

# Small-Scale Metal Casting Industry in Indonesia: Situation and Problems

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## 1. Introduction

Metal casting industry has an important position as a basic industry in manufacturing industry. Indonesia has been making effort to become an industrialized country through broadening and deepening its industrial structure and through small-scale industries promotion and creating intra and inter industrial linkages. The key of the success of this effort is developing and strengthening its supporting industries. Metal casting industry is one of the supporting industry entangled in many sectors of industries.

However, since Indonesia is lacking modern industrial technology especially at supporting industry, it can not meet the demand of the modern machinery industries for their parts and raw materials in a wide sense. This tendency towards supply deficiency seems to become critical for Indonesia's industrial development in the future.

This paper explains the situation of small-scale enterprises of metal casting industry in Indonesia from the perspective of socio-economic aspects and attempts to find the factors that become obstacles to the development.

## 2. Overview of Indonesian Metal Casting Industry

In discussing the small-scale industries in Indonesia, one has to bear in mind that different agencies have different definitions of small-scale industries according to the respective purposes for which the definition is used (see table 1). These different definitions imply that the government is seriously considering what the policy on small-scale enterprises should be. It is linked to the policy objectives of the development of small-scale enterprises.

According to APLINDO (Indonesian Foundry Industry Association), there are around 150 foundries in Indonesia, of which 35 large and medium-scale casting industries belong to this association. However, this data does not seem to include a number of small-scale foundries operating in subdistrict Ceper and Tegal district of Central Java, Sukabumi district of West Java, and other places. Based on data compiled by International Development Center (IDC), Japan, in 1995, there are more than 450 foundries in various regions in Indonesia. They classified these enterprises into 4 groups according to technological levels, that is A, B, C and D. Group A consists of

**Table 1.** THE DEFINITIONS OF SMALL-SCALE INDUSTRIES/ENTERPRISES

Institutions	Category		
	Financial	Number of Workers	Others
Central Bureau of Statistics (*)		-Small-scale Industry 5–19 workers -Household Undustry < 5 workers	
Ministry of Industry	(**) (1990) Small-scale Industry: Total assets, excluding land and building: < Rp. 600 mil.		The owners should be Indonesian citizens
Bank Indonesia	1990: Small-scale Industry: Assets, excluding land and building: < Rp 600 mil.		A minimum of 50% of the total assets should be owned by indigenous, and some of the board of directors are indigenous
Ministry of Trade	Small-scale Business: Active capital for trade < Rp 25 million		
Ministry of Finance	Small-scale Business: Assets and turn over excluding land, building: max. Rp 300 million		
Chamber of Commerce	Small-scale Business: -For trade, farm and services Active capital < Rp 150 million. turnover < Rp 600 million -For Manufacture, Construction Active capital Rp 250 million turnover < Rp 1 billion		
Small-scale Enterprise-Promotion Law (UU-UK or “Undang-Undang Usaha Kecil”) No.9/1995	Small-Scale Enterprise: Assets max Rp 200 milion, excluding land and building and turnover max Rp. 1 billion.		

Note: (\*) According to Central Bureau of Statistics: Medium-scale Industry: 20–99 workers

(\*\*) According to Ministry of Industry: Large and Medium-scale Industry: Total assets is more than or equal to Rp 600 million ( $\pm$  US\$300,000 at the prevailing exchange rate US\$1 = Rp 2000, -)

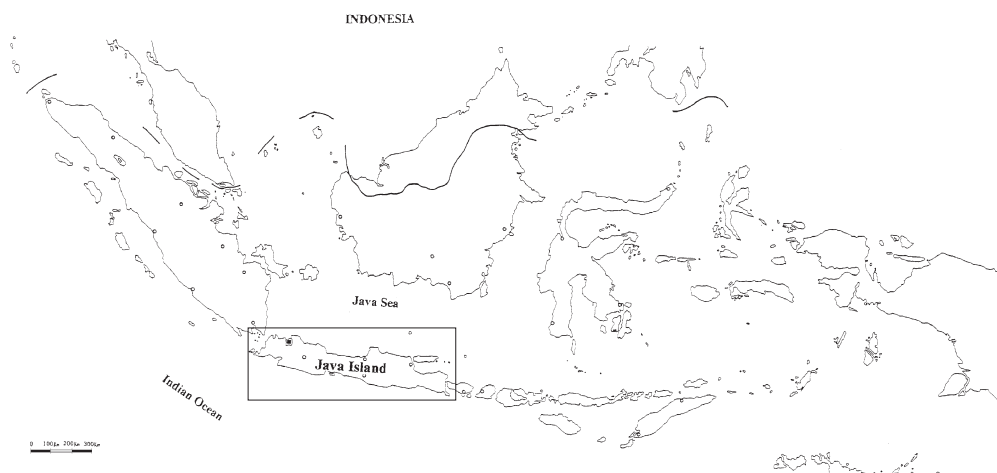
Source: Husaini, Martani et.al (1996); Central Bureau of Statistics; Sjaifudian, Hetifah et.al (1995); Information from Regional Representative of Ministry of Industry and Trade in Klaten reGENCY, 1996; Lembaran Negara Republik Indonesia Tahun 1995, No. 74

