

DEVELOPMENT OF RURAL MANUFACTURING SME CLUSTERS IN A DEVELOPING COUNTRY: THE INDONESIAN CASE

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Keywords

SME, SME Cluster, rural economy, success factors, Tegal metalworking industry

Abstract

Development of manufacturing small and medium enterprises (SMEs) is a key engine to promote development of rural economy in developing countries. A common industrial organization among manufacturing SMEs, especially in rural areas, in Indonesia as in many other developing countries is clustering, where firms producing similar products concentrate in a certain area. This has led the Indonesian government to adopt a clustering approach as an important element in its rural development strategy to promote the development of rural industry, which consists mainly of SMEs. The main aim of this study is to identify critical success factors of development of rural manufacturing SME clusters in Indonesia. From a number of cases, it reveals that direct government supports are not the main successful factor, or the role is minimal. Instead, the most critical ones are strong inter-firms linkages in clusters and external networks between the clusters and institutions outside the clusters, especially large enterprises (LEs), through subcontracting and traders/trading companies in urban areas. Through such external linkages, firms in clusters secure their access to a wider market.

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I. Introduction

In Indonesia, manufacturing small and medium enterprises (SMEs), i.e. firms with 100 workers or less, have historically been the main player in domestic economic activities, especially as a large provider of employment opportunities, and hence a generator of primary or secondary source of income for many households. For low income or poor farm households in rural areas, these enterprises, especially the small ones, i.e. micro enterprises (MIEs) with less than 5 workers and small enterprises (SEs) with 5 to 20 workers, are especially important. These enterprises have also been playing as an important engine for the development of rural economies and communities in the country.

Typically, SMEs in Indonesia account for more than 90% of all firms outside the agricultural sector, and thus the biggest source of employment, providing livelihood for over 90% of the country's workforce, especially women and the young. The majority of SMEs, especially MIEs and SEs, are scattered widely throughout the rural area and, therefore, they may play an important role as a starting point for development of villagers' talents, especially women, as entrepreneurs.

A common industrial organization among manufacturing SMEs in Indonesia as in many other developing countries is clustering, where firms producing similar products concentrate in a certain area. Since the adoption of clustering approach by the United Nation Industry and Development Organization (UNIDO) as its strategy to promote SME development in developing countries in early 1990s, many articles, seminar papers and books have been written on SME clusters development in these countries. Realizing how important are SMEs for the national economy and clustering as a common industrial organization among the enterprises, the Indonesian government has adopted clustering approach in the early 1990s as the national strategy for the development of SMEs in the manufacturing industry. Since then, many SME clusters have been supported by the government with various measures.

The main objective of this study is to examine the development of SME clusters in Indonesia. Its research question is what are the key success factors of SME clusters development. So, through a survey of literature (case studies) and from own field study on SME cluster development in Indonesia, this study aims to identify those key success factors.

This study is organized as follows: Section II highlights the importance of developing SMEs for rural economic development. Section III discusses the importance of clustering for rural SME development and rural development. Section IV examines the development of rural SME clusters in rural Indonesia. Through a literature review and from own field study in a metalworking industry cluster in District of Tegal, Central Java, Section V identifies key success factors. The study's conclusion is given in the final section.

II. The Importance of SMEs for Rural Economic Development

In developing countries, SMEs have a crucial role to play because of their potential contributions to improvement of income distribution, employment creation, poverty reduction, industrial development, rural development, and export growth. For this reason, governments in these countries have been supporting their SMEs extensively through many different programs, with subsidized credit schemes as the most important one. International institutes, such as the World Bank, the Asian Development Bank (ADB) and the United Nation Industry and Development Organisation (UNIDO), and many donor countries have also played a crucial role in empowering SMEs in these countries through bilateral co-operations.

The importance of SMEs for rural economic development in developing countries is widely recognized in the literature because of their characteristics, which include the following ones¹.

- 1) Their number is large, especially micro enterprise (MIEs) and small enterprises (SEs), and they are scattered widely throughout the rural areas; and therefore they may have a special "local" significance for the rural economy.
- 2) As being populated largely by firms that have considerable employment growth potential, their development or growth can be included as an important element of policy to create employment and to generate

¹ This issue is extensively discussed in, for example, Tambunan (1994), Liedholm and Mead (1999), and Berry *et al.* (2001).

income. This awareness may also explain the growing emphasis on the role of these enterprises in rural areas in developing countries. The agricultural sector has shown not to be able to absorb the increasing rural population. As a result, rural migration increased dramatically, causing high unemployment rates and its related socio-economic problems in urban areas. Therefore, rural non-farm activities, especially rural industries being a potentially quite dynamic part of the rural economy, have often been looked at as their potential to create rural employment. In this respect, SMEs can play an important role.

