# Success Factors for the Development of Micro, Small, and Medium Industrial Clusters in Indonesia

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## Abstract

*Since the 1970s, the Indonesian government has seriously focused on developing MSMEs with various programs and facilitation, including facilitating existing MSME industrial clusters. The main objective of this article is to examine the development of MSME industrial clusters in Indonesia using the latest available data. This study focuses on analyzing the development of the MSME industrial cluster in Indonesia, the main problems, and determining factors for the success of developing an MSME industrial cluster in Indonesia. The study analyzes secondary data from Indonesia's National Agency of Statistics and reviews critical literature on developing MSME industrial clusters in Indonesia. The findings of this study show that the number of MSME industrial clusters is concentrated on the island of Java, where more than 50% of the population is located, and is the most advanced region in economic development and industrialization in Indonesia. According to industry groups, the most numerous MSME clusters are in the food and woodworking industries. Second, many MSME clusters still need to receive guidance from the government. In many cases, government policies supporting the development of cluster MSMEs through a clustering approach have been unsuccessful. Third, most of the MSME industrial cluster comes from "artisanal" circles dominated by micro-enterprises (MIEs).*

**Keywords**: Indonesia, Micro, Small and Medium Sized Enterprises, Success Factors.

## Introduction

In Indonesia, micro enterprises (MIEs) are enterprises with an asset value of up to 50 Indonesian Rupiah (IDR) and an annual sales value of not more than 300 million IDR; small businesses (SEs) are enterprises whose asset value is between more than 50 million IDR to 500 million IDR, and annual sales value between more than 300 million IDR to a maximum of 2.5 billion IDR; and Medium Enterprises (MEs) are companies with a net worth of between more than 500 million IDR and a maximum of 10 billion IDR, and an annual sales value of more than 2.5 billion IDR to 50 billion IDR. Meanwhile, the Central Statistics Agency (BPS) uses the number of workers as a criterion, namely as follows:

- MIE is a company without workers or with a maximum of 4 workers.
- SE is a company with several employees, between 5 and 19 people.
- ME is a company that employs a minimum of 20 and a maximum of 99 people.
- Large companies (LE) are companies with more than 99 employees.

The Indonesian government recognizes that MSMEs have a vital role in the country's economy, not only because they dominate the number of enterprises but, more importantly, they are the largest generator of employment and the most significant contributor to GDP. These enterprises also have high resilience in previous crises, including the Covid-19 pandemic. The high strength of MSMEs has played a role as a cushion for the economy because of their ability to survive periods of pressure and grow back faster and higher after stress. Unfortunately, even though the government recognizes its strategic role in the national economy, it faces various

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problems, including the lack of access to bank loans and difficulties in the procurement of raw materials and in selling its products.

Realizing this, the Indonesian government has taken many concrete actions to facilitate the development of MSMEs on the one hand and help them overcome their various obstacles on the other hand. These actions include issuing multiple regulations in the last two decades, especially assisting MSMEs in the areas of distribution and marketing, raw material procurement, and adoption of new technology, including digital technology, as well as financing by launching People's Business Credit (known as KUR) in 2007, i.e., cheap credit scheme with total government financing, and without collateral (Tambunan, 2018).

There are 5 (five) Priority Programs (PP) in the 2020-2024 National Medium-Term Development Plan (RPJMN) related to the industrial sector which are accommodated in the Strategic Plan of the Ministry of Industry for 2020-2024. One of these PPs is strengthening entrepreneurship and MSMEs, especially in the manufacturing industry. Law Number 03 of 2014 concerning Industry describes the manifestation of the Strengthening Program of Industrial MSMEs, among others, through the development of MSMEs industrial clusters through many measures, whose primary purpose is to accommodate a group of MSMEs that manufacture similar products, use similar raw materials, and carry out the same production processes. These steps include various cheap, subsidized credits, human resource development, ISO quality management systems, entrepreneurship programs such as incubator systems, partnership programs between MSMEs and LEs, vocational training for workers and owners of MSMEs, and Technical Units in clusters in the form of various machines. Certain products can be shared by producers in the group (Dhewanto et al., 2013). Through the construction and development of MSME industrial clusters, MSMEs' coaching, empowerment, and capacity building can be carried out more effectively, efficiently, and optimally than if the MSMEs are spread outside the cluster.