foundries that can supply parts/components to automotive and electrical machineries because they are able to produce high-quality products at the same level as their Japanese principals. Group B consists of foundries that have slightly inferior in their technology and production facilities. However, because they are aware of their product quality, if they receive assistance from their foreign counterparts, they may improve to become group A. Group C consists of foundries that have intention of development, but their product quality is low because their level of technology, production facilities and management are not sufficient, so that they have not intention to make endeavor to upgrade their production facilities, improving their technology and management. Group D consists of foundries that are fragile and not aware of or do not care about their product quality, so that their survival in the future is sceptical. The locations and numbers of these foundries are shown in table 2 and figure 2.

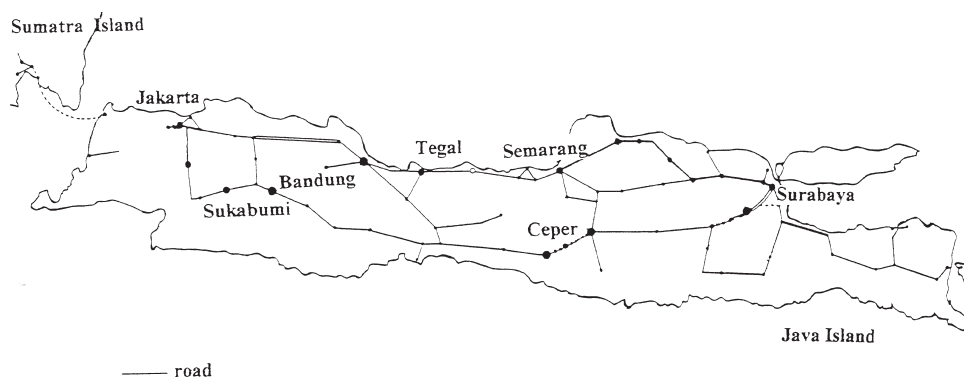
Two of these locations where a number of small-scale foundries, namely, Tegal and Ceper, have had historical background of their metal industries since the kingdom periods in Java Island. The first place, Tegal, had metal industries which produced plowshare made by blacksmiths since the 16th century (Rustiani and Maspiyati, 1996). Then Collin Brown (in Rustiani and Maspiyati, 1996) who studied about Tegal 1920–1980 explained that it's metal industries developed to produce various agricultural equipments along with the development of sugar plantations in 1920s. The metal products of home foundries were used by sugarcane farmers, while the metal products in the general markets were imported mainly from Japan to meet domestic demand. Among various metal industries, there were 2 units of Dutch's metal factories established in 1920s which produced components of sugar factories' machines and flatcars and components of trains. However, at the beginning of 1930s, the worldwide great depression caused the sugar factories in Tegal faced difficulties to operate. Therefore, four of the seven sugar factories in Tegal stopped operation and one was bankrupt. At the same time, the Dutch colonial government issued a restriction of importing metal commodities policy. This situation brought metal home-factories a chance to develop through filling up the market vacancy of metal products. However, around 1950s to 1960s, the metal home-industries had gone to the period of stagnancy because of the national social-politic instability.

In 1970s to early 1980s they regained their prosperity. This situation was related to the development of infrastructures in big cities, particularly Jakarta. However, the second oil crisis in 1979s indirectly influenced metal home-industries in Tegal. The price of raw material soared sharply resulting to increase the production costs, then they could not compete with the imported products, mainly from China. In addition, in the beginning of 1980s other metal-product factories were springing up in JABOTABEK (the greater metropolitan area which consists of Jakarta, Bogor, Tangerang and Bekasi) which seized their segment of potential market.

The second place, Ceper sub-district in Klaten district, located between two big cities of Yogyakarta and Solo, in Southern part of Central Java also has historical background. It was like a legendary story that there were 4 wanderers from Banten



**Figure 1.** Indonesia



**Figure 2.** The Locations of Metal Casting Industry in Java Island

**Table 2.** Locations and Numbers of Indonesia Foundries

Groups Total	Jakarta	Bandung	Sukabumi	Tegal	Semarang	Ceper	Surabaya	Others*	Locations
A, B	20	2	1	0	3	1	3	0	30
C, D	30	0	40	30	5	320	5	20	450

Source: International Development Center, Japan, 1995.

Note: \* Pasuruan and Malang in East Java (author's information from Regional Representative of Ministry of Industry and Trade in Surabaya municipality, 1996).

region of West Java came to Ceper in Mataram Kingdom period (1613–1645). One of the wanderers, called Ki Ageng Serangkusumo, settled at Ceper to teach the local inhabitants to make a plowshare as an agricultural equipment. The local inhabitants has been believing this legendary story. They still worship the wanderer's grave as a pioneer of the metal foundry in this area up to now. However, it was said that the metal home-foundries in Ceper began since 18th century. (Anshoriy 1995, Mulyanto 1982 and Van Niel 1967).