- 3) Not only that the majority of SMEs, especially MIEs, are located in rural areas, but they are mainly agriculturally based activities. Therefore, government efforts to support SMEs are also a way to indirectly support their agricultural sector.
- 4) SMEs use technologies that are in a general sense more appropriate as compared to modern technologies used by large enterprises (LEs) to factor proportions and local conditions in developing countries, namely quite a few raw materials being locally available and scarcity of capital, including human capital.
- 5) Many SMEs, especially medium enterprises (MEs), may expand significantly. Therefore, these enterprises are regarded as enterprises having the "seedbed LEs" function.
- 6) Although rural people are, in general, poor, many evidence show that poor villagers are able to save a small amount of capital and invest it; they are willing to take risks by doing so. In this respect, therefore, SMEs provide a good starting point for the mobilization of rural saving/investment; and, at the same time, these enterprises can function as an important sector providing an avenue for the testing and development of entrepreneurial ability of villagers.
- 7) (related to point 6) SMEs finance their operations overwhelmingly by personal savings of the owners, supplemented by gifts or loans from relatives or from local informal moneylenders, traders, input suppliers, and payments in advance from consumers. These enterprises can, therefore, play another important role, namely as a means to allocate rural savings that otherwise would be used for unproductive purposes. In other words, if productive activities are not available locally (in rural areas), rural/farm households having money surplus might keep or save

their money at their home without any interest revenue because formal banks do not exist in many rural areas. Therefore, in many cases they use their wealth to buy pieces of land, cars or houses, and other unnecessary luxury consumption goods that are often considered by villagers as a matter of prestige.

- 8) Although many goods produced by SMEs are also for the middle and to a lesser extent high-income groups of population, it is generally evident that primary products of SMEs are overwhelmingly simple consumer goods, such as cheap/simple designed clothing, furniture and other articles from wood, footwear, household items made from bamboo and rattan, and metal products. These goods cater to the needs of local low-income consumers. SMEs are also important for securing the basic need goods for poor/non-wealthy people/households. However, there are also many SMEs engaged in the production of simple tools, equipment, and machines to meet the needs of small farmers and small producers in the industrial, trade, construction and transport sectors.
- 9) As part of their dynamism, SMEs often achieve rising productivity over time through both investment and technological change; although different countries may have different experiences with this, depending on various factors. The factors may include the level of economic development in general and that of related sectors in particular; accessibility to main important determinant factors of productivity like capital in particular, technology and skilled manpower; and government policies that support development of production linkages between SMEs and LEs as well as with foreign direct investment (FDI).²
- 10) As often stated in the literature, one advantage of SMEs is their flexibility relative to their larger competitors. In Berry *et al.* (2001), these enterprises are construed as being especially important in industries or economies that face rapidly changing market conditions, such as the sharp macroeconomic downturns that have bedeviled many countries in Southeast Asia, including Indonesia, over the past few years.³ .

² In developing countries, LEs achieve productivity increases to a great part by borrowing from the shelf of technologies available in the world. Such as FDI, technology licensing, joint ventures, and access to engineering and other advances provide productivity increases for LEs. This is not evident for the majority of SMEs (Berry, *et al.*, 2001).

III. The Importance of Cluster for the Development of Rural SME and Rural Economy

A common industrial organization among manufacturing SMEs in developing countries is clustering, where firms producing similar products concentrate in a certain area. The United Nation Industry and Development Organization (UNIDO) defines a cluster as a local agglomeration of enterprises, producing and selling a range of related or complementary products within a particular industrial sector or subsector (Richard, 1996). One example is a localized knitwear and garment industry which includes within a small geographical region knitting firms, cloth-finishing, dyeing, and printing enterprises, garment producers, merchant buyers and exporters, and also producers of specialized inputs such as thread, buttons, zips, and even possibly chemical treatment as well. However, there are also many clusters less specialized and developed than this, for example a local agglomeration of small metal working enterprises producing a range of metal products and repair services for broadly the same markets, and having only competitive relations with each other (Tambunan, 1997).

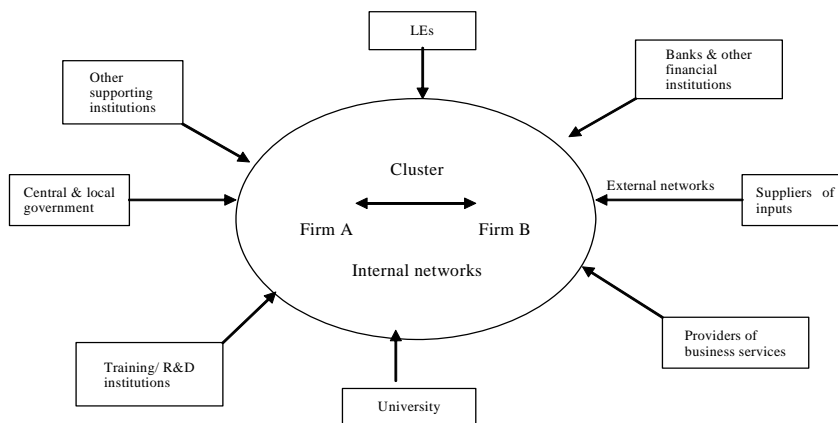
In its traditional form, clustering refers to the process in which geographically proximate producers, suppliers, buyers, and other actors develop and intensify collaboration with mutually beneficiary effects. However, in its most advanced form, according to a widely accepted definition proposed by Porter (2000), a cluster is a geographically proximate group of interconnected enterprises and associated institutions in a particular field, linked by commonality and complementarity. Under this definition, a cluster may include suppliers of inputs, or extend downstream to regular buyers or exporters. It also includes government institutions, business associations, providers of business services and agencies that support clustered enterprises in such fields as product development, production process improvement, technology, marketing information (for example, on new market and designs), vocational training, and so on.

