrified china and porcelain for hotels
- Tea and coffee cups for households made from porcelain or semi-porcelain materials
- Ceramic dinner sets (tablewares)
- Fine glazed tablewares.

The quality requirements cover: water absorption, the strength of the surface, methods of production and impact resistance. Quality requirements have also been prescribed for the prevention of contamination due to the dissolution of lead (Pb) and cadmium (Cd) into glazed tablewares.

Companies whose products fulfill the quality requirements or standards can obtain or use the Standard Industri Indonesia, SII, (Indonesian Industrial Quality Standard Certificate). However, many producers do not bother to meet the SII standards. Several producers even follow or conform with foreign quality standards such as JIS, European and American quality standards.

3-5-2 Raw Materials

(1) Kaolin

Kaolin production in Indonesia rose to 132,239 tons in 1986 and was estimated at 150,000 tons in 1987 Kaolin deposits in Indonesia are located mostly in Sumatra, Java, Kalimantan and Sulawesi. Kaolin minings are made mostly on Bangka and Belitung islands in South Sumatra and Central and East Java.

However, kaolin for making high-quality ceramic wares is still imported because, according to producers, local kaolin is not so suitable for producing fine-quality wares. Indonesia kaolin imports amounted to 27,957 tons in 1987, up from 19,460 tons in 1986.

Imports were made mainly from the United States: China, Japan and Australia. Imports from the United States in 1987 amounted to 15,735 tons or 57% of the total imports, from China 3,876 tons, from Japan 2,853 tons and from Australia 2,570 tons.

(2) Clay

Clay deposits are available in Aceh, notably Lhok Seumawe, Langsa and Lhok Nga, in North Sumatra, especially Tarutung, in Jambi, in Bukittinggi (West Sumatra), in West Java (Bogor, Cikadut, Bandung and Sukabumi), in Central Java (Banyumas, Banjarnegara, Magelang, Kebumen and Cilacap), in East Java (Gresik) and in Sulawesi and West, Central and East Kalimantan.

Indonesia, however, still imports clay of high quality even though in small volume. Clay imports amounted to 2,432 tons valued at US$756,000 in 1987, down from 5,848 tons worth US$886,000 in 1985 and 4,908 tons valued at US$772,000 in 1986.

(3) Quartz

Quartz is currently quarried in Java, Madura, Belitung, West Sumatra, Lampung, North Sumatra, Riau, East Kalimantan, and South. Sulawesi as of 1986, there were 32 companies engaged in quartz quarrying mostly in Belitung and West Java.

Indonesian quartz production rose from 372,216 tons in 1983 to 782,620 tons in 1986. West Java accounted for 671,309 tons or 85.8% of the total production in 1986.

(4) Feldspar

According to the Ministry of Mines and Energy, feldspar has been mined only in Blitar regency, East Java by PT Candi Ngrimbi which obtained a 140.45 hectare concession from the government.

The company's feldspar production rose from 11,173 tons in 1983 to 21,091 tons in 1985.

(5) Other raw materials

Other materials, besides the main basic materials mentioned above, such as pigments, first and other chemical ingredients must still be imported because they have not been produced in Indonesia.

3-5-3 Exports

(1) Trends in Exports

Most producers of kitchenwares and ornamental wares are still oriented mainly to the domestic market. Several companies explained that there are still many problems faced in entering the export market. They said prices, quality and design are still less competitive with similar products from other countries.

Another barrier to exports is the lack of knowledge about the international market preferences because local producers have not had regular contacts with buyers or importers overseas. Of the 12 companies, only 2 have made contacts with importers overseas. Hence, most producers are not well informed about the networks of distribution and market preferences overseas.

Most local producers therefore hesitate to promote exports and concentrate their sales on the domestic market.

Indonesian exports of various kinds of ceramic products in 1987 amounted only to 48,544 kilograms (kg), up from 35,274 kg in 1986 and 31,110 kg in 1985. The export value amounted to US$58,309 in 1987, up from US$29,708 in 1986.

Most of the exports in 1987 consisted of all kinds of plates of porcelain which accounted for 84.3% of the total.

(2) Exports by Country of Destination

Exports of kitchenwares and ornamental wares of earthenware, china and porcelain were made to Australia, Singapore, Saudi Arabia, Hong Kong, the United States and Malaysia. But the largest importers were Singapore, Saudi Arabia, Hong Kong and Malaysia. Exports of all kinds plates made of porcelain to Saudi Arabia in 1985 amounted to 27,600 kg valued at US$17,500. But in 1986, exports to Saudi Arabia stopped. The largest importers in 1986 were Hong Kong and Malaysia.

(3) Export Quality and Export Price

Most Indonesian domestic producers do not bother to fulfill the Standard Industri Indonesia (SII) quality standards because those standards have not been fully enforced by the industry ministry. Hence, producers who export part of their products usually meet

the quality standards as set or demanded by importers or buyers overseas. For example, PT Sango Ceramics, currently the largest single exporter, uses mostly JIS (Japan Industrial Standard) for its exports.

To enable it to meet JIS, PT Sango Ceramics operates Japan-made machinery and equipment and employs several Japanese technicians to supervise its quality control.

Other exporters, according to our field surveys, also usually apply the quality standards as demanded by their buyers overseas because their exports are based mostly on firm orders.

According to PT Sango Ceramics, its export prices usually are 25% to 30% lower than domestic prices even though the products designed for exports should have better quality than those sold on the domestic market.

3-5-4 Imports

(1) Trends in Import

Even though local production has actually been capable of satisfying the domestic demand, Indonesia still imports kitchenwares and ornamental wares. In fact, their imports have been much larger than exports.

Imports of kitchenwares and ornamental wares in 1983 totaled 647,403 kg valued at US$ 1.1 million, down to 595,564 kg worth US$ 739,000 in 1985 and rose to 1,802,753 kg valued at US$ 2.1 million in 1987.

Most of the imports consisted of other tablewares of porcelain (custom tariff No. 69.11.990) which in 1986 amounted to US$ 937,901. Other major imports consisted of statuettes and other ornaments of porcelain (custom tariff No. 69.13.100) which in 1986 amounted to US$ 599,976.

(2) Imports by Country of Origin

China, Japan and Taiwan were the largest suppliers of kitchenwares and ornamental wares to Indonesia. The three countries supplied 2,037 tons or 86.2% of Indonesia total imports in 1986. The value of their exports amounted to US$ 1.70 million or 75.8% of the total import value in 1986. Other suppliers included West Germany, Singapore, the United States, South Korea, Britain, France, Hong Kong.

3-5-5 Government Policy

(1) Industrial Promotion Policy

The Indonesian ceramic industry has been growing rapidly, as reflected by the steady increase in its production, even though the industry is still oriented largely to the domestic market.

The Indonesian government, however, wants to see the industry develop further to tap the export market because the local availability of most raw materials for ceramics theoretically provides the industry with a comparative advantage.

Based on Presidential Decree No. 15/1987 dated May 25, 1987 regarding Investment Priority Scale (DSP), the ceramic industry is still widely opened to domestic and foreign investors. The government promotes new investments in the following products:

- Plates of all kinds
- cups and saucers
- Trays
- Bowls
- Pots
- Tea set
- Coffee set
- Dinner set
- Spoon and ashtrays
- Other products

The decree stipulates that foreign investment projects in the ceramic industry shall be oriented largely to exports.

To promote investments in the ceramic industry (like other sectors accorded high priority), the government exempts import duty from machinery and equipment and other capital goods imported by domestic and foreign investment projects and other investment projects implemented outside the supervision of the Investment Coordinating Board (BKPM). Investors also can defer the payment of value added tax and sales tax on luxury goods.

The import duty relief and other fiscal incentives are, however, granted only a to export oriented investment ventures. Wholly or partially export-oriented ventures are defined as:

- Wholly export-oriented if companies export at least 65% of their total production.
- Partially export oriented if companies export less than 65% of their total production.

The decree stipulates that export oriented ventures shall have begun exports within three months after production start-up, and 24 months after production start-up the companies shall have realized their exports fully according to their targets (export plans).

To obtain, import duty relief, companies must submit applications to the finance ministry's Center for the Administration of Import Duty Relief and Drawback (P4BM). Applications for import duty relief will be processed within ten days and those for import duty drawback within 14 days.

· Export oriented foreign investment ventures are allowed to export their own products and the products of other companies.

(2) Export Promotion Policy

The government or companies have not been aggressive in promoting exports of ceramic products. Several producers did take part in international trade fairs under the coordination of the National Agency for Export Promotion (NAFEP), but their promotion efforts have not been so intensive.

Most producers make exports only at the orders from importers or buyers overseas. They are not aggressive in seeking buyers because they assume that the international market has been dominated by China, Japan, Europe and several other countries.

4. Cost Analysis

4-1 Production Cost Structure and Production Unit Cost in Malaysian Chinaware Manufacturing

4-1-1 Production Cost Structure

The production cost structure of chinaware would vary largely according to such diverse factors as the types of products, product quality, production volume, production facilities or production process. For the purpose of very rough analysis, the production cost structure of some Malaysian chinaware manufacturers was obtained from the field interview survey and compared with that of average Japanese chinaware manufacturers.

Table VI. 4-1: Chinaware Production Cost Structure Comparison

(Unit: %)

	Wholly-owned subsidiary operating in Malaysia		Local decorativeware manufacturer in Malaysia		Average chinaware manufacturer in Japan
	A	B	C	D	E
Raw materials	21.0	20.3	15.0	15.0	35.5
Labour	49.0	19.5	50.0	35.0	33.5
Fuel	8.0	4.2	15.0	10.0	4.8
Depreciation	5.0	22.1			3.3
Sales & general administration	12.0	25.0	20.0	40.0	20.4
Interest	5.0	9.0			2.5
Total	100.0	100.0	100.0	100.0	100.0

Source: Field interviews
"Production Unit Cost Index of Japanese Medium and Small-scale Industries"
Japan Medium and Small-scale Industry Agency

Generally, Malaysian manufacturers enjoy the benefit of cheap raw materials, while they suffer from high interest payments for outside borrowing. In spite of the availability of the cheap labour force, the labour cost ratio is not necessarily high in Malaysian manufacturers compared with the ratio in Japan. This is due to the difference of the product unit sales value and partly due to the difference in production volume.

4-1-2 Unit Production Cost

The unit costs of major items needed for the production of chinaware were investigated through field interviews, the results of which are briefly summarized as follows:

Initial Investments

Factory building construction ---------- M$500-800/$m^2$
(steel-frame structure, slate-roofed)
Kiln construction ---------- M$1.5 million/unit
(continuous kiln of 90m^2 fully equipped)

Operation costs

Factory worker wage
- General worker ---------- M$10-20/day
- Supervisor ---------- M$30/day
- Senior-technician ---------- M$75-150/day

Raw material
- Local clay ---------- M$5-10/ton
- Imported ball clay ---------- M$650-900/ton
- Feldspar, imported ---------- M$130-150/ton

4-2 Comparison of Net Production Costs of Chinaware in Malaysia and Japan

Comparison of the net costs between the two countries is not easily done for the following reasons.

1. The many varieties of chinaware products and large difference of types of products between the two countries make the comparison difficult.
2. Even the products using the same raw materials and produced in the same production process differ in their quality and prices.
3. Technique and brand image of long years which are difficult to reflect in the production costs result in the large difference in the sales prices in the two countries.

Despite the above difficulty, in order to roughly compare the difference in their production cost levels, a certain specified product with the following premises was assumed.

1. Product: Mugs
2. Type of product: Stoneware
3. Weight: 250g
4. Minimum size of order: 100,000 pcs./order
5. Mixed materials as principal raw materials would be imported from Japan.