The technological development of using melting furnace can be observed in this area. The oldest type of furnace so-called "besalen", still exists, though only one unit, and is still operating to produce brass melting products such as bells and cookie-molds. "Besalen" is a brickkiln. The ladle is made of clay and become hard when baked in "besalen." The brass is put in the ladle and melted in "besalen".

As mentioned above that the development of metal home-foundries in Tegal was influenced by the existence of sugar factories, so did in Ceper. According to Gondang Baru Sugar Museum of Klaten, Central Java, there were 10 units of sugar factories in Klaten district. They were established in the period of Dutch colonial government. Two of them are still in operation until now, that is, Gondang Baru (with the old name Gondangwinangun) established in 1860 and Ceper Baru sugar factories established in 1918. The others were closed and destroyed during the periods of great depression in the early 1930s, Japanese occupation, independence war against Dutch, and political unrest in the early Indonesian independence days (PT. Perkebunan XV–XVI, PG. Gondang Baru 1995; Anshoriy 1995; Allen and Donnithorne 1962). Since then, the metal-home foundries in Ceper received order for making axles of flatcars and other components from the existing sugar factories. They developed not only through work for the sugar factories' orders, but they themselves also made agricultural equipments and household appliances such as wok, charcoal iron, iron mortar, pulley and so on, and then some of them sold their products to general markets. It was also said that in the Japanese occupation period, the local inhabitants were forced to make military armaments such as shell of grenade.

Since 1953, in the independence period, they began to use melting furnaces called "tungkik" furnace<sup>1)</sup> which is the simplified type of cupola furnace. According to Japanese team who came to Ceper, this kind of furnace is recognized as the old type of China furnace. It was said that this type of furnace is made locally and more cheaply than cupola furnace with durability of 4–5 years, so that the local inhabitants can afford to buy. Most of the metal home-foundries in Ceper (and also in Tegal) use the "tungkik" furnace until now. Some of them use cupola furnaces (low-frequency induction furnace) and a few of them use high-frequency induction furnace (Yamanaka, 1995; Hayashi, 1995; Bulletin KLINIK INDUSTRI, 1995).

The government's policy of "localization" or "deletion programs" to promote the

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1) "Tungkik" means slanting position. It shows the way of operating this furnace when pouring the melting metal by slanting it's position.

development of local supplier industries has also influenced the development of metal home-foundries in Ceper which could manufacture parts and components for the various assembling industries. As the implementation of the policy, Ministry of Industry subsidized some technological equipments to the local metal home-foundries in Ceper through Baturjaya cooperative of metal machining service, established in July 23, 1976.

### **3. Current Promotional Policies**

In trying to foster the development of small-scale enterprises, the Ministry of Industry's guidance has focused on:

- (1) assisting them in overcoming their market problems by the Foster Father-Business Partner ("Bapak Angkat-Mitra Usaha") linkage scheme.
- (2) assisting them in their production and financing problems.
- (3) assisting their institutional development by encouraging them to form cooperatives or limited liability companies (Co.Ltd)
- (4) making more balanced development of large and small-scale enterprises.

The industrial policies affected the development of small-scale metal industry, most of which were issued by Ministry of Industry — which then merged with Ministry of Trade becoming Ministry of Industry and Trade, since December 6, 1995, based on the Presidential Decree No. 338/M/1995 — listed as below (Thee 1993; Prawirokusumo and Tampubolon 1994; Hamid 1995):

- a. *Ministerial Decree No. 517* issued November 30, 1980, on reserving a certain field for small-scale industrial activities. The reserved fields cannot be allowed to be operated by large and medium-scale enterprises and by small-scale enterprises which all or part of their assets owned by large and medium-scale of enterprises. The reserved fields consist of industries producing products for local or rural markets, industries producing art products, etc. The decree aimed at providing the small-scale enterprises with a chance to develop, which were expected to create employment widely, and to spread the industrial activities over the regions to support their regional development.
- b. *Ministerial Instruction No. 112* issued March 17, 1980, on making use of reject products or waste for small-scale industrial activities.
- c. *Ministerial Decree No. 307* issued in 1976, on scheduling the gradual deletion of specified components from the imported CKD (completely-knocked-down) kits and their replacement by locally made components for the assembly of commercial vehicles: trucks and buses. In pursuing the localization program for the commercial vehicle industry, the local small and medium-scale enterprises were hampered by market fragmentation due to the large number of commercial vehicle assemblers, proliferation of models and the concomitant of the lack of standardization within the small domestic market. Such situation results in small orders for local component suppliers which, in turn, can prevent them from growing to become viable suppliers.