³ It appeared that when the economic crisis hit the country in 1997-98, SMEs have been weathering the crisis better than LEs, because their greater flexibility allows them to adjust production process during the crisis; although many of them had been hit hard too. Many argue that being less reliant on formal markets and formal credit, SME are able to respond more quickly and flexibly than LEs to sudden shocks (Berry, *et al*, 2001).

Clustering creates external economies and joint actions and increases scope. In effect, individual enterprises in a cluster can gain collective efficiency. Close proximity facilitates the establishment of business networks by enterprises in the locality of industrial links without substantial transaction costs or difficulties. However, these economic advantages can only be achieved when the cluster has well-developed internal and external networks. Internal networks can be defined as business co-operations or links among enterprises inside the cluster, which can be in various forms, for example marketing, distribution, production, procurement of materials, training for workers, etc. External networks are business and other forms of relation between enterprises inside the cluster and actors outside the cluster such as LEs, suppliers of inputs, providers of business services, and so on (Ceglie and Dini, 1999) (Figure 1).

Based on the experience of UNIDO in many developing countries, Ceglie and Dini (1999) state that collaborative actions through well developed business networks involving SMEs and LEs, suppliers of inputs, providers of business services, financial institutions, other supporting private and public agencies, and local and regional governments offer new opportunities for developing specific location advantages and competitive strengths of clustered SMEs. In addition, business networks among enterprises and with other actors mentioned above also give rise to a collective learning space, where ideas are exchanged and developed and knowledge shared in a collective attempt to improve product quality, upgrade technology and move to more profitable market segments (ADB, 2001).

FIGURE 1. An illustration of internal-networks inside and external networks of a cluster



In the era of world trade liberalization and economic globalization, where competition becomes heavier and where two critical factors determining the global competitive edge are the mastery of technology and highly skilled human resource, businesses of all scales will face challenges as well as various kinds of problems. Considering the weaknesses such as limited funds, lack of experts, and poor technological mastery and business knowledge, particularly on global market, this is especially true for rural SMEs in Indonesia as compared to LEs in almost all aspects related to business development.

In this era, great demands are made on the ability of rural SMEs to improve their efficiency and productivity and to adapt to and be flexible as regards market, product, technology, management and organization. As the era generates larger market opportunities, individual SMEs are often unable to capture these opportunities that require products with better quality and competitive prices and good services after sale, larger production quantities (economies of scale), products' homogeneous standards and regular supply. Many SMEs in Indonesia, particularly those located in rural/backward areas, experience difficulties in meeting these requirements, and they also constitute a significant obstacle to internalize functions such as training, market intelligence, logistics and technology innovations in product as well as production process/method. All these difficulties can also prevent the achievement of a specialized and effective inter-firm division of labor, all of which are at the very core of firm dynamism (ADB, 2001).

Experiences in many developed countries show that clusters can be a powerful means for SMEs to overcome the above constraints and succeed in an ever more competitive market environment. Base on empirical findings in many European countries, Richard (1996) argues that "*The European experience seems to suggest that SMEs might not be at a disadvantage at all compared to larger firms, as long as they were able to benefit from the advantages of clustering*" (page 4). Through clustering and networking, individual SMEs can address their current problems related to size, production process, marketing and distribution, procurement of raw materials and other inputs, risks associated with demand fluctuations, and market information and can improve their competitive position. Through a co-operation of enterprises in a cluster, SMEs may take advantages of external economies: presence of suppliers of raw materials, components, machinery and parts; presence of workers with sector-specific skills; and presence of workshops that make or service the machinery and pro-

duction tools (Humphrey and Schmitz, 1995). A cluster will also attract many traders to buy the products and sell them to distant markets. Buying large amount from many producers in the clusters through a single visit reduces transaction costs (Berry, et al., 2001). Also, with clustering of enterprises, it becomes easier for the government, LEs, universities/research institutes, and other development supporting agencies to provide services, such as technical development and management training, and general facilities such as a large machinery for raw material drying and processing into half-finished goods. The services and facilities would be very costly for the providers if they are given to individual enterprises in dispersed locations (Tambunan, 2000, Humphrey and Schmitz, 1995).

Cluster development is important for the development of not only rural SMEs but also rural economy. This is supported by various case studies in Indonesia. For instance, Weijland (1994, 1999) pointed out that rural clusters in Indonesia have a “seedbed” function for the development of rural SMEs in particular and rural industry in general, meaning that clusters are the places for potential rural entrepreneurs to develop by working together among them. Also, clustering can improve the networks of rural producers to outside markets through dense networks of traders. Klapwijk (1997) analyzed data on 400 rural manufacturing SME clusters in Central Java which hold a dominant status in the food, beverage, and tobacco industries. He argues that SME clusters are important for the development of rural industries because productivity in clusters appears to be higher than in dispersed enterprises. One of the main reasons is that clustering stimulates active involvement of traders and LEs in agglomeration of SMEs. Sandee (1994, 1995, 1996) shows that rural enterprises in clusters are in a better position to adopt innovations in products as well as production process than dispersed enterprises.