The results of the comparison are shown in Table VI. 4-2

Table VI. 4-2 Comparison of Net Production Cost of Mugs

Premises:

Size of Orders: 100,000 pcs/order

Product Item: Stoneware

Raw Materials: Mixed materials imported from Japan

(Unit: J¥/piece, %)

	Japan			Malaysia	
Materials	J¥15	(12.5)	Materials	J¥18	(26.9)
Personnel	J¥50	(41.7)	Personnel	J¥15	(22.4)
Utilities	J¥15	(12.5)	Utilities	J¥12	(17.9)
Depreciation	J¥ 5	(4.2)	Depreciation	J¥5	(7.5)
Others	J¥10	(8.3)	Others	J¥5	(7.5)
Production cost	J¥95	(79.2)	Production cost	J¥55	(82.1)
Administration	J¥25	(20.8)	Administration	J¥12	(17.9)
Ex-factory	J¥120	(100.0)	Ex-factory	J¥67	(100.0)

Packages & transportation	J¥8
Ocean freight & Insurance	J¥10
CIF Japan	J¥85

Source: Field Interview

First, the Malaysian level of net production cost is approximately 58% of that in Japanese, (M$ 1.10/ea in Malaysia VS. M$1.90/ea in Japan)

Second, that of ex-factory cost which is net-production cost plus sales & administration cost is approximately 56% of the Japanese level (M$1.34/ea in Malaysia VS. M$2.4/ea in Japan).

Third, the CIF price level of the Malaysia product in case of exporting to Japan would be M$1.70/ea which is about 70% of Japanese production cost. The result of the comparison indicates that Malaysian products could be competitive enough, even utilizing principal materials imported from Japan if technology transfer from Japanese firms to Malaysian manufacturers should be complete.

The foreign exchange ration used in the cost analysis is as follows:

1 M$ = J¥50

1 US$ = J¥130

4-3 Feasibility Study on Construction of High-class Tableware Plant in Malaysia

4-3-1 General View

In order to evaluate the adaptability of Malaysia for an industrial site of the chinaware industry, a quite rough analysis of investment feasibility was conducted: on the assumption that a plant is to be newly constructed in Malaysia.

General outline of the plant

* Products: High class ceramic tableware
* Production volume: 4.25 million pcs./yr (fully capacity -1,200 ton/yr)
*Employees: Approx. 200
*Area of plant: 7,416m^2 (including office building)
*Initial investment: M$23.5 million

Major factors in assumption are as follows:

1. Economic project life: 20 years

2. Prices: Fixed price as of March, 1988

3. Investment incentives: Exemption from import tax for equipment and raw materials. Five (5) year exemption from corporate tax.

As indicated in the detailed analysis shown in the following paragraph, the Financial Internal Rate of Return during this project is about 8.5% which is almost the level of profitability.

At the relatively early stage of two years after the start of operation, ordinary profit would be attained as indicated hereunder.

The five year forecast after the start of operation is summarized in Table VI. 4-3.

Table VI. 4-3 Summarized Flow of Profit and Loss Forecast

(Unit: M$1,000)

	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.
Sales Value	8,640	12,960	14,400	14,400	14,400
Production Cost	7,253	9,136	9,764	9,764	9,764
(Materials)	(3,222)	(4,833)	(5,370)	(5,370)	(5,370)
(Labour)	976	(976)	(976)	(976)	(976)
Administration	645	836	899	899	899
Operating Profit	742	2,988	3,737	3,737	3,737
Interest	1,565	1,689	1,492	1,126	939
Ordinary Profit	-823	1,299	2,245	2,611	2,798

Source: Table VI. 4-9

4-3-2 Initial Investment Value

In order to evaluate the funds necessary for initial investment, the following premises were assumed.

1. The plant would be located in the Kampon Acheh Industrial complex in the state of Perak. Though not based on strict survey, the selection of this site was made just for the purpose of the assumption in cost calculation.
2. The factory and the stock house were assumed to be of simplified structure such as slate roofed or open air type, while the office or the laboratory building would be air-conditioned and steel frame blocked type.
3. Most of the major equipment and materials would be imported from Japan. Transportation cost was calculated as ocean freight from Nagoya port in Japan to Port Klang in Malaysia.

The results of the cost estimation related to the investment were shown in Table VI. 4-4, which can be summarized as follows.

1. Land	M$ 444,288
2. Construction	M$ 3,056,800
3. Machinery & equipment	M$ 15,863,320
4. Vehicle, stationery	M$ 220,000
5. Contingency (1+2+3+4) x 20%	M$ 3,916,882
Total	M$ 23,501,290

Meanwhile the annual depreciation cost for the investment is shown as follows:

1. Building	M$ 152,840
2. Machinery & equipment	M$ 1,586,332
3. Vehicle, stationery	M$ 44,000
Annual Costs (first 5 years)	M$ 1,783,172

Table VI. 4-4 Estimate of Initial Investment

(1) Initial Investment

a.	Land 19,200m^2 @ M$23.14/m^2	M$444,288
b.	Factory Construction	M$3,056,800
	Factory Stockhouse (slate roofed, open air type)	
	6,384m^2 @ M$350/m^2	5,234,400
	Office Building and Laboratory	
	1,032m^2 @ M$700/m^2	722,400
	Guarantee for Outside and Water Supply etc.	100,000
c.	Machinery and Equipment	M$15,863,320
	Imported Machinery (FOB)	12,474,360
	Transportation (Nagoya-Port Klang)	388,960
	Machinery Locally Procured	3,000,000
d.	Vehicle Stationery	M$220,000
	Two Trucks @ M$100,000/ea	200,000
	Stationery 1 set	20,000
e.	Contingency (a+b+c+d)x20%	M$3,916,882
	Total	M$23,501,290

(2) Depreciation

Building	20 years straightline depreciation	M$152,840
Machinery/equipment	10 years straightline depreciation	M$1,586,332
Vehicles Stationery	5 years straightline depreciation	M$44,000
Annual Depreciation (First 5 years)		M$1,783,172

Source: Study team calculation based on factory design shown in Fig. VI. 4-1 through Fig. VI. 4-3.