- d. *Ministerial Decree No. 168* issued in 1979, on reducing the number of type of commercial vehicles which could be assembled. This policy indicated a government's awareness of the problem of market fragmentation facing Indonesia's commercial vehicle industry, and of urgent need for rationalizing and standardizing the commercial vehicle industry for building up viable local suppliers.
- e. *Ministerial Decree No. 368* issued in 1980 by the Ministry of Industry was the implementation of joint decree of Ministry of Trade, Cooperative and Industry No. 536 issued in 1979 and No. 166 issued in 1979 on importation of second hand machine and its equipments.
- f. *Ministerial Decree No. 651* issued in 1981, on rationalization of the motorcycle industry. This decree stipulated that each approved motorcycle assembling firm was only allowed to assemble a maximum of five models. It also stipulated that in case the assemblers assemble less than five models, no increase in the number of models would be permitted. This policy effectively forestall the model proliferation.
- g. *Ministerial Decree No. 198* issued in 1983, on the deletion of components from the imported kits and their replacement by locally made components for the assembly of diesel engines.

Other major current promotion programs for small-scale enterprise development can be classified into two major categories, namely, Subsidized Credit Programs and Technical Assistance Programs. These are explained as below (Thee 1993; Pangestu 1996):

#### *Subsidized Credit Programs*

Subsidized credit to small-scale enterprises, which came in the form of Small Scale Investment Credit/Permanent Working Capital Credit (KIK/KMKP = "Kredit Investasi Kecil/Kredit Modal Kerja Permanen") launched in 1973, was aimed at helping small-scale enterprises (including cottage enterprises), and also directed at the indigenous people's enterprise. The credit programs were administered through Indonesia's five state-owned commercial banks, the Indonesian Development Bank (BAPINDO), the 27 Regional Development Banks (Bank Pembangunan Daerah), and 14 private national banks which around the mid-1980s had altogether more than 1000 branch offices throughout Indonesia, which received liquidity credit from Central Bank ("Bank Indonesia") at low interest rates 3–6%. Then the banks finance all or a large part of the credit program. They loaned it out to the small businesses at interest rates below market rate and at various term of maturity (3–20 years).

The KIK/KMKP program can be said to have succeeded in terms of the amount of loans given out and the number of recipients reached. By 1982, 23% of subsidized credit was for small-scale enterprises. Under KIK, in April 1990, there were 334,000 recipients with value of credit amounting to Rp 1.9 trillion, and under KMKP there were 2.5 million recipients with value of credit amounting Rp 5.8 trillion. The interest rate of 12% on KIK/KMKP was much lower than the commercial lending rate, more



than 20%, in 1990 (Pangestu 1996).

However, most evaluations of the KIK/KMKP conclude that while there has been some degree of success, there were many of weaknesses and problems with this program. It means that this program was not optimum in achieving the objective. The objective of the program was to provide access to small-scale indigenous enterprises which often did not have collateral to get commercial loans. According to Grizzell (1988 in Thee 1993) the program had probably failed because of the high default rate, around 27%, due to arrears and collection problems. This high default rate was endangering the self-sustainability of this program. Furthermore, Grizzell also attributed the high default rate and serious problems to the inadequate staff training, corruption, mismanagement of funds, inadequate penalty for default or incentives for the bank staff to make the collections.

Since January 1990, KIK/KMKP was converted into Small-Scale Enterprises Credit ("Kredit Usaha Kecil" or KUK). Government announced a package of regulation called The January Package ("Paket Januari" or PAKJAN) to improve the system of credit allocation in the form of reducing in stages the availability of liquidity credits to banks and non-bank financial institutions. The credit programs using liquidity credits were reduced from 23 types to only 4 types. The remaining four programs are: Farmers Credit ("Kredit Usaha Tani" or KUT), Credit to Cooperative ("Kredit Koperasi"), Credit for the Supply of Food and Sugar to the State Logistics Agency ("Kredit Pengadaan Pangan dan Gula kepada BULOG"), Investment Credit ("Kredit Investasi"). Liquidity credit is still provided to the plantation sector, housing loans with maximum Rp 50 million/customer.

Other than reducing the number of directed credit programs, in accordance with achieving a more balanced development of large and small-scale enterprises, all banks except for foreign bank's branches and joint-venture banks, must allocate 20% of their credit to small-scale enterprises as KUK (Small-Scale Enterprises Credit). To widen the scope of distributing KUK, the provision of small scale credit can be provided through cooperation between general commercial banks and the general People Credit Banks ("Bank Perkreditan Rakyat" or BPR) which know their customers better in their regions (Prawirokusumo and Tampubolon 1994).

It seems that the quantitative target have been achieved. At present, on average the 20% KUK out of total credit for all banks seems to have been reached. However the growth of KUK credit has been slower than total credit growth, so that the KUK program does not reach the target in the optimum way whereas the objective of the KUK is achieving equity and improving the access to small-scale enterprise. It could be happened because there are several weakness and side effects of the implementation of KUK (Pangestu 1996).