Based on evidence from their field studies on SMEs in rural West Java., Smyth (1990, 1992) described how clustering of rattan furniture producers has absorbed an entire village in Tegal Wangi, West Java, and created numerous satellite small-scale industrial activities in neighboring hamlets. Schiller and Martin-Schiller (1997) also provide the same evidence from wood furniture producers in Jepara in Central Java. The growth of this cluster in the 1980s had transformed the town into a thriving commercial center with a five-mile avenue filled with commercial amenities such as furniture showrooms and factories, modern hotels, new commercial banks, supermarkets, telephone

and fax stalls, and European restaurants. Soemardjan (1992) also presented an interesting story on how the development of a roof tile cluster in a small village in Bali has turned poverty in the village into prosperity.

IV. Development of Rural SME Clusters in Indonesia

In Indonesia, SME clusters are observed mainly in rural areas, although many are close to big cities like Jakarta, Surabaya, Yogyakarta and Semarang. Most clusters were established naturally as traditional activities of local communities whose production of specific products have long been proceeding. Based on comparative advantages of products they made, at least with respect to the abundance of local raw materials and workers who have special skills in making such products, many of these clusters have a large potential to grow. Take for example the clusters of batik producers that have long been existence in various districts in Java (for example, Yogyakarta, Pekalongan, Cirebon, Surakarta and Tasikmalaya).

As shown in Table 1, clusters in Indonesia can be classified into four (4) types according to their level of development, each with its own characteristics (Sandee and ter Wingel, 2002). The first type of clusters dominated clusters in Indonesia (roughly speaking more than 90%), indicating that the process of clustering in the country is still at an infant stage. Such clusters can be classified as “survival” clusters of MIEs, as this type of cluster displays many characteristics of MIEs with level of productivity and wages being much lower than that of SMEs. In these clusters the degree of inter-firm cooperation and specialization is low, reflecting the lack of specialists in the local labor force as well as a fragile social fabric. The process of clustering of this type is still at an infant stage, as many of the clusters are stagnated in the sense that for many years there has hardly been any development in terms of market expansion, increased investment and size of production, improved production methods, management and organization, and product development (ADB, 2001). Sandee and ter Wingel (2002: 13) argue that artisanal clusters are characterized by lack of change through time: the producers produce the same products, with the same technology that are sold to the same local markets as decades ago. But, they still exist because there is still a market for their products, mainly from the lo-

cal demand from low-income households.

The second type developed rapidly in terms of skill improvement, technological upgrading, and successful penetration of domestic and export markets. The active clusters may still be artisanal in character, which still face quality-related problems, and their markets are mainly local or domestic. Typical examples of these clusters are roof tile clusters, metal-casting clusters, shuttle-cock clusters, shoe clusters and brass-handicraft clusters. In these clusters, some enterprises start to influence the development trajectory of the clusters, and some enterprises produce for export through middlemen or traders or trading houses from outside the clusters.

TABLE 1. Different Types of Clusters in Indonesia

No	Type	Characteristics
1	“Artisanal”	Mainly MIEs, low productivity and wage; stagnated (no market expansion), increased investment and production, improved production methods and management, organization and production development, local market (low-income consumers) oriented, used primitive or obsolete tools and equipment, many producers are illiterate and passive in marketing (producers have no idea about their market); the role of middlemen/traders is dominant (producers are fully dependent on middlemen or traders for marketing); low degree of inter-firm cooperation and specialization (no vertical co-operations among enterprises); no external networks with supporting organizations.
2	“Active”	Used higher skilled workers and better technology; supplied national and export markets; active in marketing; the degree of internal as well as external networks is high
3	“Dynamic”	Trade networks overseas are extensive; internal heterogeneity within clusters in terms of size, technology, and served market is more pronounced; leading/pioneering firms played a decisive role.
4	“Advanced”	The degree of inter-firm specialization and cooperation is high; business networks are well developed between enterprises with suppliers of raw materials, components, equipment and other inputs, providers of business services, traders, distributors, and banks; cooperation with local, regional or even national government, as well as with specialized training and research institutions such as universities is good; many firms are export-oriented (mainly through trading houses or exporting companies).