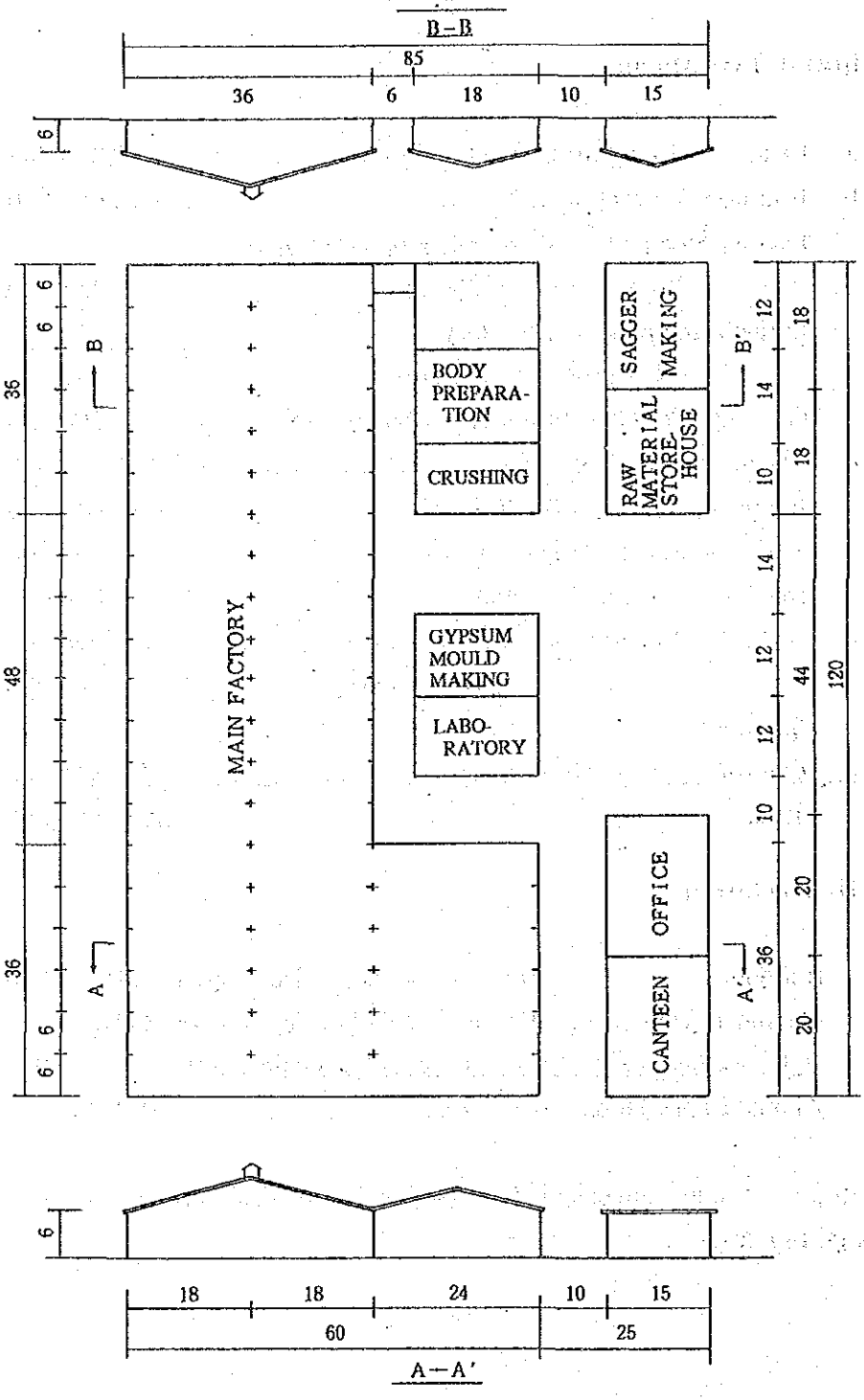


Fig. VI.4-1 Architectual Design for Chinaware Factory

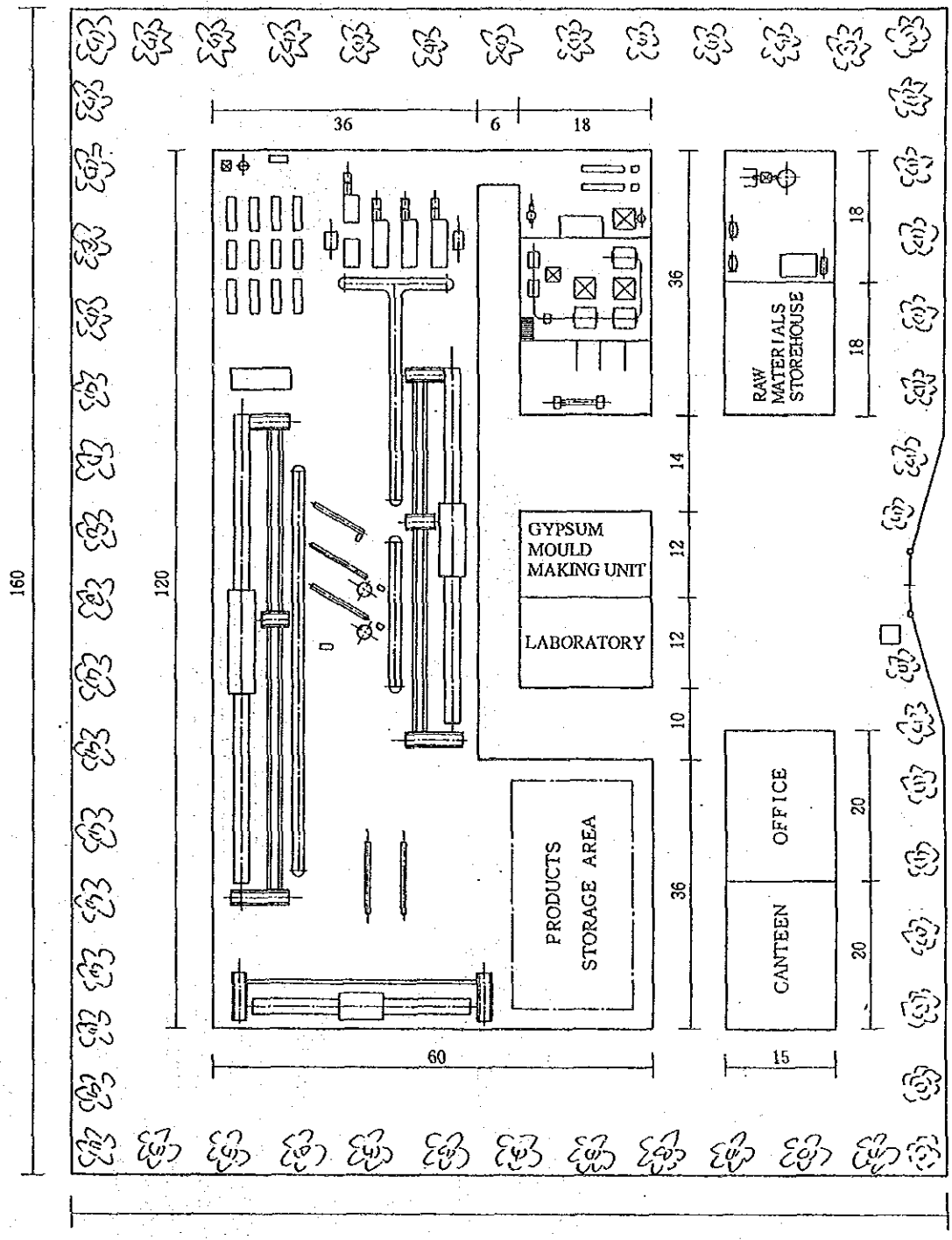
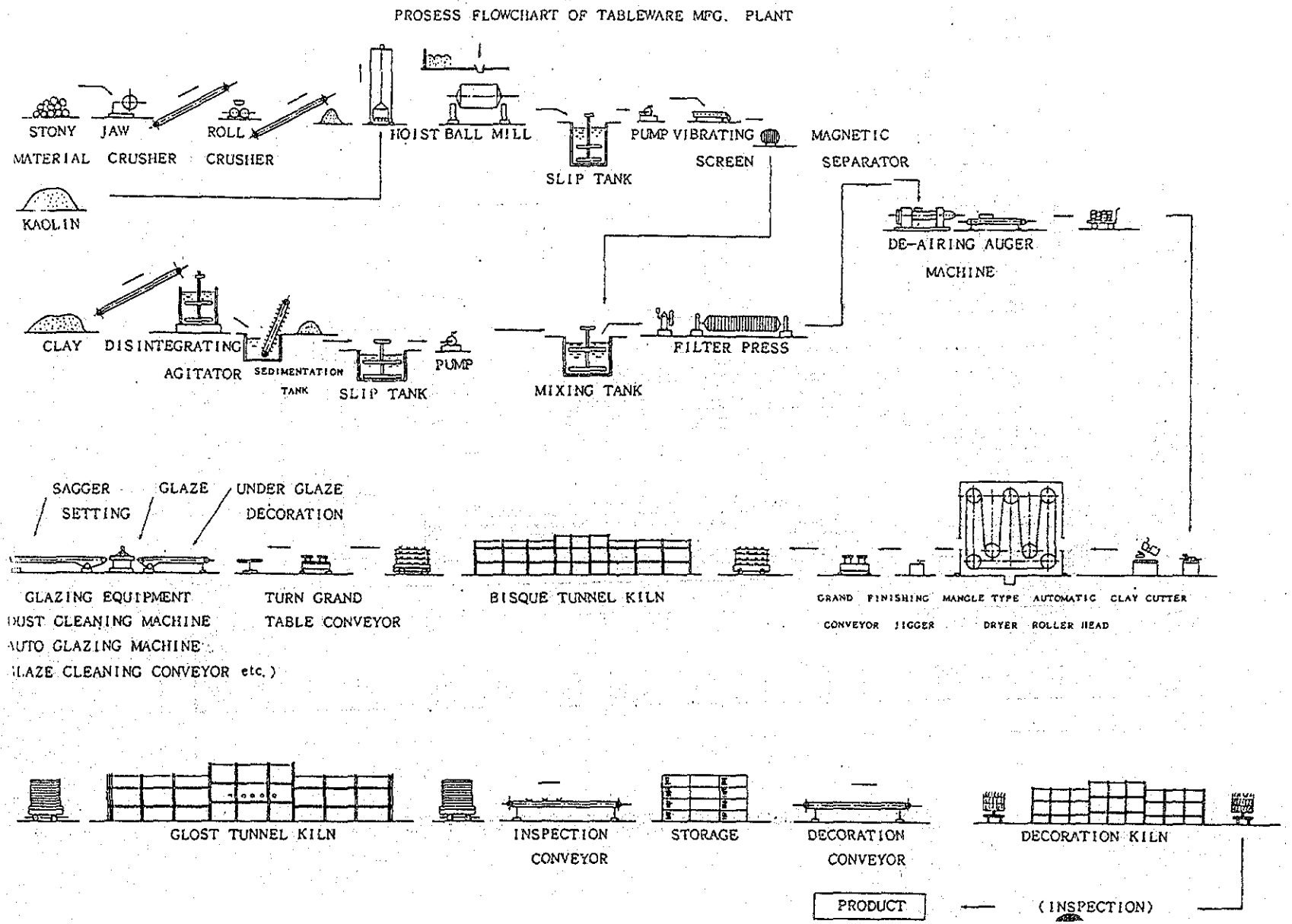


Fig. VI.4-2 Layout for Chinaware Factory (Conception)

Fig. VI.4-3 Production Process Flowchart for Chinaware Factory



4-3-3 Raw Materials and Utilities

All the raw materials except silica sand would be imported from Japan in consideration of the consistency of grade and quality in the products. Raw materials would be pre-mixed materials which are packed in bags would be pre-mixed materials which are packed in bags in the compressed and dehydrated state to be shipped from Nagoya port in Japan to Port Klang in Malaysia.

The result of cost estimation of raw materials is shown in Table VI. 4-5.

The total estimated cost of M$5,369,949 is composed of domestic cost of raw materials, M$11,830 and that of imported raw materials, M$5,358,119. The total cost is calculated as such to meet the full production capacity of 1,200 tons per annum.

In relation to utilities, heavy oil as fuel is assumed to be used for kilns, while electric power is assumed for other power requirements and lighting.

As shown in detail in Table VI. 4-5, an estimated annual cost of M$728,400 is calculated for utilities.

Table VI. 4-5 Estimated Annual Cost of Raw Materials and Utilities

(1) Raw Materials (Full operation)

	Annual Consumption Volume	Annual Raw Materials Cost
Imported Raw Materials		
Feldspar	775 tons	M$ 320,850
Plastic clay	500 tons	527,000
Talc	15 tons	39,390
Kaolin	523 tons	676,762
Saggar material	130 tons	249,600
Sodium silicate	35 tons	73,290
Plaster of paris	60 tons	240,840
Alumina	68 tons	156,808
Liquid gold	100 tons	1,068,000
Transfer paper	200 thousand	1,600,000
	Sub total	4,952,540
Transportation (Nagoya-Port Klang)		405,579
Total of Annual Imported Raw Materials		M$5,358,119

(2) Utility Costs

a. Fuel (heavy oil)	1,280	kl	@300/kl	384,000
b. Machine oil	2000	l	@ 3/1	6,000
c. Lubricating oil	150	kg	@16/kg	2,400
d. Electricity	1,600,000	kwh	@0.21/kwh	336,000
Annual Utility Costs				M$ 728,400

Source: Study team calculation

4-3-4 Programmes of Production and Sales

(1) Production Capacity

The kiln capacity would be a decisive factor in the production capacity of the chinaware factory. In this project, utilization of high quality continuous kilns which are in ordinary use in Japan is assumed because of the good performance in energy saving effect and consistent results of burning. The economical minimum volume of production for this type of kiln is about 1,200 tons per annum.

(2) Kinds of Products

In this project, production of high class ceramic products mainly consisting of dinner sets (81 pcs./set) and tea sets (21 pcs./set) is assumed. Annual production at full operation for each of the items is assumed as follows.

Plates	2,250 thousand pcs.	800 tons/yr
Large plates	(9-10")	
Medium plates	(7-8")	
Small plates	(4-8")	
Cups/Bowls	1,590 thousand pcs.	300 tons/yr
Coffee cups		
Tea cups		
Bowls		
Pots/Platters	144 thousand pcs.	100 tons/yr
Platters		
Coffee pots		
Tea pots		

(3) Unit Sales Prices

Unit sales price of the product is a very influential factor in judging the feasibility of a project. For reference in assuming the unit sales price, Japanese export unit sales prices were investigated, the result of which is shown in Table VI. 4-6.

Table VI. 4-6 Unit Export Sales Prices of Japanese Ceramic Tableware

		Export Volume	Export Value	Unit Sales Price
		(tons)	(FOB J¥1,000)	(J¥1,000/ton)
1985				
	Tea sets, coffee sets	10,980	8,796,472	808
	Other tableware over 32 sets	5,270	4,128,420	783
	Other tableware under 32 sets	34,070	27,838,040	817
	Total	50,230	40,762,932	812
1986				
	Tea sets, coffee sets	8,993	6,562,069	730
	Other tableware over 32 sets	4,358	2,760,445	633
	Other tableware under 32 sets	28,159	21,364,047	759
	Total	41,510	30,688,561	739
1987				
	Tea sets, coffee sets	7,373	5,699,917	773
	Other tableware over 32 sets	4,828	2,892,810	599
	Other tableware under 32 sets	26,650	19,509,815	732
	Total	38,351	28,102,542	723

Source: Japan Exports and Imports, Dec. 1985, 1986, 1987 MOF

The result of the investigation shows that the FOB unit export price for Japanese ceramic tableware is J¥758,000/ton (about M$15,000/ton). Based on the result, unit sales price in this project was assumed as M$12,000/ton, that is, 20 percent lower than the Japanese unit export price.

(4) Sales Forecast

Sales forecast was made taking into consideration the production capacity, the unit sales price and the operation rate at the start. The flow forecast of sales is shown in Table VI. 4-7.

Table VI. 4-7 Forecast of Sales Value

	1st yr.	2nd yr.	3rd yr. and after
Production capacity (tons/yr)	1,200	1,200	1,200
Operation rate (%)	60	90	100
Production volume (tons/yr.)	720	1,080	1,200
Sales value (thousand M$)	8,640	12,960	14,400

4-3-5 Personnel Costs

According to each job category, the number of personnel necessary for the operation of this project was investigated. The result indicates the necessity of a total of 200 persons, composed of 20 persons for administration and 180 persons for manufacturing. Average personnel costs in each job category are assumed based on the result of field interviews or various statistics materials available in Malaysia. In this calculation of personnel cost, not only the basic salary but also various fringe benefits and bonuses were included to assume an aggregate unit cost of personnel. Thus, as shown in Table VI. 4-8, annual cost of personnel in this project was assumed as M$1,241,400.

Table VI. 4-8 Annual Personnel Costs

	Number	Unit monthly cost (M$)	Monthly cost (M$)	Annual cost (M$)
Manufacturing				
Factory manager	1	2,800	M$2,800	M$33,600
Engineers	2	1,500	M$3,000	M$36,000
Assistant Engineers	2	1,000	M$2,000	M$24,000
Foremen	12	650	M$7,800	M$93,600
Skilled workers	100	500	M$50,000	M$600,000
Unskilled workers	63	250	M$15,750	M$189,000
Sub total	180	--	M$81,350	M$976,200
Administration				
President	1	3,500	M$3,500	M$42,000
Administration manager	1	2,000	M$2,000	M$24,000
Accounting manager	1	2,000	M$2,000	M$24,000
Sales manager	1	2,000	M$2,000	M$24,000
Clerical workers	4	1,500	M$6,000	M$72,000
Businessmen	2	1,500	M$3,000	M$36,000
Typists	1	500	M$500	M$6,000
General servants	2	250	M$500	M$6,000
Drivers	2	550	M$1,100	M$13,200
Others	5	300	M$1,500	M$18,000
Sub total	20	-	M$22,100	M$265,200
Grand Total			M$103,450	M$1,241,400 (J¥621 million)

4-3-6 Fund Recruitment Programme

The initial investment value necessary in this project was assumed to be procured from paid-up capital (1/3), long-term borrowing (2/3) and short-term borrowing which would cover other working costs.