First, large banks tend not to have the know-how, capability and experience to lend to small-scale enterprises. The possibility to cooperate with People Credit Banks and other banks is not easy to implement because the general commercial banks tend to give specialized handling to KUK, so that the operational costs increase. Further-



more, it can limit the amount of credit that they can give out because the bank must think whether the KUK quota can be met and finally the bank raise the overall interest rate of credit.

Second, there is some inconsistency that Central Bank links the KUK with the soundness rating of the bank, while KUK loans tend bearing high risk. Increasing KUK will no doubt increase the riskiness of the loan portfolio.

Third, the banks have found ways to reach the KUK requirement such as through giving three Rp 200 million loans to the same customer but in three companies. Such efforts increase the cost of transactions for the banks without policy having reached its target. It also indicates that the enterprises which can not be said as small-scale any more utilize the program (Sjaifudin et. al 1995).

Fourth, because the definition of small-scale is likely to vary by sector (services, manufacturing and agriculture), area (urban, rural), and technology used (labor intensive and capital intensive), it is questionable whether the program reaching the small-scale enterprises. The quantitative target of 20% is also questionable because the criteria to come up 20% target is not clear.

Besides those programs mentioned above, the government introduced special schemes and institutions for small-scale credits. One of them is about allocation of 1–5% of the State Owned Enterprises's (BUMN's) profits to the development of small-scale enterprises. It was introduced in 1989 by Ministry of Finance's decree No. 1232 with its guidance based on the decree No. 316 issued in 1994. A large portion of the funds are provided in the form of credit at lower interest rate than market rate.

#### *Technical Assistance Programs.*

The most important program to provide training and extension services to small-scale enterprises is being provided by the Small-Scale Industries Development Program ("Program Bimbingan dan Pengembangan Industri Kecil" or BIPIK), which was initiated and carried out by the Directorate General of Small-Scale Industry, Ministry of Trade and Industry, at the central government level and the major provincial cities. On the provincial-level, small-scale manufacturing service centers called PPIK ("Pusat Pelayanan Industri Kecil"). The BIPIK is a coordinated program of input provision for small-scale enterprises, under which technical assistance is provided to clusters of them. The concept of clustering is a major element of the BIPIK scheme, which actually dates back to the 1950s when Indonesian government established Industrial Centers ("Induk Industri") to provide technical assistance, particularly to the indigenous weaving industry. However, this program of Industrial Centers was unsuccessful because of insufficient funding and part of the small entrepreneurs' reluctance to utilize the offered facilities (Grizzell 1988 in Thee 1993). According to Thee (1993), the insufficient funding can be attributed to the fact that in 1950s, Indonesian government was much more concerned about the problems of political consolidation and nation building than that of economic development, including the promotion of small-scale enterprises.

Despite the early failures, the BIPIK scheme has again stressed the development of industrial clusters (Centers of small-scale Industries or “Sentra Industri Kecil”), which generally 50 to 100 small manufacturing establishments, including cottage establishments. These industrial clusters are supported by Technical Service Units (“Unit Pelayanan Pelayanan Teknis” or UPT) which are staffed by Field Extension Officers (“Tenaga Penyuluh Lapangan or TPL) who have received special training and provide extension service as well as simple training courses (Thee 1993 and Mizuno 1996).

Since 1979, Small Industrial Estates (“Lingkungan Industri Kecil” or LIK) have been introduced in some regions with a relatively large concentration of small enterprises in regions where specific skills appropriate to small-scale enterprises are available. The major facilities available in LIK are facilities for education and training and facilities for improving the quality of the products. However, as Grizzell said that the UPT and LIK have not been successful, as indicated by the low occupancy of these facilities and the low productivity of the small-scale enterprises in these facilities. It happened because the field extension officers have generally little or no technical and business experience. Moreover, the training and subsidized inputs in these facilities are provided according to a schedule determined by central planners rather than the needs of the existing and potential small-scale enterprises.

Related to the technical assistance, actually there is a technical institution in the public sector, namely, MIDC (Metal Industry Development Center), under the Ministry of Industry. This institution was established in 1970 and has been operated since 1973 with the aim to support and guide the metal industries in promoting their product quality. This institution received supporting fund from Belgium government in the form of technical assistance, machineries and equipments. According to the study done by IDC (Japan)’s team, those machineries and equipments has been still operated. However, in doing FCD testing, the melting furnace is Fullminer Furnace, not cupola furnace as used by most of the metal foundries in Indonesia. Moreover, according to Hayashi (1995), not many foundries in Indonesia have taken advantage of this institution although they know this institution’s existence and activities. The reasons are low and insufficient level of the technologies or old-fashioned facilities, poor or insufficient quality of the services, complicated procedures, insufficient information on its services and functions and expensive usage fee.