Examples of the third type are textile weaving clusters in Majalaya and Pekalongan, furniture cluster in Jepara, wig and hair accessories cluster in Purbalingga, and handicraft cluster in Kasongan. Many producers in these clusters have developed extensive trade networks not only at home but also overseas. Internal heterogeneity within clusters in terms of size, technology, and served market is more pronounced. Inter-firm specialization and cooperation among firms inside clusters are well developed. One of the most striking features of this type (and also to a certain extent in the “active” clusters) may be the decisive role of leading/pioneering firms, usually larger and faster growing firms, to manage a large and differentiated set of relationships with firms and institutions within and outside clusters. Some leading firms have utilized cutting-edge technologies in production (Supratikno, 2002a). Examples are clove cigarette cluster in Kudus, tea-processing cluster in Slawi, and tourism cluster in Bali. In the case of clove cigarette cluster in Kudus, their products are able to outperform products from Philip Morris and BAT. Similarly, tea-processing cluster in Slawi, led by a big company named Sostro, has grown up as the market leader in the Indonesian soft drink market, leaving a giant Coca Cola behind (Supratikno, 2002a).⁴ Some other leading firms in active and dynamic clusters are presented in Table 2. Interestingly, in some cases, such as in furniture cluster in Jepara and handicraft cluster in Kasongan, there are considerable direct investments made by foreign immigrants (Supratikno, 2002b).⁵

TABLE 2. Leading Firms in Some Active and Dynamic Clusters

Cluster	Location	Leading Firms*
1. Wig and hair accessories	Purbalingga (Central Java)	PT Royal Korindah, PT Indo Kores
2. Handicraft	Kasongan and Sleman (Yogyakarta)	PT Out of Asia
3. Textile weaving	Pekalongan (Central Java)	PT Pismatex
4. Furniture	Jepara (Central Java)	Duta Jepara, Grista Mulya, Satin Abadi
5. Brass handicraft	Juwana (Central Java)	Krisna, Samarinda
6. Roof tile	Kebumen (Central Java)	Mas Sokka

Note: *) PT means a limited corporation

Source: Supratikno (2002b).

⁴ Schmitz and Nadvi (1999) provide some examples of advanced export-oriented clusters in other developing countries including shoe manufacturing in Brazil, India and Mexico, surgical instruments in Pakistan, and garments in Peru.

⁵ Foreign immigrants who established production facilities have contributed significantly to the clusters' dynamics. They are clearly in advantageous position vis-a-vis local producers in the clusters, as these foreign immigrants have better accesses to market, technology, and financing sources (Supratikno, 2002a).

With respect to the fourth type, only a very few clusters can be included in this category, namely clusters that are more developed and have become more complex in structure than those in the third type. The main characteristics of this type of clusters that make it different from the third type are especially in the following areas. The degree of inter-firm specialization and cooperation is high, and enterprises in these clusters have developed business networks with suppliers of raw materials, components, equipment and other inputs, providers of business services, traders, distributors, banks and other supporting institutions. This type of cluster has good cooperation with local, regional or even national government, as well as with specialized training and research institutions such as universities. Within this process, the clusters may also expand geographically, e.g. by regularly drawing on inputs from a nearby region, or developing regular cooperation with a university or research institution in another city. Many enterprises in this type of clusters are export-oriented. However, most of them do export indirectly through trading houses or export companies (ADB, 2001).

Moreover, advanced clusters often overlap and interlink with other clusters in the same region. Such cluster agglomerations, or often-called industrial districts (the Italian term), form the most complex form of clustering, where different sectors or sub-sectors mutually depend on and benefit from each other. Prominent examples of cluster agglomerations include North-Central Italy (tourism, food industry, fashion industry, furniture industry and machinery industry), southern Germany (vehicle, electronics, machinery, and software industries) and Greater London (banking, insurance, software, publishing, film and music, tourism, fashion industry, advertisement, business services). In Indonesia, one example of cluster agglomeration is the Yogyakarta-Solo area with its tourism, furniture and interior decoration, metal processing, leather goods and textile/clothing clusters, which all mutually benefit each other.

Various studies attest to the importance of clustering not only for the development of SMEs in the clusters, but also for the development of villages/towns where the clusters are located. From her field studies in rural Java, Smyth (1990, 1992) described how clustering of rattan furniture producers has absorbed an entire village in Tegal Wangi, West Java, and created numerous satellite small-scale industrial activities in neighboring hamlets. Schiller and Martin-Schiller (1997) also provide the same evidence from wood furniture producers in Jepara in Central Java. The growth of this cluster in the 1980s had

transformed the town into a thriving commercial center with a five-mile avenue filled with commercial amenities such as furniture showrooms and factories, modern hotels, new commercial banks, supermarkets, telephone and fax stalls, and European restaurants. Soemardjan (1992) also presented an interesting story on how the development of a roof tile cluster in a small village in Bali has turned poverty in the village into prosperity.

V. Key Success Factors

1. Evidence from literature

From their studies on clusters development in both developed and developing countries, Schmitz and Musyck (1994) conclude that successful SME clusters share six (6) common characteristics that relate to market, specific knowledge and skill of entrepreneurs and their workers, internal organization, the role of self-help organizations and common service facilities, the quality of local government support, and networking with local providers of education and technology.

Based on his own research on some clusters in rural Central Java, Supratikno (2002a) argues that *successful Indonesian clusters seem to support these characteristics, with extra weights should be given to the market-related conditions and the pace of technological upgrading. The growing market condition justifies new needed investment, whereas the latter enables firms to serve more demanding segments* (page 10). So, it can be argued that these characteristics are the critical factors for successful cluster development.