Fund Recruitment Programme

Paid-up capital	-	M$ 7,850,000
Long-term borrowing	-	M$ 15,650,000
Short-term borrowing	-	working costs

Procurement conditions for borrowing were assumed as follows:

Long-term borrowing -
10 years average reimbursement interest 10.0%
Short-term borrowing -
within one year reimbursement interest 10.0%

4-3-7 Projection of Long Term Profit and Loss

Projection of long term profit and loss in this project based on the estimated sales volume and other various costs was assumed as shown in Table VI. 4-9. The various costs not specified in the production cost were assumed to be 6.3% of the production unit cost index of Japanese industries. The other costs in the sales administration cost were assumed to be 3.6% of the production unit cost index of Japanese industries.

The structure of production cost of Japanese chinaware (tableware) manufacturers is shown in Table VI. 4-10 which was used as the basis of the calculation of other miscellaneous costs.

Long term fund recruitment flow is projected as shown in Table VI. 4-11 which is based on the assumed conditions of fund procurement and borrowing in the Funds Recruitment Programme. The value of payment of interest based on the long term fund recruitment flow (Table VI. 4-11) is fed back as the value of non-business expenses in the long-term profit and loss projection (Table VI. 4-9).

Table VI. 4-9 Long Term Flow of Profit and Loss Projection

	1st yr.	%	2nd yr.	%	3rd yr	%	4th yr.	%	5th yr.	%
Sales Value	8,640	100.0	12,960	100.0	14,400	100.0	14,400	100.0	14,400	100.0
PRODUCTION COST										
Materials	3,222	37.3	4,833	37.3	5,370	37.3	5,370	37.3	5,370	37.3
Labours	976	11.3	976	7.5	976	6.8	976	6.8	976	6.8
Utilities	728	8.4	728	5.6	728	5.1	728	5.1	728	5.1
Depreciation	1,783	20.6	1,783	13.8	1,783	12.4	1,783	12.4	1,783	12.4
Other expenses (1)	544	6.3	816	6.3	907	6.3	907	6.3	907	6.3
Sub-total	7,253	83.9	9,136	70.5	9,764	67.8	9,764	67.8	9,764	67.8
SALES & GENERAL ADMINISTRATION										
Personnel	265	3.1	265	2.0	265	1.8	265	1.8	265	1.8
Packages & Transportation	78	0.9	117	0.9	130	0.9	130	0.9	130	0.9
Other expenses (3)	302	3.6	454	3.5	504	3.5	504	3.5	504	3.5
Sub-total	645	7.5	836	6.4	899	6.2	899	6.2	899	6.2
Operational Profits	745	8.6	2,988	23.1	3,737	26.0	3,737	2.6	3,737	2.6
Non-business expenses (4)	1,565	18.1	1,689	13.0	1,492	10.4	1,126	7.8	939	6.5
Ordinary Profit	-823	-9.5	1,299	10.0	2,245	15.4	2,611	18.1	2,798	19.4

(1) 6.3 % of average sales cost in Japanese chinaware industry.
(2) 0.9 % of average sales cost in Japanese chinaware industry.
(3) 3.5 % of average sales cost in Japanese chinaware industry.
(4) Total of interest shown in Table VI 4-11 (Cash Flow Estimate).

Table VI. 4-10 Production Cost Structure of Japanese Chinaware Industry

	Average Production Cost [1]	
	(J¥1,000)	Composition (%)
Average Product Sales [2]	756,809	100.0
Production Costs		
Materials	251,169	33.2
Labour-outside	237,444	31.4
Depreciation	19,658	2.6
Utilities	33,821	4.5
Rents	4,579	0.6
Others	47,872	6.3
Sub total	594,543	78.6
Sales-General Administration		
Personnel	52,242	6.9
Packaging-transportation	7,156	0.9
Interest payable	18,056	2.4
Depreciation	3,377	0.4
Taxes	5,834	0.8
Others	26,718	3.5
Sub total	113,383	14.9
Sales Profit	48,883	6.5

[1] Average of 12 good Companies

[2] Average sales value - buying Cost
(J¥783,017 thousand) - (J¥26,208 thousand)

Source: "Production Unit Cost Index of Japanese Medium and Small-scale Industries", Japan Medium and Small-scale Industry Agency

Table VI. 4-11 Cash Flow Estimates

(Unit: M$1,000)

	Before operation	1st yr.	2nd yr.	3rd yr	4th yr.	5th yr.
Carry-over from Previous Year	0	0	35	72	75	2,604
Capital Payment	7,850	0	0	0	0	0
Sales Revenue	0	8,640	12,960	14,400	14,400	14,400
Cost of Products	0	7,253	9,136	9,764	9,764	9,764
Administration	0	645	836	899	899	899
Total Costs	0	7,898	9,972	10,663	10,663	10,663
Operating Balance	0	742	2,988	3,737	3,737	3,737
Working Capital	0	0	2,160	3,240	3,600	3,600
Working Capital for this yr.	0	2,160	3,240	3,600	3,600	3,600
Working Capital Balance	0	-2,160	-1,080	-360	0	0
Investment	0	1,783	1,783	1,783	1,783	1,783
Machinery and Equipment	23,500	0	0	0	0	0
Investment Balance	-23,500	1,783	1,783	1,783	1,783	1,783
Long-term Borrowing	15,650	0	0	0	0	0
Principal	0	1,565	1,565	1,565	1,565	1,565
Interest	0	1,565	1,409	1,252	1,096	939
(Amount Borrowed)	(15,650)	(14,085)	(12,520)	(10,955)	(9,390)	(7,825)
Balance	15,650	-3,130	-2,974	-2,817	2,661	-2,504
Short-term Borrowing	0	2,800	2,400	300	0	0
Principal	0	0	2,800	2,400	300	0
Interest	0	0	280	240	30	0
(Amount Borrowed)	0	(2,800)	(2,400)	(300)	(0)	(0)
Balance	0	2,800	-680	-2,340	-330	0
Financing Balance	15,650	-330	-3,654	-5,157	-2,991	-2,504
Total Balance	0	35	37	3	2,529	3,016
Carry-over for Next Year	0	35	72	75	2,604	5,620

4-3-8 Evaluation of the Results of the Feasibility Study

Financial Internal Rate of Return (FIRR) is calculated based on the long-term profit and loss projection through the period of this project. FIRR is the discount rate at which the net present value of the investment and the net present value of the return would balance. The result in detail of FIRR calculation is shown in Table VI. 4-12 in which FIRR is calculated as 8.49%, not such a high rate but a rate which makes this project tolerably viable.

In order to increase the rate, the first measure to be taken is to raise the unit sales price by improvement of the product quality. On assumption that the unit sales price could be raised 10% more the FIRR of this project would be about 12%.

As the second measure to raise the FIRR, the change of the raw materials from domestic to imported ones would be recommended. If clay and kalion, for example, were replaced from imported to domestic, cost savings of approximately M$1,000,00 per annum could be achieved.

This cost saving would have nearly the same effect as the 10% raise of the unit sales price resulting in a rate of 12% in FIRR.

Table VI. 4-12 Projection of Cash Flow and FIRR

(Unit: M$1,000)

Year	Ordinary profit	Depreciation	Corporate Tax	Profit after tax, before depreciation	Investment	Cash flow
0	-	-	-	-	23,501	-23,501
1	742	724	-	1,470	-	1,470
2	2,988	728	-	3,716	-	3,716
3	3,737	728	-	4,465	-	4,465
4	3,737	728	-	4,465	-	4,465
6	3,737	728	1,329	3,316	220	2,916
7	3,737	728	1,400	3,065	-	3,065
8	3,737	728	1,470	2,995	-	2,995
9	3,737	728	1,541	2,924	-	2,924
10	3,737	728	1,611	2,854	-	2,854
11	3,737	728	1,682	2,783	16,083	-13,300
12	3,737	728	1,682	2,783	-	2,783
13	3,737	728	1,682	2,783	-	2,783
14	3,737	728	1,682	2,783	-	2,783
15	3,737	728	1,682	2,783	-	2,783
16	3,737	728	1,682	2,783	220	2,563
17	3,737	728	1,682	2,783	-	2,783
18	3,737	728	1,682	2,783	-	2,783
19	3,737	728	1,682	2,783	-	2,783
20	3,737	728	1,682	2,783	-	2,783

FIRR = 8.49%

5. Measures for the Development of Malaysian Chinaware Industry

5-1 Specific Problems at Present

Specific problems which Malaysia manufacturers are facing up at present were reviewed as premises in planning of measures to develop Malaysia chinaware industry. The result could be summarized as follows:

(1) Industrial Structure

The major Malaysian chinaware manufacturers of raw material supplier groups are in separate enclaves, which makes the balanced growth of the ceramic industry difficult. For one, there is a group that exports 100 percent of their products overseas while depending wholly on imported raw materials, production technology, design or on the marketing capability of their parent companies overseas. For another, there are relatively large number of local manufacturers that produce traditional types of decorativeware as souvenirs. They mainly depend on the traditional production technology and raw materials locally available.

(2) Institution

Malaysia lacks a public institute or organization to support its ceramic industry group, and almost no assistance in technology, market information or engineering training has been done. In addition, a relatively low import tax on ceramic products and a high demand for chinaware products not produced in Malaysia combine to force the very large variety of imported chinaware products.

(3) Raw Materials

Malaysia abounds with major mineral materials essentially used for chinaware production such as Kaolin or plastic clay. Unfortunately, however, these raw materials are not fully utilized for the production of high value added products. This is partly because of the low quality of mineral resources presently produced in Malaysia but mainly because of the lack of investigation for better utilization of materials and the lack of suppliers who could supply a consistent grade of various kinds of clay material.

Although there are two major kaolin processing plants in Ipoh, their products are mainly for paper and other industrial uses and not specifically for ceramic industries.

(4) Management and Marketing

Small domestic market size is one of the major problems for chinaware production as well as for most other industrial production in Malaysia. In addition to the smallness of the total market size, the diversified demand of consumers from top-quality products to low-end products make the production volume of each product item even smaller. This limited market size is largely preventing the autonomous growth of chinaware manufacturing in Malaysia. Many local companies are small family owned firms except those of foreign capital companies. They are managed without modernized management methods and facilities for quality control. In fact, they often lack even the concept of quality control.

Except for some foreign subsidiaries, most Malaysian chinaware manufacturers lack the capability to develop their own design. They mostly follows the traditional designs or imitate the designs of foreign products. As long as they stay in this stage, it is rather difficult for them to achieve enough competitiveness in the export market. In sales activities, they take mainly the most primitive traditional sales method, selling direct to consumers from their own shops adjacent to their plants. Consequently, many of them lack in experience or know-how of exporting procedures.

As the ceramic industry in Malaysia belongs to the relatively capital-intensive category, the modernization of facilities requires considerable investment funds. However, because of the smallness of most of the chinaware manufacturers, Malaysian financial organizations do not show much interest in the financial support for their equipment investment. In addition to this, there is another problem of underlying assets being too weak to borrow necessary funds from financial sources.

(5) Production Technology

Chinaware manufacturing is an industry in which continuous product development efforts are needed in order to produce the highest quality products making best use of locally available raw materials. However, most Malaysian chinaware manufacturers are small in scale. Most of them rely either on directly imported production technology or on traditional production methods, and have not enough capability to develop their own technology best fit for their condition.

In production process and quality control, a great gap in technical level can be pointed out between local manufacturers depending on traditional methods and foreign subsidiaries who are export oriented.

Improvement in technology and capability in each level of engineers and workers in chinaware manufacturers in Malaysia is an essential matter. Unfortunately however, in the Malaysian ceramic industry, there can be found almost no training facility, either private nor public, capable to train engineers or workers. The present situation is that they rely exclusively on their own experience attained through on-the-job training at their factories.