The other program handled by BIPIK is a “Foster Father-Business Partner” partnership and linkage system (“Sistem Keterkaitan dan Kemitraan”). The implementation of the policy of establishment of linkage and partnership system has recently been officially launched as national movement (“Gerakan Nasional”) since February 14, 1991. The linkages between the Foster Father (i.e., a large-scale enterprise) and its Business Partner (i.e., small-scale enterprise) is to make a cooperative arrangement between the large-scale and the small-scale enterprises, based on the principles of mutual need, mutual reinforcement and mutual benefit (Thee 1993). The large-scale enterprises which, because of its access to domestic and/or export markets, are in

good position to assist small-scale enterprises in marketing their products.

As mentioned above, Ministry of Finance decree in 1989 stated that state-owned enterprises (BUMN) could put aside 1–5% of their net profits to assist small-scale enterprises. The government would expect all the large-scale enterprises, including both the private and the state-owned enterprises (BUMN) to participate in this program, under which the “foster-father” are also expected to guide the small-scale enterprises by:

- (a). Raising their capability in management, process technology, financing to purchase raw materials and marketing.
- (b). Acting as guarantor of small-scale enterprises in their loan applications (Suhardi 1992).

Undoubtedly, the pressure exerted on the large enterprises which has resulted a rush of cooperation agreements being signed by large enterprises and a large number of their “business partners” (small-scale enterprises). It was shown by the fact that by the end of 1991 cooperation agreements had been signed by 4,698 large-scale “foster-father” enterprises with 21,983 small-scale “business partners” in 22 of Indonesia’s 27 provinces (Suhardi 1992).

It is too early to make an assessment of the impact of this linkage program. There have been various instances where this program has been successful, particularly in which the “foster-father” have successfully marketed the products through their own marketing channels in the domestic as well as export markets, however, there has also been some skepticism about the effectiveness of this linkage program, as “forced partnerships” are unlikely to be viable, particularly if one of the partners, specifically the large firm, gets little or no benefit from this partnership, except some political goodwill.

Recently, the skepticism about viability of this program has become an important issue. It can be seen from both sides of small and large-scale enterprises (KOMPAS July 6, 1996). From the large-scale enterprises’ side, they may not gain any economic benefit from this program, but may gain legitimacy and or receive any other form of benefit from the government. There is a wide gap of technological and managerial capabilities between the large and small-scale enterprises. Moreover the small-scale enterprises can not comply the consistency of large-scale enterprises’ demand in quality and delivery time as their approved agreement. On the other side, the payment of the products from the large-scale enterprises to the small-scale enterprises takes 3–4 months after delivery time, which inflicting trouble on the small-scale enterprises in operation because their limitation of working capital (KOMPAS July 6, 1996 and Bulletin KLINIK INDUSTRI 1993).

Finally, all the government’s effort in promoting the development of small-scale enterprises has been legislated in December 26, 1995 by law No. 9/1995 for small-scale enterprises (UU-UK or “Undang-Undang Usaha Kecil” or Small-scale Enterprise Promotion Law). The major contents of this law include, (1) financing resources, and its mechanism between private and state financial institutions, including

bank and non-bank; (2) providing guarantors for small-scale enterprises to access the finance resources; (3) promoting the partnership and linkages between large and small-scale enterprises under which it is expected as an effort to enhance the capability of human resources and technology, and also (4) simplifying the procedure of licensing the small scale enterprises.

#### **4. The Current Situation of Small-scale Metal Casting Industry**

As mentioned above, there are 4 groups of metal casting enterprises based on the technological level, facilities and management systems, namely, Group A, B, C and D. Most of small-scale enterprises are belonging to the group C and D, which lack the technological capabilities equipped with poor production facilities resulting in low product-quality. Most of them, particularly ferrous casting enterprises, use the old-type melting furnaces, that is “tungkil” furnace. Some of them use cupola furnace and a few of them have already introduced induction furnace. The non-ferrous casting use crucible furnace. The metal foundries in Sukabumi and some in JABOTABEK — is an abbreviation of Jakarta, Bogor, Tangerang and Bekasi — are doing aluminum alloy casting, while in other places, particularly Tegal and Ceper, most of them are ferrous casting. The main raw materials of aluminum alloy casting are ingots and scrap aluminum. Ingot is a block of metal which its composition of the metal substances had already arranged, for example: Al-Cu, Al-Si, Al-Mn, Al-Ni, etc. Most of the foundries in Sukabumi use scrap aluminum because it is cheaper than ingots, so its composition is questionable. The raw materials of ferrous casting are scrap iron and pig iron. Pig iron is more expensive than scrap iron because it is imported material, mainly from China and Russia. The scrap aluminum and scrap iron are locally collected ones bought from local raw material suppliers. The fuel of ferrous casting is cokes, imported from China and Japan with different quality and price. The fuel of aluminum casting is charcoal.