Sato (2000) gives a good example of successful development of SME clusters, even without direct government supports, from her study on a rural cluster consisting of over 300 SMEs in metal working and machinery component industry in Ceper (Central Java). She concludes that subcontracting with urban LEs and combination with high market diversification were two key success factors for this cluster.

From their study on a cluster of metal casting industries producing components and spare parts in Cibatu village in Sukabumi (West Java), Sandee *et al* (2002) also provides evidence showing how important it is to have a wider

market linkage for a successful cluster. This cluster is characterized by dependency on buyer or order-driven development processes: individual buyers, traders or LEs play key roles in all aspects of the business, from the design of products, determining order and what products will or should be made to market outlets. This is valid for both the domestic and export markets. This nature of business makes it impossible to produce for stock. Firms in the cluster do not have a joint strategy to search for a new market outside their present networks. It can be said thus that these buyers, traders and LEs are the main agents of change in the cluster. Big national and international companies such as P.T. ASTRA International (Toyota automobile manufacturing), United Tractor Engineering Komatsu, and Sanwa have placed orders with the cluster on a regular basis. Most of these companies have also played a role in upgrading the skills of entrepreneurs and workers. P.T. ASTRA International has been one of the main actors for the development of the cluster through its various companies by providing such assistance as venture capital, loans, grants, technical trading, skills development and support for technological upgrading.

Others such as Knorringa and Weijland (1993), Tambunan (1999, 2002) and ADB (2001) conclude that lack of access to market and lack of continued supply of raw materials, often caused by market distorted policies, are the key factors for the failures of many SME clusters. For example, government-sponsored nucleus-estate programs that developed small-scale agricultural producers around large-scale external processing units proved to be successful in many rural areas outside Java. However, when the concept was implemented on Java, it failed. Due to lack of sufficient raw material supply, export-oriented medium-scale processing units, such as baby corn canning in Sukabumi or pineapple juice concentrating in Subang that had been built with considerable government subsidies, had to be closed shortly after starting operation. The reason for this lack was that local primary producers supplied only factories that were already successfully linked to the growing and highly attractive fresh product markets of Java's urban centers that paid better prices (ADB, 2001).

According to ADB (2001), neglecting or even eroding SME's potential self-organization is also a reason for the failure of many rural clusters. Strong and active self-help organizations of cluster members facilitate collective learning, and strategic orientation processes can play an important role in developing new markets and supply channels. They are indispensable for implementing advanced cluster development strategies comprising collective branding, stand-

ardization and distribution, collective interest representation against monopolistic client structure, or enforcement of quality standards on input suppliers. Moreover, with public support to SME clusters development often restricted to specific impulse programs, the task of sustaining long-term SME clusters development usually falls on cluster members and their self-help organizations.

From his most recent study, Supratikno (2002b) notes that some SME clusters that were prospering in the past under the facilities assistance from the government are now struggling. Various reasons have been expressed by the clusters' producers, such as the frequent increases in the prices of raw materials and gasoline, minimum wage level and taxes, highly important contents of the products that led to the high import costs in rupiah due to the currency's weakness against US dollar, and heavy burden from bureaucratic red tapes. This report suggests that an inappropriate macroeconomic policy that has created an "unfriendly" business environment is also a reason for the failure of many clusters despite direct supports from the government.

Weijland (1994), Sandee (1994, 1995, 1996) and Berry et al, (2001) argue that linking rural SME clusters to nearby urban or even international markets through subcontracting arrangements is a key success factor. They find that within rural SME clusters, productivity appears to be higher in urban linked-clusters than those in isolated rural areas. In the literature, it is often suggested that technology upgrading is a very important factor for productivity growth, and Berry et al, (2001) argue that technological change is more likely when the rural clusters are linked to urban or international markets.

Another interesting case of having a wider (including export) market link as a key success factor for rural cluster development is from Sandee et al. (2000). They studied furniture manufacturers in the district of Jepara (Central Java), which is a very large furniture industry cluster. They estimated that in the mid-1990s the cluster employed over than 40,000 permanent workers in more than 2,000 SEs and 100 LEs, and MEs scattered across 80 villages. The firms in the cluster are important both for the domestic and the export markets. They act as subcontractors and are involved in production networks managed by LEs and traders. About 30% of the value added is directed toward the domestic market, mainly supplied by SEs where the technology is relatively basic. Many producers in the cluster can now more often produce for stock without bearing the risk of changing consumer tastes. Furniture for the domestic markets is sold through a network of furniture shops throughout Java.

2. Evidence from Tegal Metalworking Industry Cluster

The district of Tegal (*Kabupaten Tegal*), hereinafter Tegal, is part of the provincial government of Central Java located at the northern shore near the north coast of West Java connected with key trucking and rail routes. Tegal is among few areas in Indonesia with a long history of development in the metalworking industry. It has been a metalworking center since the mid-1800s when it was the locus of several sugar processing factories and related enterprises including locomotive repair shops and metal processing factories. In the beginning of the 1980s, the first subcontracting activity started in the district, sparking government activity to develop the metal working industry in the country.