5-2 Measures to Promote Malaysian Chinaware Industry

Some kinds of measures considered to solve the specific problems which have been reviewed in the preceding paragraph are as follows:

(1) Problems in the Industrial Structure

In order to solve the problems of ceramic manufacturers located in separate enclaves and lacking mutual relationships, a measure such as establishment of an industrial association could be recommended.

Although there is a ceramic association called "The Malaysian Ceramic Industry Group", it is not a formal organization, and do not necessarily cover all of the tableware or ornament manufacturers.

An associated union such as recommended here would have to meet the requirement of activities such as mutual technical exchange or collection in common of market information.

Also, it is recommended that the possibility of construction of a ceramic industrial complex mainly constituted of materials suppliers, testing and research institutes, be examined.

(2) Institutional Problems

In Malaysia, the establishment of a governmental policy of a supporting system in institutional approach for the development of the chinaware industry is largely belated.

In particular, the establishment of testing and research institutes or training centers is urgently required. A preliminary survey is necessary for the start of production of items which are not produced at present domestically. For this purpose, it is also necessary to promote and activate the inducement of investment of foreign companies who have know-how in production and marketing.

(3) Problems of Raw Materials

In order to produce high quality clay and kaolin, essential materials for high quality chinaware, a better method of exploration and mapping operation for these materials is needed. The development of techniques in material mixing and refining for effective utilization of domestic raw materials is also needed. A feasibility study for the establishment of a ceramic raw material suppliers group or institute which is capable to supply consistent quality to ceramic manufacturers, and the study of the possibility of common utilization of raw materials among manufacturers would be recommended.

(4) Improvement of Management and Marketing

For the modernization or the enforced external competitiveness of Malaysian chinaware industry, management training is necessary. To meet that requirement, facilities and programmes of training should be established.

In order to develop the small-sized Malaysian chinaware manufacturers into export-oriented companies, it is essential to provide them with governmental support in the fields of information of overseas markets, overseas marketing, training of in export procedures and more effective implementation of the export financing system. For the financial needs for capital investment to modernize their major facilities, some kinds of supporting measures which make the funds available on soft-terms would have to be established because of the difficulty of fund recruitment, which most Malaysian manufacturers seem to be faced with.

(5) Improvement of Manufacturing Technology

In Malaysia, except for foreign subsidiaries, there are many small companies which cannot compete in the field of technology with foreign manufacturers.

First of all, government supports are needed in the field of ceramic concerned testing and research institutes or training facilities where comprehensive activities in raw material mixing, technique of burning, inspection of product, quality control or design development would be expected. Promotion of financial and technical cooperation with foreign companies with top quality production know-how would also be needed. Meanwhile, efforts by the private sector would also be necessary for the improvement of technology through technical exchange and mutual cooperation among themselves.

VII. GLASSWARE

VII. GLASSWARE

1. Overview of the Industry

1-1 Glassware Production in Malaysia

There are only four manufacturers in Malaysia which are presently producing glass products from mineral raw materials. Among them, one is a sheet glass manufacturer and the other three are glass container manufacturers. A small volume of glass tableware is also produced by the glass container manufacturers.

From the results of the field interview survey, the total annual production volume of glassware (excluding sheet glass) is estimated at around 112.8 thousand tons (metric tons) in 1987, of which about 33.0 thousand tons are exported.

Glass Containers

At present there are the following three local manufacturers which are producing glass bottles of various sizes:

- Malaya Glass Bhd.
- Kuala Lumpur Glass Manufactures Co. Sdn. Bhd.
- Jg Containers Sdn. Bhd.

With total production capacity of 415 tons per day, they produce glass bottles used for soft drinks, breweries or processed foods. Bottles are supplied on a contractual basis in flint (colorless), amber (dark brown) or green color. All the domestic requirements of these glass bottles are presently met by the above three local manufacturers with imports supplementing a small volume of the requirement for sizes not produced locally.

Glass tableware

Their are no manufacturers exclusively producing glass tableware in Malaysia. The three local manufacturers of glass containers are, however,producing a small volume of glass tableware. The production volume of their glass tableware production in 1987 is estimated at around 2,750 tons.

Other glass products

Other glass products except for containers and tableware in Malaysia are not produced from raw mineral resources but are processed from semi-finished glass products. They are:

Optical glass: A joint venture between Malaysia and a German firm is producing optical glass in Malaysia and exporting 100% of their products abroad. Presently, their activity is confined to grinding and polishing imported blanks.

Pharmaceutical glass: The same firm above mentioned produces small sizes of glass containers for pharmaceutical use making use of imported glass tubes.

Chemistry, general laboratory glassware: Such glassware as flasks or measurement cylinders is produced by the same firm mentioned above. The work in Malaysia is confined only to such finishing work as scale-making on imported semi-finished products.

Electrical glassware: There are three firms currently producing incandescent and fluorescent lamps in Malaysia, but most of the raw materials including the glass tubes and bulbs are imported.

Mirrors: A subsidiary firm of the domestic sheet glass manufacturer started the production of high-standard mirrors in 1987 making use of domestically produced float glass. 80% of this output is exported mainly to the U.S.

1-2 Export and Import

Malaysia was still a net importer of glassware in 1987. The trade imbalance in glassware has been improved considerably due to the rapid increase of exports in recent years.

The total export value of glassware in 1987 was M33,9 million showing a rapid average annual increase rate of 17.6% during 1983-87. The major export item was glass containers occupying up to 84% of the total export. Major export markets were Singapore and Hong Kong.

Table VII. 1-1 Export Flow of Glassware in Malaysia

(Unit: M$1,000)

	1983	1984	1985	1985	1987
Glass containers	12,552	10,225	22,357	24,854	25,568
Glassware for office/house use	2,504	2,280	2,086	1,269	1,366
Laboratory/hygienic/ Pharmaceutical glassware	2,632	3,337	5,241	3,287	4,658
Decorative glassware, blinds and beads	7	27	75	3	9
Others	0	1	272	35	292
TOTAL	17,695	15,870	30,004	29,448	33,892

Source: Malaysian Annual Statistics of External Trade 1983-1987

The total import value of glassware in 1987 was M$39.2 million. The major import item was glassware for office and household use, occupying about 65% of the total import.

Table VII. 1-2 Import Flow of Glassware in Malaysia

(Unit: M$1,000)

	1983	1984	1985	1986	1987
Glass containers	4,612	2,857	3,604	1,730	5,102
Glassware for office/house use	32,328	26,781	33,802	29,179	25,253
Laboratory/hygienic/ pharmaceutical glassware	3,623	4,414	4,890	4,639	4,298
Decorative glassware, blinds and beads	1,532	450	867	430	718
Others	100	59	64	92	3,874
TOTAL	42,195	34,562	43,257	36,070	39,246

Source: Malaysian Annual Statistics of External Trade 1983-1987

1-3 Supply and Demand

Glass Containers

The total market size of glass containers in Malaysia (at manufacturers and importers' sales value) is estimated at around MS57,0 million in 1987. Compared with the production capacity of the three domestic manufacturers, the market size is still small.

Table VII. 1-3 Estimated market size of Glass Containers in 1987.

(Unit: M$ Million)		
Domestic Production	76.0	a)
Imports	7.4	b)
Export	27.5	c)
Size Estimated	55.9	

a) Estimate based on the field interview survey

b) Estimate based on Trade Statistics, 30% of import duty and 15% of importer's margin are taken into consideration

c) Estimate based on Trade Statistics

The glass container market is in an oversupply condition not only in Malaysia but also in Asian nations as a whole and the competition in the major export markets is very severe.

Glass Tableware

The market size of glass tableware in Malaysia is estimated at around M$43.5 million. Most of the market demand is presently fulfilled by imported products. The locally produced products are limited items of rather low-end products. They are all produced by glass container manufacturers.

Table VII. 1-4 Estimated Market Size of Glass Tableware in 1987

(Unit: M$ Million)		
Domestic Production	1.8	a)
Imports	41.7	b)
Market Size Estimated	43.5	

a) Estimate based on the field interview survey

b) Estimate based on Trade Statistics. A 50% of import duty and a 15% of import's margin are added.

A plan to start production of glass tableware in Johore from September 1988 has been announced.

Other Glass Products

All of the other glass products are processed in Malaysia making use of semi-finished glass products. Except for electric lamps, most of the products thus finished in Malaysia are exported.

2. Present State of Production

2-1 Production Process and Specifications

Because the glassware industry is a highly capital intensive industry, there exist a small number of world-widely known glassware processing machine manufacturers. By them the production process is mostly standardized internationally. All of the three local glassware manufacturers in Malaysia are also following this standardized production process. That is; raw material selection --> purchase and storage --> batch preparation --> melting --> forming --> annealing --> single line inspection --> casing or packaging.

As for the computer control system, one of the firms has already installed 3 sets of control computers of forming machines which were very recently developed. Another firm is also planning to introduce a new computer control system. From the cost advantage, however, some manual operation processes are left in all of the firms. Along with the very modernized equipment, models of machines which are already obsolete are still in use.

2-2 Technical Level

Glass containers: Each of these local manufacturers of glass containers has a continuous technical tie-up with one of the world's leading glassware manufacturers, and each of them has sufficiently high level of technology. Taking the seed counts, for example, the average standard in Japan is said to be around 20 pcs/ounce. In one company in Malaysia seed counts of about 5pcs/ounce are reported, while in another, 50pcs/ounce. In general, however, all of the domestically produced products are well accepted in the local market.

Glass tableware: At present, there are no exclusive manufacturer of tableware in Malaysia. One of the glass container manufacturers produces glass tableware making use of a 12-head press-machine. The production capacity of the press-machine is around 7-8 tons per day. Other glass container manufacturers are producing tableware by the same IS machines which are used for bottle forming. Because of the machine constraint the production items are limited to such products as tumblers, jugs or cups. Because all of these firms produce tableware from the same melted glass used for glass bottles, the product quality for glass tableware is not high.

2-3 Product Development

As for the production of glass containers, all of the local firms believe that this product quality level is mostly satisfactory. Further, they are all in a condition such that all of the modern production technologies are obtainable mainly from their technical tie-up partners. A relatively recent new product development was one-way bottles. At present, however, most of the firms have already acquired the production technology for one-way bottles.

Although the quality level of glass tableware is still inferior it is considered to be not because of their technology level, but mainly of their passive attitude toward the production of tableware.

2-4 Sales Strategies and Business Administration

From the nature of their products, all of the local glass container manufacturers sell their products directly to industry users as soft drink manufacturers, breweries or food processing firms. They also export a considerable share of their products. But the major market is mostly confined to Singapore. Exports are made directly by the manufacturers.

Due to very severe competition both in domestic and in export markets, the financial achievement of local manufacturers is not necessarily good. Except for one firm which has a relatively strong sales route to their parent companies, other firms recorded financial losses continuously for the past 4-5 years. The major factors which induced these unsatisfactory financial achievements are reported as follows:

1) Due to the very small domestic market size, the production volume per order is small, which requires frequent job changes and reduce productivity; and
2) In order to compete in the very competitive markets, additional capital investments are often required, the financial burden for which is very heavy.

2-5 Relationship with Periphery Industries

Except for some minor points, no big problem was raised from any glass container manufacturer for their relationship with periphery industries. Major raw materials are locally available. Although some materials as soda-ash or lubricant oil are imported, there are no problems with their supply.

The major problems are as follows:

1. The expansion speed of domestic bottle demand is unsatisfactory.
2. The distribution channel for the domestic tableware market is more complicated compared with that for glass containers.
3. In the past, the trade imbalance of container cargo between Malaysia and Hong Kong created a problem for regular shipping.

2-6 Raw Materials

2-6-1 General

For the production of glassware, a variety of mineral resources are used. Among them, the most important mineral material is silica sand, which abound in Malaysia. Beside silica, lime-stone and dolomite are also locally available. The rest of raw materials are mostly imported, of which soda ash is the largest item. Other raw materials are imported in small quantities.