Not only the melting furnaces are the old types, but also the technique of making molds is simple. In aluminum alloy casting, they use either shell molds or permanent molds. The shell mold is made from mixture of green sand, resin, silica sand, then hardened and burnt by blowing flame. The permanent mold is made from metal.

The ferrous castings use floor sand-mold that made from mixture of green sand, mollasses, resin, cement and other ingredients. The mold are hardened manually. Only a few of them hardened by molding machine. Molten metal and molding sand are controlled manually without utilizing any testing equipment.

The products of these metal foundries are too various because they work depend on orders. Most of the foundries in Sukabumi received orders from suppliers of State Electricity Enterprise (PLN or “Perusahaan Listrik Negara”) to make wedge clamps, strain hook clamps, pole brackets, protective caps, join clips, etc. The ferrous foundries in Tegal and Ceper are in the similar conditions with Sukabumi that is too various products and working depended on orders. The products of ferrous casting can be divided into two major groups: firstly, a group of products which do not need further

processing after taking out from the molds. These products are generally used directly or as art-goods and not required high quality and dimensional accuracy, such as gardening stand of lamps, gardening tables, ornamental fences, artistic frame of lamps, train brake-blocks, components of scale, sport equipments, etc. Most of the foundries producing these products have no linkages with larger foundries, but some of them have customers who then might become their sales agents. Secondly, a group of products need further processing such as boring, lathing and grinding. It needs higher know-how to produce these products. Generally the products are parts or components of other products, for example, electrical or machinery parts, components of agricultural machinery, brake shoes, pipe fittings, pipes, pulley, brake drums, gas burners, etc. The foundries that produce these components may have linkages with larger foundries or assemblers. Moreover, they produce finished or semi-finished goods, depending on their clients' demand. The demand of finished goods means that the producers have to do the machining process of grinding, lathing, boring, etc., after the products taken out from the molds before giving them to their clients. The demand of semi-finished goods means that the producers do not need to do those processes of machining, but it might be done by their clients. Accordingly the price of semi-finished goods is cheaper than that of the finished goods.

## **5. Obstacles to Development**

Taking into account that Indonesian government has already launched numerous regulations and programs for promoting the development of small-scale enterprises, this section explains the major obstacles to small-scale metal foundries' development which can be seen in two points, firstly, obstacles related to the relationship between the small-scale metal foundries, as receiver, and larger enterprises, as giver orders. Secondly, obstacles actually happen inside the small-scale foundries.

### *Small-scale Metal Foundries vs. Larger-scale Enterprises*

As mentioned above, the products of small-scale metal foundries are too various because they work depend on orders coming from larger enterprises which getting tender from government's projects. Therefore, they are not primary suppliers, but probably they are the second, third or the umpteenth suppliers. Thus, the linkages between large and small-scale enterprises have already happened in fact in the form of giving and receiving order relationship. However, the sense of these linkages is different with that of the government's promotional policy in trying to foster the development of small-scale enterprises through partnership and linkage system. The government's policy implies that the linkages can be a permanent or long-term relationship between the small and large enterprises. The fact showed that the linkages are usually created ad hoc between them through giving and receiving order relationship. Thus, the small-scale enterprises depend on the steadiness, credibility and bona fides of the enterprises giving orders to them. Under this kind of relationship, the small-scale enterprise are often suffered by their clients' manners of business. More-

over, it usually occurs that the small-scale enterprises carry out the orders without down payment, so that the clients might not take back their orders. It will be more suffering if the small-scale enterprises will be paid several months after the orders delivered, or be paid by a bad cheque. It will affect the small-scale enterprises' money turn over, because of their limitation of working capital. Thus, they have to borrow raw material from material shops, of course the price is higher than market price, or they resort to liquidate their cheque before its due with lower amount of payment, or they finance through informal finance institutions, such as family, friends or usurers with higher interest rate.

The Small-scale Enterprise Promotion Law (UU-UK) No 9/1995 was established with the intention of giving facilities to small-scale enterprises in financing (including providing guarantors), licensing, guidance, and of promoting partnership and linkage between small and large-scale enterprises, even in the aspect of production, marketing, human resources and technical assistance. However, the protection for small-scale enterprises in making business transaction with their clients (large enterprises) has not been noticed. Oey (1996) pointed out that UU-UK seems to be focused on giving facilities to the small-scale enterprises rather than law protection. Although the article 11 of the UU-UK indicates giving assignment to the government to stipulate a policy of preventing the small-scale enterprises from suffering in making transaction with the larger enterprises, the factors of giving facilities and protection are necessary for promoting the small-scale enterprises.

Certainly, there are some financial programs and schemes as mentioned above, that can help small-scale enterprises. However, the financial programs are unlikely to be viable or effective because they require low-credit complicated and time consuming procedures notwithstanding their quite low credit ceilings. On the other hand, from the lenders' view, these programs offer very low profitability with high transaction cost, high default rates, serious collection problems and few staff with sufficient skill to appraise loan applications.