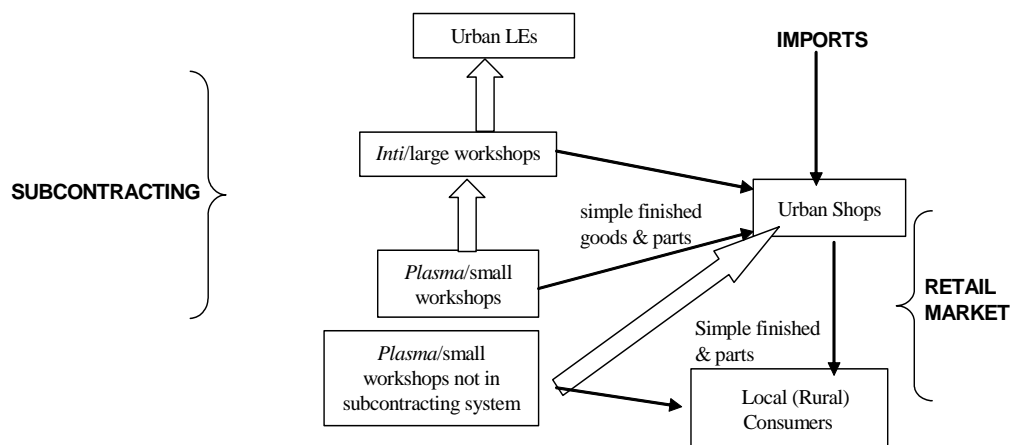
The Tegal metalworking industry cluster has about 30,029 workers out of 118,820 workers, or approximately 25 % of total workers employed in the district's industrial sector. There are around 2,811 metal workshops in the cluster, or about 10% of the total number of local enterprises in non-farm sectors. The majority of metal workshops are small, employing less than 20 workers, mainly male.

Although metalworking involves a range of processes, the sector is dominated by the plate forming business. Their comparative advantage has been in filling small orders for simple metal products or components, mostly for household appliances and handicrafts, but also for furniture, and, to a lesser extent, for parts and components for the general machinery and automotive industries. The small size of workshops gives them greater flexibility, and Tegal's abundant cheap labor can outweigh the productivity advantages of more capital-intensive production. There is often intense price competition between workshops.

The structure of the value chain of the Tegal metalworking industry cluster is illustrated in Figure 2. According to the size of production and level of production sophistication, there are two types of workshops in the Tegal metalworking industry cluster: *inti*, mainly MEs, and *plasma*, mainly SEs and MIEs. *Inti* workshops receive orders for metal components mainly from urban-based big companies outside the district. During the survey in 2005, there were several big companies which subcontracted work to firms in the cluster, including PT Komatsu Indonesia Tbk, PT. Daihatsu, and some divisions of the Astra Group such as PT. Sanwa, PT Kubota, and PT. Katshusiro. These companies often source metal components from several parts of the country, mostly

in West Java. Among these companies, the most prominent one is PT Komatsu Indonesia Tbk (hereafter KI), which is a subsidiary of a Japanese company, and it has established subcontracting production linkages with firms in the cluster since 1998. This company produces various equipment for construction and mining activities under the global trademark of Komatsu, such as hydraulic excavators, bulldozers, motor graders, frames and related components, steel cast products as well as off-highway dump trucks. This case study focuses only on KI and its local subcontractors: family members (mainly men) as unpaid workers (helpers), and the owner passes basic metalworking skills on to his employees, leaving the technical capacity of the workshop highly dependent on the technical capacity of the owner. *Inti* workshops often subcontract part of their production to *plasma* workshops. So, there are not only external linkages between SMEs in the cluster and urban LEs, but also inter-firm linkages inside the cluster.

FIGURE 2. Structure of the Value Chain of the Tegal Metalworking Industry Cluster



Plasma workshops usually hire cheap, unskilled laborers and employ local workshops which have no subcontracting businesses with other firms manufacture entirely for the wholesalers and retailers, mainly in nearby cities, or sell their products directly to local consumers. Many wholesalers and retailers purchase goods from Tegal metal workshops for resale in stores in cities around the country.

To become subcontractors, local firms must prove that they have the capacity to produce high-quality components and meet the stringent delivery

times. An audit determines if they have the required machinery, manpower,⁶ facilities, legal standing⁷ and use of ISO standards.⁸ After that, then they are requested to produce a sample component from provided technical drawings. According to KI's *inti* workshop owners interviewed, before an agreement is signed, KI often ask for a trial run of the mass production process, subjecting the output to quality control tests. If they could produce a certain product item on a regular schedule and consistent quality, they would then be granted a license for manufacturing different product items, thereby expanding their product lines. In the last 2 years, many suppliers have been tested through a few initial batch orders, but, in the end, only four local enterprises were able to meet KI's satisfaction; two of them were included in the sample.⁹

During the survey, it was found that MEs are more able than SEs and MIEs to meet such requirements. Only some MIEs have indirect subcontracting with LEs through *plasma* relationship with *inti* subcontractors. From interviews with owners of MIEs, lack of capital, limited skill, and no access to information appeared to be the three most important constraints. They did not have enough money to purchase the required machinery and to hire many workers (generally, MIEs are self-employment units without helpers or hired workers). They often use second-hand or homemade equipment. If they hire workers, often low-skilled workers with little or no experience, they rely on shop owner's technical knowledge.¹⁰ Since many MIE owners built their expertise through working in

⁶ They must have enough manpower to have two shifts for higher productivity.