2-6-2 Silica Sand

Silica sand deposits which have a high silica and low iron content are found in abundant quantities in Malaysia. Such deposits are found around the coast of Trengganu (districts of Jambu Bangkok, Dungun and Marang), the east coast of Johore from Mersing to Pengerang, Sarawak (Bintulu, Roban) and Perak. In addition, there are large deposits of mining sand in the ex-mining areas, particularly in Perak and Selangor.

Deposit at Trengganu: The biggest known reserves of silica sand in Peninsular Malaysia exist in the state of Trengganu. These deposits are as yet untapped. According to the chemical analysis results conducted by the Geological Survey department, the grain size distribution and chemical composition of the silica sand in Trengganu are very consistent. With the low Fe_2O_3, content ranging from 0.02-0.05%, the quality of silica sand is judged to be satisfactory for the production of various kinds of glass products such as flint glass bottles, or tableware.

Table VII. 2-1 Major Chemical Composition of Silica Sand in Trengganu

(Unit: %)

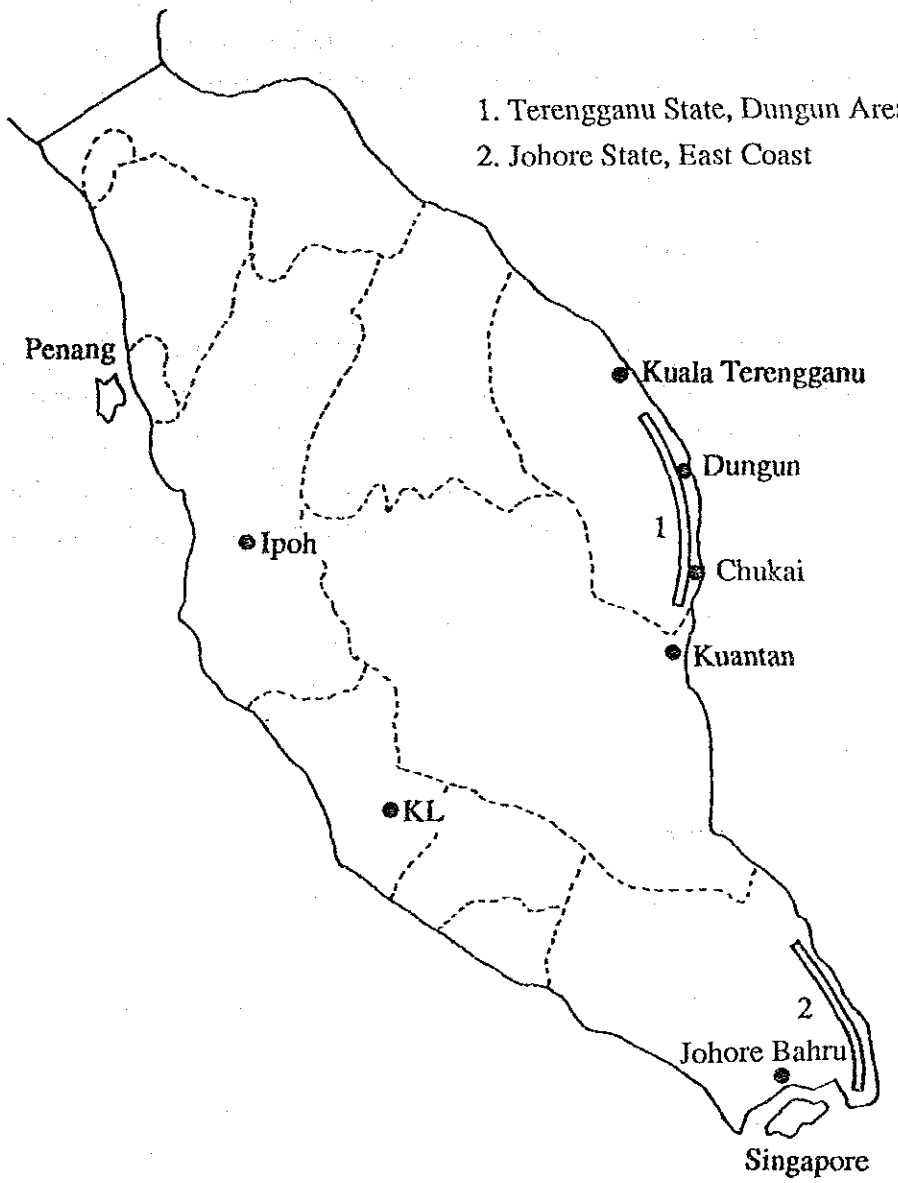
(Kampong Rantau Abang Area)	
SiO_2	98.99 - 99.77
Fe_2O_3	0.03 - 0.02
(Bukit Senyamok Area)	
SiO_2	99.5 - 99.30
Fe_2O_3	0.037 - 0.047
(Bukit Rantau)	
SiO_2	99.30 - 99.50
Fe_2O_3	0.025 - 0.029

Source: Geological Survey Department

The total volume of silica sand reserves in Trengganu is very roughly estimated at 1.0-3.0 million tons. This silica sand exists in a relatively a long and narrow area along the seas coast. The thickness of the sand layer is only 0.5-2.9m. Because of this layer state of the silica sand and the inconvenient location for transport, the export of silica sand in Trengganu as unprocessed mineral raw material would be difficult.

Deposit in Johore: In the south-eastern region of Johore exists a large and worked area of silica sand deposits. It covers an area of approximately 10,000 acres and is currently worked on a joint venture basis by the Johore State Economic Development Corporation. According to the investigation results conducted by the Geological Survey Department, the volume of silica sand reserves in Kuala Jemaluang is estimated at around 0.3 million tons and that in Tanjong Penawar at around 0.1 million tons. The Fe_2O_3 content varies between 0.1-0.7%. Because of this wide difference in iron content, the sand from Tanjong Penawar could be used for a wide variety of glass products including both flint glass containers and glassware but that from Kuala Jemaluang could be used only for a limited use such as colored bottles.

Fig. VII 2-1 Locality Map of Silica Sand Deposit in Peninsular Malaysia



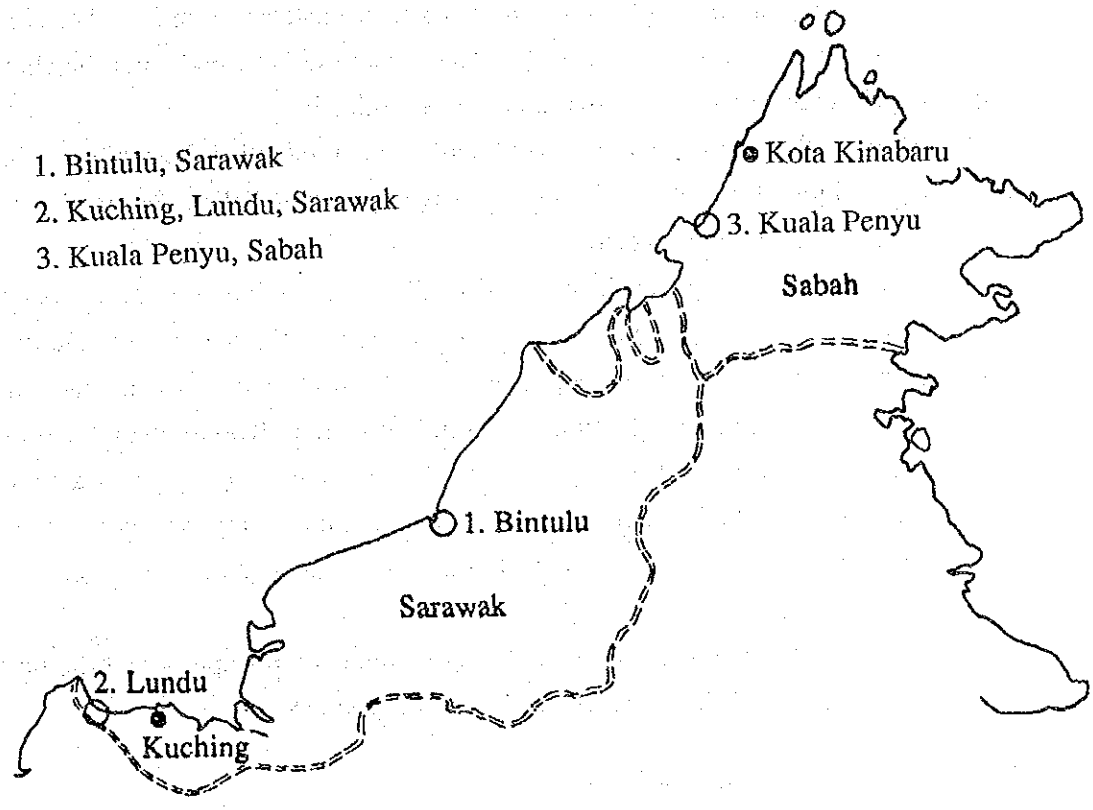
Deposits in Sarawak: Deposits of silica sand suitable for glass manufacture are located north of Bintulu, near Sematan, Lundu, Santubong, Roban and in the Baram Valley.

The most important deposit is located near Kidurong, Bintulu where a total reserve of 3 million tonnes of excellent quality silica sand is available. A joint venture company among the Bintulu Development Authority (BDA) and local manufacturers is now exploiting silica sand and exports 100% of these products to Japan after refining. Product quality is reported to be very high with the SiO_2 content 99.3-99.6% and the Fe_2O_3 content 0.004-0.017%.

2-6-3 Limestone and Dolomite

In Peninsular Malaysia, major limestone occurrences are in the west coast, especially in the state of Perak and Batu Caves in Selangor. The bulk of limestone production is being sourced by the construction, cement and glass industries, with the remainder being shared by the iron and steel industry and the chemical and allied industries. For the glass industry, high purity deposits of limestone and dolomite are readily available.

Fig VII 2-2 Locality Map of Silica Sand Deposit in East Malaysia



3. World Market Trends

3-1 International Glassware Market

In this chapter, the world glassware market size and structure have been reviewed from recent export and import statistics. The recent market trends and the changes of major suppliers and consumption markets were examined.

Along with the review of the world market, the production capacities of glassware in countries neighbouring Malaysia were investigated, in which the large supply capability of Indonesia was particularly noted.

As for Japan, which has the capability of produce high quality products but faces the big problem of sudden yen revaluation, the current industry situation and the major problems that they presently face were reviewed. One of the countries on which Malaysia manufacturers should give high attention would be Korea. Korean manufacturers have high technology to produce lead crystal glassware and aggressively penetrate the world market. Those kinds of measures that the Korean manufacturers and government have taken in order to reduce production costs, to improve product quality and promote exports have been investigated.

Lastly in this chapter, the recent market trends of Europe, which is the largest consumption market of glassware in the world, is introduced.