The other obstacles are about the small-scale metal foundries in meeting their clients' demand. As mentioned above, most of the small-scale metal foundries produce low quality products due to insufficient technology and their old-fashion machinery and equipment. The low quality of their products is indicated by the rejection rate of products by their clients. The low production capacity is indicated by late or unstable delivery time. Therefore they need to modernize their machinery and equipment and take effective and efficient measures to improve the quality of the products and delivery time. Hayashi's study (1995) showed that the small-scale industries have intended to purchase new-fashioned machinery and equipments, that means they need to improve their production facilities through capital investment in plant and equipment. However, their intention has been hampered by the high price of machinery and equipment, severe loan conditions such as high interest rate (lending interest rate is more than 20%), short repayment period, insufficient loan amount, severe requirements for collateral, etc, all of which related to the financial matters. However, it is



questionable if it is said that the small-scale enterprises lack of capability to make capital accumulation for improving their production facilities, while they can have “prestigious” cars, houses and social status as pilgrims.

Moreover the technical assistance programs in the form of partnership and linkage between small and large-scale enterprises was expected to guide the small-scale enterprises by raising their capability in management, technology, financing to purchase raw material, marketing and acting as a guarantor in their loan applications. However, this program is unlikely to be viable with the reasons as mentioned above. In addition, the way to carry out this program is necessary to be noticed. This program has been carried out by sending 1–2 persons from each small-scale foundry through apprenticeship to the large-scale industry. However, it is questionable who have participated in this program, because the participant might be a relative of the small-scale foundry’s owner who does not involve in this enterprise, or involve as an administrative staff but not in technical activities, or might be an employee. It also could be presumed that the owner sent his persons with merely the expectation of receiving financial, marketing and technical assistances in the future. If the participant is an employee, the small-scale enterprise probably gain some benefit in the future, but what status the employee has? It is related to the employment system which will be explained in the following section of this paper.

#### *Inside the Small-scale Metal Foundries*

Most of the small-scale metal foundries employ temporary workers. They are paid based on daily wages (“harian”) or piece-work wages (“borongan”). There are no permanent employment relationship between workers and enterprises. The workers easily and freely move from one to another enterprise. It goes on because of the fluctuation of the number of orders received. Moreover, the workers who work based on the piece-work wages chase the target amount of products as quick as possible in order to be able to work in other places. Thus, the workers are not motivated to produce goods of good quality and not proud of the place where they work. When the orders are slack, the workers move to another flourishing enterprise. Certainly, the unstability of orders is not the only factor that make them easily move. The other factor is related to the wages they received as the results of the competition among the small-scale foundries in paying higher wages. It often happens that the workers by themselves ask to quit working and return to their homeplace, whereas there are many orders in the foundry where they work. They return home because of the private reasons, such as wedding ceremony, funeral, mutual cooperation of their community, which could not be avoided. If one foundry have more than one person from one area, it might become a problem because this foundry might lose workers at once and can not finish the orders on time.

Thus, the non-permanent employment system is very serious problem for the foundries’ development in the future. The technical and financial assistances will be in vain if the workers are changeable because the workers’ technical skilled can not be



enhanced, so that their skill formation can not be realized.

## 6. Conclusions

Metal casting industry in Indonesia as a basic and supporting industries is still weak in technology, production facilities and managements. About 85% of total metal casting industries are small-scale enterprises facing lack of modern technology. Therefore their products are low in quality. Actually, they are still far from what is expected as an supporting industry for the machinery industries such as automotive, electrical appliance industries, etc.

Certainly, the Indonesian government's policies in promoting the small-scale enterprises in the form of clustering stemmed from the promotion policies for weaving industry in 1950s. Then the policies related to the aspect of finance started in 1973 in the form of Small-scale Investment Credit/Permanent Working Capital Credit (KIK/KMKP). However, the policies related to the metal industries appeared in 1976, in the form of deletion program of commercial vehicle. The major promotion for small-scale industrial development can be seen in the forms of subsidized credit programs and technical assistance programs. However, all the policies in promoting the small-scale enterprises were launched in the forms of decrees and programs. The Small-scale Enterprises Promotion Law was established in 1995. However, there is no Machinery Industry Promotion Law as a basis of policies and policy instruments for promoting and protecting supporting industries, including industries which producing parts and components in machinery and metalworking.

The partnership and linkage program is now being taken seriously by many large enterprises and is supported by many institutions. However, there is a challenge facing Indonesia in creating a viable and strong industrial structure. The Indonesia's industrial structure is still weak because there is a wide gap between the large and small-scale enterprises in metal industries. The development of small-scale metal foundry enterprises particularly has been hampered not only by the business climate, but also by the unstable employment system in these industries. Thus, implementation of a series of programs to promote the small-scale metal foundries will be in vain if the employment system in the small-scale metal industries is not improved.

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