⁷ KI as many other LEs require their subcontractors to be a P.T.(Limited Liability Company) not a C.V. (a Limited Partnership not involving a legal person, and personal assets are liable for obligations).

⁸ KI as many other LEs require the use of ISO standards even if the workshop is not officially certified.

⁹ The two interviewed *inti* subcontractors, PT Prima Karya (PK) and PT Karya Padu Yasa (KPY), said that past reputation and personal network was also a critical factor for their successful bid to become subcontractors. However, they have insisted that the opportunity to become KI subcontractors was open for every workshop in the cluster as long as they can prove themselves to have capability to meet the quality requirements asked by KI. KI has periodically opened competition for new *inti*.

¹⁰ Cheap labor and relatively small, shifting job orders reduce incentives for them to specialize or acquire expensive machineries to increase productivity. As one seasoned metal worker explained, the strength of the *plasma* workshop is the flexibility to do smaller orders. However, this flexibility becomes a liability to capacity devel-

small shops and rarely had formal academic training, they have difficulty reading technical drawings and instead rely on copying samples, leading to less accurate output. So, they lack the technical ability to produce complicated components with the precision required by LEs. Also, due to lack of information and no skill, they did not know how to meet ISO standards. They said that they could not expect too much from the government. The government did give some information, but they need direct assistance too.

After winning a contract, an *inti* subcontractor has access to a significant level of technical training. According to a subcontractor of KI, trainings directly addressed the technical needs of the workshop in meeting the production requirements of KI. Indonesian experts from the Jakarta KI office leading the training used a teaching style that clearly delivered the necessary knowledge and emphasized practical application, with 90% of training time spent in hands-on experience. Trainers also help the workshop identify problems and troubleshoot.

Overall, this case study suggests that having subcontracting arrangements with urban-based firms or long-term stable linkages with urban traders is a key determinant factor for rural SME clusters to survive. Although such stable linkages do not necessarily lead to higher profitability for rural SMEs, the linkages keep them in operation. At least from this Tegal case, no evidence was found on bankruptcy among SMEs doing subcontracting activities with urban firms or having commercial linkages with urban traders. With these ways, rural SME clusters have also access to wider markets. It also suggests that foreign direct investment (FDI)-based companies can act as an important growth engine for rural SME clusters. Through subcontracting with firms in the clusters, they generate not only wider market opportunities for rural SME clusters but also help rural SMEs to upgrade their technological capabilities and hence to improve their performance.

opment when workshops must fill many small orders and never develop specialization that leads to expanded command of technology.

VI. Concluding Remarks

In Indonesia, manufacturing SMEs are very important as a key engine for rural development. A common industrial organization among manufacturing SMEs, especially in rural areas, in Indonesia as in many other developing countries is clustering, where firms producing similar products concentrate in a certain area. The Indonesian government, therefore, has been actively promoting many rural SME clusters scattered around the country as an important element in its rural development strategy. It has provided technical and financial support and, in particular, it has developed a common service facility offering access to expensive equipment for many rural SME clusters. The government has also stimulated state-owned enterprises to become actively involved in the development of the cluster through the foster parent (*Bapak-Angkat*) scheme.

Almost all existing case studies suggest that government supports are not the main successful factor or the role is minimal for clusters development. There are many clusters that face difficulties to survive despite government supports, while there are also many examples of successful development of SME clusters without government facilities. Through a review of existing case studies and from the case study of Tegal metalworking industry cluster, this paper identifies urban and international market links and stable long-term supply of necessary inputs as the key success factors for rural SME development. With respect to the market links, subcontracting production linkages with urban LEs/FDI-based companies is one way to facilitate it.

This implies that, in essence, most failures of government supports can be attributed to the fact that these critical factors for successful cluster development were either not existing or not addressed correctly. The government often focuses on providing assistance, such as technical assistance, training and subsidized credit schemes, but it is too oriented on standardized instruments rather than diagnosing each cluster's specific potential and constraints. Consequently, the supported clusters' existing and potential market linkages were often neglected in project design.

Another important finding from the Tegal case is that the technical capability of rural SMEs is generally low, especially SEs (including MIEs). With their current condition (e.g. lack of skilled workers and basic technology), SEs are not able to match necessary conditions required by LEs/MNCs.

Consequently, as rural development proceeds and subcontracting activities expand into rural areas, the development gap between MEs and SE will widen. Thus, the main policy implication of this is that the emphasis of specially designed SME development programs must be on supporting capacity building in SEs. The local private sector such as university, R&D institutes, banks and other non-government organizations can play a very important role in this task.

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