3-1-1 Overview of the Industry

The total import value of glassware world wide in 1985, according to the 1985 International Statistics Yearbook compiled by the United Nations, was more than US$3 billion, and the average annual increase after 1983 was 1.3%. Regionally, Europe was the largest market, accounting for 47.8% of the total import value, followed by North America, Asia and the Middle East, accounting for 26.9%, 8.8% and 5.8%, respectively. Among major importing countries, the largest one was the U.S., accounting for 21.6% of the entire import value. West Germany, accounting for 8.1%, the United Kingdom 8.1%, France 7.4%, and Canada 5.3% followed Italy (See Table VII. 3-1 and Fig. VII. 3-1)

On the other hand, Europe was the largest supplying (exporting) region of glassware, accounting for 80.0% of the entire export value in 1985. France, accounting for 24.1% of the entire value, occupied first place followed by West Germany 16.6%,

Italy 10.2%, the U.S. 6.1%, the U.K. 5.7% and Australia 5.6%. (See Table VII. 3-2 and Fig. VII. 3-2)

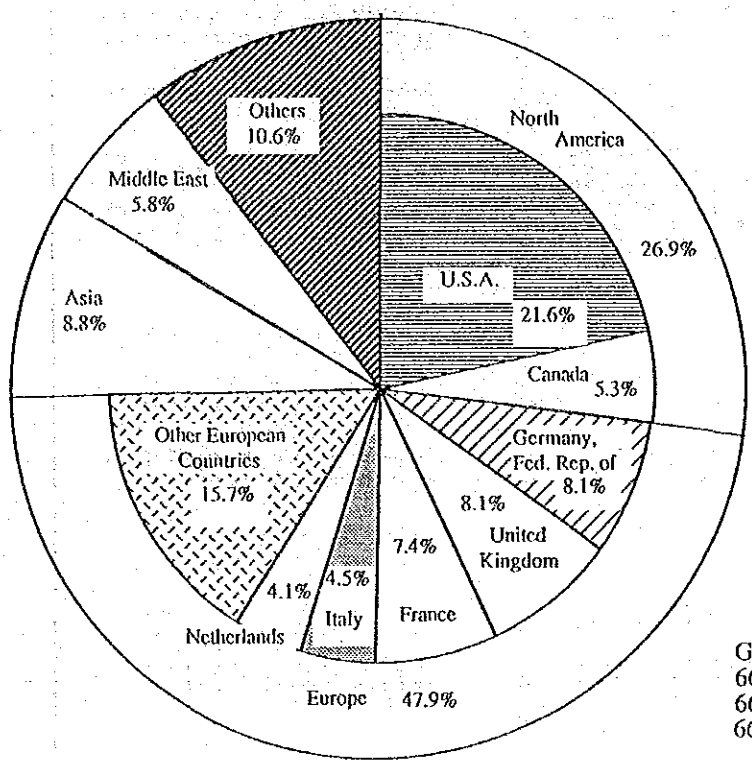
Table VII.3-1 World Import Market of Glassware

(Unit: 1,000 US$, %)

	1983	(%)	1984	(%)	1985	(%)
Region						
Africa	248,303	(8.1)	184,704	(5.8)	107,781	(3.5)
North America	649,204	(25.8)	817,696	(25.6)	849,904	(26.9)
Central & Middle America	178,191	(8.2)	159,301	(5.0)	117,531	(3.7)
Asia	252,913	(7.2)	253,355	(7.9)	277,810	(8.8)
Middle East	223,834	(7.3)	214,091	(6.7)	184,684	(5.8)
Europe	1,434,722	(46.6)	1,460,028	(45.7)	1,514,183	(47.9)
Oceania	91,819	(3.0)	106,601	(3.3)	103,225	(3.3)
Total	3,078,984	(100.0)	3,195,766	(100.0)	3,158,116	(100.0)
Country/Area						
United States	500,927	(16.3)	637,153	(19.9)	682,113	(21.6)
Germany, Fed. Rep. of	267,018	(8.7)	271,687	(8.5)	256,074	(8.1)
France	241,737	(7.9)	235,893	(7.4)	233,933	(7.4)
United Kingdom	211,450	(6.9)	232,925	(7.3)	255,799	(8.1)
Canada	148,277	(4.8)	180,543	(5.6)	129,169	(5.3)
Netherlands	133,422	(4.3)	129,547	(4.1)	167,791	(4.1)
Italy	110,530	(3.6)	127,479	(4.0)	142,150	(4.5)
Belgium-Luxembourg	108,413	(3.5)	101,788	(3.2)	112,739	(3.6)
Saudi Arabia	90,909	(3.0)	92,698	(2.9)	64,094	(2.1)
Swidzerland	82,881	(2.7)	80,911	(2.5)	86,094	(2.7)
Malaysia	19,263		15,746		18,295	
Japan	50613		65,947		69,283	

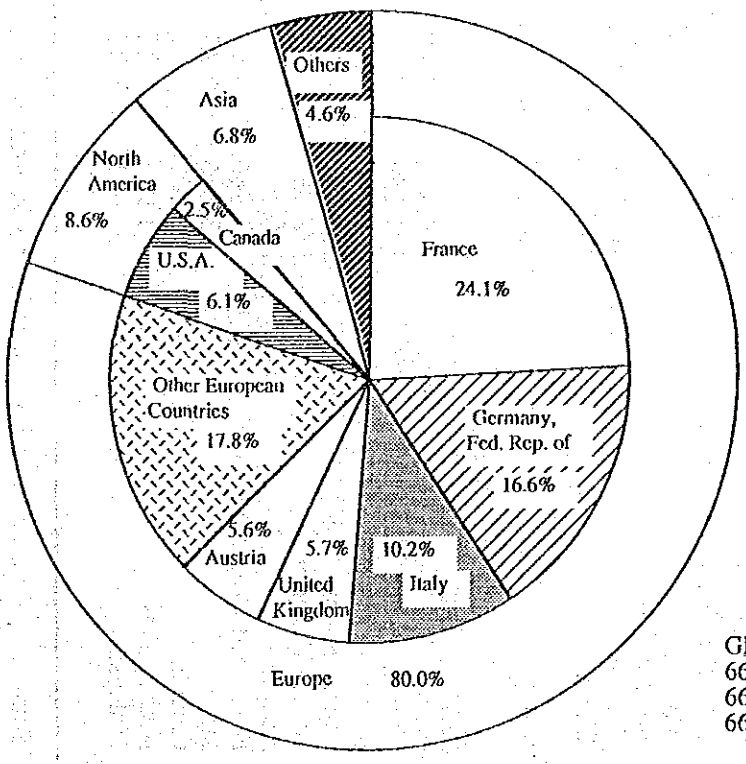
Source: International Statistics Yearbook, Volume II, United Nations, 1985
US General Imports FT 150, Dec. 1985

Fig. VII.3-1 World Glassware Market
(Total Imports in 1985)



Glassware Products:
665.1 Containers
665.2 Glassware
665.8 Articles made of glass

Fig. VII.3-2 World Glassware Market
(Total Exports in 1985)



Glassware Products:
665.1 Containers
665.2 Glassware
665.8 Articles made of glass

Table VII. 3-2 World Export Market of Glassware

(Unit: 1,000 US$, %)

	1983	(%)	1984	(%)	1985	(%)
Region						
Africa	5,989	(0.3)	3,978	(0.2)	4,013	(0.2)
North America	272,560	(9.1)	303,429	(10.9)	241,738	(8.6)
Central & Middle America	67,243	(2.5)	70,480	(2.5)	67,367	(2.4)
Asia	175,656	(6.5)	197,150	(7.1)	190,514	(6.8)
Middle East	43,203	(1.6)	49,927	(1.8)	46,803	(1.7)
Europe	2,107,846	(78.5)	2,151,199	(77.2)	2,250,340	(80.0)
Oceania	13,786	(0.5)	11,239	(0.4)	11,407	(0.4)
Total	2,686,278	(100.0)	2,787,403	(100.0)	2,812,182	(100.0)
Country/Area						
France	636,872	(23.7)	644,468	(23.1)	678,933	(24.1)
Germany, Fed. Rep. of	421,159	(15.7)	421,875	(15.1)	467,950	(16.6)
Italy	282,746	(10.5)	271,864	(9.8)	285,503	(10.2)
United States	202,458	(7.5)	230,838	(8.3)	172,740	(6.1)
United Kingdom	138,937	(5.2)	136,863	(4.9)	159,180	(5.7)
Austria	140,752	(5.2)	144,695	(5.2)	156,395	(5.6)
Belgium-Luxembourg	127,866	(4.8)	103,107	(4.7)	103,037	(3.7)
Japan	73,166	(2.7)	88,789	(3.2)	97,804	(3.5)
Canada	70,102	(2.6)	72,646	(2.6)	68,998	(2.5)
Netherlands	71,914	(2.7)	5,878	(2.6)	68,657	(2.4)
Malaysia	7,646	(0.2)		(0.2)	10,942	(0.3)

Source: International Statistics Yearbook, Volume II, United Nations, 1985
US General Imports FT 150, Dec. 1985

3-1-2 Export and Import of Glassware from and into Malaysia

Export statistics of Malaysian glassware in 1987 are shown in Table VII. 3-3. The largest importing country of Malaysian glassware was Singapore, accounting for 65% of the total export value of the products in 1987. By product item, more than half of the products exported to Singapore were glass containers. Following Singapore, in value of import of Malaysian glassware, were Hong Kong, accounting for 9.5%, Pakistan 5.8%, Thailand 3.5%, the Philippines 3.3% and Bangladesh 3.3%. These five countries together accounted for 90% of the total export value of Malaysian glassware.

By product item, the export of glass containers was especially focused on Singapore, accounting for 77%. Hong Kong, accounting for 11%, followed Singapore, and these countries were, by far, the largest importing countries of Malaysian glass containers. Export of glassware for laboratories varied among nations including Pakistan, Thailand, Bangladesh and the Philippines.

The statistics on import of glassware to Malaysia are shown on Table VII. 3-4. In 1987, France was the largest country to have exported glassware to Malaysia, accounting for 43.7% of the total import value. Singapore, accounting for 8.9% of the total import value, Indonesia 8.2%, Korea 7.8%, Japan 5.9% and West Germany 5.0% followed France. By category, the largest imported product item was household and office glassware, of which the major products were glass tableware. France, accounting for 61.3%, held the largest share of that supply followed by Indonesia, Korea, West Germany and Japan, accounting for 12.3%, 12.2%, 4.2% and 3.5%, respectively.

Table VII. 3-3 Export of Malaysian Glassware by Country/Area of Destination, 1987

(Unit: M$1,000)

	Glass Containers	Glassware Household/Office Use	Glassware Experiment/Lab	Glassware Decoration/Blind Lace	Others	Total
Singapore	21,231	406	189	3	97	21,926
Hong Kong	3,160	17	33	1	0	3,212
Pakistan	62	-	1,891	0	0	1,953
Thailand	-	22	1,169	0	-	1,191
Philippines	0	746	357	2	6	1,110
Bangladesh	410	0	698	0	0	1,107
Bahrain	953	0	0	0	0	953
Australia	746	19	0	1	1	766
Seychelles	393	0	0	0	3	395
U.S.A.	-	11	97	1	161	270
Indonesia	194	12	19	0	-	225
Brunei	138	33	1	0	2	174
Papua New Guinea	190	0	0	0	0	190
Fed. Rep. of Germany	1	54	106	0	0	172
Others	90	35	98	1	22	246
Total	27,180	1,311	4,658	9	276	33,890

Source: Malaysian Annual Statistics of External Trade

Table VII. 3-4 Import of Glassware to Malaysia by Country/Area, 1987

(Unit: M$1,000)

	Glass Containers	Glassware Household/Office Use	Glassware Experiment/Lab	Glassware Decoration/Blind Lace	Others	Total
France	823	15,497	825	0	5	17,150
Singapore	1,063	0	49	68	2,316	3,497
Indonesia	79	3,117	18	0	-	3,214
Korea, Rep. of	0	3,078	2	2	0	3,082
Japan	66	892	1,297	79	0	2,334
Fed. Rep. of Germany	87	1,072	518	0	282	1,960
United Kingdom	478	0	644	8	157	1,288
Taiwan	1,058	0	90	97	42	1,287
P.R.C.	91	642	291	1	19	1,043
Italy	137	497	6	54	131	826
U.S.A.	33	0	283	20	358	694
Australia	1	282	27	238	39	587
Hong Kong	168	27	1	18	178	392
India	15	11	75	14	230	344
Belgium	267	54	2	2	1	326
Denmark	14	6	10	72	2	104
Others	722	78	160	45	114	1,119
Total	5,102	25,253	4,298	718	3,874	39,247

Source: Malaysian Annual Statistics of External Trade

3-1-3 Production of Glassware in Countries/Areas Neighboring Malaysia

(1) Manufacturers of Glass Containers

Every country neighboring Malaysia, except for such small countries as Singapore and Hong Kong, produces sufficient volume of glass containers to meet domestic demand. Most of them have production capacities which are beyond of domestic demands, and it is supposed that these countries produce excess glassware although an increase in demand for glass bottles has been observed recently.

Profiles of some leading glassware manufacturers in countries neighboring Malaysia are as follows:

Indonesia

In Indonesia, the Kedaung Group, which has following 5 companies operating in the glass industry with 6 plants, plays the major role in the glassware industry:

1. P.T. Kedaung Industrial Ltd.
   - Site :Jakarta
   - Establishment :1971
   - Production Capacity :3 furnaces, 180 tons/day
   - Export Ratio :90%
2. P.T. Kedaung Subur
   - Site :Surabaya, Medan
   - Establishment :1975
   - Production Capacity :3 furnaces, 180 tons/day
   - Export Ratio :30%
3. P.T. Kedaung Medan Industrial Ltd.
   - Site :Medan
   - Establishment :1980
   - Production Capacity :2 furnaces, 120 tons/day
   - Export Ratio :30%

4. P.T. Kedaung Medan Gelas Industrial Ltd.
   - Site :Semarang
   - Establishment :982
   - Production Capacity: : furnace, 60 tons/day
   - Export Ratio :70%
5. P.T. Supreme Indo-American Industries
   - Site :Semarang
   - Establishment :1982
   - Production Capacity :2 furnaces, translucent glassware 0.25 million gross/year
   - Export Ratio :80%

The Philippines

1. San Miguel Corporation
   - Site :Manila, Cebu
   - Technical Assistance :Rockware Glass (ended in 1986)
   - Number of Employees :1,700
   - Production Capacity :5 furnaces 3 furnaces have capacity of 127 tons/day each)
2. Pacific Enamel & Glass Mfg. Corp.
   - Site :Manila
   - Technical Assistance :Rockware International
   - Number of employees :300
   - Production Capacity :2 furnaces, 105 tons/day
3. Union Glass & Container Corp.
   - Site :Manila
   - Technical Assistance :OI
   - Production Capacity :2 furnaces, 360 tons/day
4. Asia Brewery Glass
   - Site :Manila
   - Technical Assistance :Rockware International
   - Number of Employees :400
   - Production Capacity :Not available
5. Union Industries
   - Site :Manila
   - Production Capacity :3 furnaces, 120 tons/day

6. Ruby Industrial Corp.
   Site :Manila
   Production Capacity :Not available

Thailand

1. Bangkok Glass Industry Co., Ltd.
   Site :Suburbs of Bangkok
   Technical Assistance :Oberland Glass GmbH.
   Number of employees :500
   Production Capacity :2 furnaces, 300 tons/day
2. Thai Glass Industries Ltd.
   Site :Bangkok
   Technical Assistance :ACI
   Number of Employees :1,000
   Production Capacity :4 furnaces, 530 tons/day
3. Bangna Glass Works
   Site :Bangkok
   Number of Employees :2,400
   Production Capacity :2 furnaces (presently 5 furnaces, 300 tons/day
4. Siam Glass Industry Co., Ltd.
   Site :Bangkok
   Production Capacity :2 furnaces, 165 tons/day
5. Union Glass Co., Ltd.
   Site :Samutprakarn
   Production Capacity :5 furnaces, 165 tons/day

Taiwan

1. Taiwan Glass Industry Corp.
   Site :Taipei
   Production Capacity :2 factories (Glass container)
   2 furnaces, 350 dons/day (Glass tableware)
   1 furnace, 40-50 tons/day

2. Hwa Hsia Glass Co.

Site	:Hsinchu
Number of Employees	:320
Production Capacity	:2 furnaces, 130 tons/day

3. Formosan Glass Corp.

   Not available

4. TA Hsiang Container Ind. Co., Ltd.

   Not available

(2) Manufacturers of Glass Tableware

The number of manufacturers to produce glass tableware in countries neighboring Malaysia is relatively small, compared with those who produce glass containers. In any of the countries, the situation is similar to that in Malaysia in that most of the glass tableware is produced by the same manufacturers which produce glass containers, and many manufacturers are trying to diversify their products from glass containers to glass tableware.

Major manufacturers producing glass tableware in major countries neighboring Malaysia are shown below:

Indonesia

P.T. Kedawung Subur Ind. Ltd.

P.T. Pabrik Gelas Elok

The Philippines

Union Industries Inc.

Thailand

Asia Glassware Co., Ltd.

Thai-Ncip Glass Factory Ltd.

(3) Manufacturers of Light Bulbs and fluorescent Tubes

Thailand, Indonesia and the Philippines are the three countries where light bulbs and fluorescent tubes are turned out. Profiles of manufacturers of the products in those countries are as follows:

Taiwan

1. P.T. Sinar Angkasa Rungkut

Site	:Surabaya
Technical Assistance	:NEG
Production Capacity	:19 tons/day
Product Items	:Fluorescent tubes 13 mil.pcs./year
	:Incandescent bulbs 54 mil.pcs./year

2. Philips Radin

Site	:Surabaya
Technical Assistance	:Philips (Netherlands)
Production Capacity	:2 furnaces, 10 tons/day
Product Items	:Fluorescent tubes 12 mil.pcs./year
	:Incandescent bulbs 36 mil.pcs./year

3. Sibalec

Site	:Jakarta
Production Capacity	:30 tons/day
Product Items	:Fluorescent tubes 24 mil.pcs./year
	:Incandescent bulbs 72 mil.pcs./year

4. P.T. Sarana Gatra Utama

Site	:East Java
Technical Assistance	:Tungsram (Hungary)
Production Capacity	:17 tons/day
Product Items	:Fluorescent tubes 12 mil.pcs./year
	:Incandescent bulbs 30 mil.pcs./year

The Philippines

1. Philippines Glass Bulb

Site	:Manila
Technical Assistance	:Philips (Netherlands)
Production Capacity	:10 tons/day
Product Items	:Fluorescent tubes 6 mil.pcs./year
	:Incandescent bulbs 24 mil.pcs./year

Thailand

1. Lee Electric Glass Co., Ltd.

Site	:Bangkok
Technical Assistance	:NEG
Production Capacity	:34 tons/day
Product Items	:Fluorescent tubes 30 mil.pcs./year
	:Incandescent bulbs 54 mil.pcs./year

2. General Glass Co., Ltd.

Site	:Bangkok
Technical Assistance	:NEG
Production Capacity	:30 tons/day
Product Items	:Fluorescent tubes 30 mil.pcs./year
	:Incandescent bulbs 30 mil.pcs./year

3. Thai Toshiba Fluorescent Co.

Site	:Bangkok
Technical Assistance	:Toshiba Glass
Production Capacity	:18 tons/day
Product Items	:Fluorescent tubes 12 mil.pcs./year

3-2 Thailand

3-2-1 Production and Demand

At present, there are about 21 factories which produce glass tableware and ornaments. Some large scale industries produce many kinds of glassware including bottles, which are the main products. Most of them are situated in Bangkok, which is the biggest market in the country, or nearby provinces such as Samutprakarn and Nakornprathom. Leading manufacturers and their production capacities are shown in Table VII. 3-5.

The actual production capacity is approximately 80% of the nominal furnace capacity. In case of operation at higher capacity, the quality of the glass products will be lower. Therefore, the actual production capacity is estimated at around 63,600 tons/year. The production figures compiled by the Department of Business Economics between 1978 and 1983 are shown in Table VII. 3-5. There is no official or reliable industry records after 1983. The actual production in 1987 is estimated by an industrial source at about 54,000 tons.

Table VII. 3-5 Glassware Manufacturers in Thailand

Furnace Capacity: Tons/Year)

Name	Total Capacity	Tableware Ornaments Capacity
1. Thai Glass Industries Limited[1]	167,900	28,000
2. The Glass Organization[1]	102,220	5,000
3. Union Glass Co., Ltd.1)(BOI)[2]	21,900	4,500
4. Ocean Glass Co., Ltd. (BOI)[2]	n.a.	21,000
5. Thai Neutral Glass Ltd.	n.a.	4,000
6. Oriental Glass Mfg. Co., Ltd.	n.a.	3,000
7. United Glass Co. Ltd.	n.a.	4,500
8. Siam Glass industry Co., ltd.	n.a.	4,500
9. Others, e.g.	n.a.	
- Kong Thavon L.P.		
- T. Yongkiat L. P.		
- Thai Lucky Glass Co., Ltd.		
- Union Victors Co., Ltd.		
- and an additional 9 small producers		5,000
Total Furnace Capacity		79,500
Actual production Capacity (80%)		63,600

Notes 1: Factories which produce both glass bottles and tableware/ornaments.
2: Firms which have been promoted by the Board of Investment.

Sources 1: Ministry of Industry
2: Association of Thai Industries

Table VII. 3-6 Production of Glassware

Year	Production Volume (tons)
1978	19,276
1979	23,738
1980	24,600
1981	25,380
1982	27,000
1983	29,800

Source: Department of Business Economics, Ministry of Commerce

At present, Ocean Glass Co., Ltd. is the biggest producer of glass tableware. The company was established in 1979 with a registered capital of 100 million Baht with a promotional certificate from the Board of Investment (BOI). It is equipped with the most advanced technology in Thailand. The factory is located on a 32-acre plot of land in Bangpoo Industrial Estate. The Production facility and its technology were supplied by Sasaki Glass of Japan. After several years of assistance from Sasaki Glass, Ocean Glass can now operate by itself. Glassware products produced by Ocean Glass vary in many shapes and sizes, ranging from traditional glassware to products for OEM. The products include tumblers, ashtrays, plates, bowls, tea cups, beer mugs and coffee cups.

Nearly 80% of all the raw materials required for glass production are available in Thailand. These include sand, limestone feldspar and dolomite. Other materials such as soda ash, coke powder, sodium sulphate, selenium powder or cobalt oxide have to be imported.

Domestic demand can be estimated from actual production plus import minus export. The demand during 1978-1983 has been calculated by the Ministry of Commerce, the results of which are shown in Table VII. 3-7.

Table VII. 3-7 Domestic Demand for Glassware

Year	Domestic Demand (Unit: tons)
1978	19,643
1979	23,931
1980	25,234
1981	25,067
1982	26,706
1983	30,507

Source: Ministry of Commerce

The Industrial Finance Corporation of Thailand forecasted that there would be average annual growth of 9% between 1984 and 1988. Table VII. 3-8 shows the estimated domestic demand based on the forecast.

Table VII. 3-8 Domestic Demand for Glassware

Year	Domestic Demand (Unit: tons)
1984	33,250
1985	36,240
1986	39,500
1987	43,060
1988	46,930

Source: The Industrial Finance Corporation of Thailand

Demand for glassware between 1978 and 1983 can be divided into 3 groups. The demand for excellent glass accounted for 7% of the total demand, and the demand for good quality glass and medium quality glass accounted for 25% and 68% of total demand, respectively.

Usually demand for glassware depends on several factors, for instance, population growth level of income, level of education, lifestyle and fashion. The hotels, restaurants and cafes are exceptional cases as they have to use high quality glassware. Especially those hotels which are promoted by BOI can import glassware tax exempt. High income families also prefer imported products. This kind of preference brings about stable demand for import products.

3-2-2 Market Share of Imported Products

Imported glass tableware in 1987 for 3 major items is, in value terms, shown as follows:

Table VII. 3-9 Imported Glass Tableware

	(Unit: million baht)
Glass Tumblers & Drinking Glasses	7.23
Other Glassware	23.24
Decorative Glass	22.63
Total	53.10

Assuming that the 43,060 tons of domestic demand, which was estimated previously for 1987, has an average selling price of 30,520 Baht/ton, the local domestic demand in 1987 would be 1,314.2 million Baht. Compared the 53.1 million Baht imported with 1,314.2 million Baht domestic demand, it is reasonably assumed that the import products take about 4% share in the domestic market. It is considered that imported products do not play a significant role in Thailand.

Other than crystal glassware, various good quality glassware can be produced locally by Ocean Glass. Although the imported products have sophisticated design, quality, and production technique, they are still demanded by some limited market segment.