With the above background, the main objective of this article is to examine the current development of MSME clusters in the manufacturing industry in Indonesia. This study has two research questions. First, how is the performance of the MSME industrial cluster in Indonesia? Second, what are the most crucial factors determining the success of developing MSME industrial clusters in Indonesia?

For this purpose, the structure of this paper is as follows:
1. It deals with the concept and definition of the MSME cluster.
2. Based on a literature review, it identifies factors that are considered crucial in determining the success of developing an MSME industrial cluster.
3. It discusses the development of the MSME industrial cluster in Indonesia.
4. A conclusion is drawn.

## Methodology

This study is based on descriptive analysis. It analyses national data on MSMEs in the manufacturing industry 2020 from the National Survey on Micro and Small Industry and MSME industrial Centers in Indonesia 2020 from the Directory of Indonesian Industrial Centers. It also reviews empirical studies in other countries and other relevant literature.

## Concept and Definition

There is quite a lot of literature on clusters, including articles from Porter (1998), Porter and Ketels (2009), Rosenfeld (1997), Schmitz (1999), Altenburg and Meyer-Stamer (1999), Altemburg (2001), Hoen (1999, 2001), and Tambunan (2008). However, it doesn't seem easy to get a single formal definition of the industrial cluster concept from them. The cluster concept offered in this literature is more complex than just a business network developed by several companies operating in the same market, which are part of the same industry and cooperate in

many ways, such as raw material procurement, marketing and distribution, and research and development (R&D). Many researchers agree that an industrial cluster consists of many companies, primarily MSMEs, in the same industry or sector or carrying out related productive activities in the same geographic area. Several other authors argue that industrial clusters include institutions that interact with several firms making the same product, influencing their competitiveness and performance (see literature review by Vargas-Hernández, 2020).

Industrial centers referred to by BPS (2021). are locations for concentrated industrial activities that generally manufacture similar products, use similar raw materials, and carry out the same process of production, equipped with supporting facilities and infrastructure designed based on the development of regional resource potential, as well as managed by professional management or known to the surrounding community as an industrial center. The Sentra name is named with the main product's name (specialization)—examples: Shoe Center, Batik Center, Pottery Center, Tempe Center, etc. The main product is the goods/services most businesses produce in the industrial center of its principal activity. The main activity is the type of business activity that is determined based on:

1. Activities with the most outstanding production/revenue value.
2. If the value of production/income is the same, then the main activity is determined from the most significant production/sales volume.
3. If the production/revenue value and production/sales volume are the same, then the main activity is taken from the most time used.
4. If the value of production/revenue, volume, and time are the same, then determining the main activity is based on the respondent's statement.

Scope of industrial centers (BPS, 2021): (a) territory delimitation: village; and (b) meets one of the following criteria: (i) there is organization/guidance from ministries/agencies/services; (ii) known by the public; and (iii) the minimum number of similar businesses in a village is 20 percent of the number of households in the village

Whereas, according to the Indonesian Ministry of Cooperatives and SME, an industrial cluster is a group of production activities consisting of a variety of industrial groups, i.e., core industries (for instance, car assembly), related industries (e.g., firms producing components and spare parts), supporting initiatives (e.g., firms manufacturing auto glass and electrical equipment), and other funding and related economic activities (e.g., advertising or marketing companies), whose actions will be interrelated and mutually supportive.

**Critical Success Factors**

Grouping companies in an industrial cluster creates external benefits or economies (which are beyond the control of individual companies) that lower company costs and increase the productivity and competitiveness of the group. Apart from that, grouping also creates joint action or cooperation between companies and expands scope, which makes the simultaneous manufacturing of different products more cost-effective than manufacturing them on their own. As a positive impact, each company in the cluster gains collective efficiency, which is impossible to obtain by producing individually. Joint efficiency is one of the determining factors in an industrial cluster's competitiveness and sustainable development. The clustering or proximity between companies facilitates the formation of their business networks without significant transaction costs or difficulties. However, this economic advantage can only be achieved if the companies in a cluster have good internal and external networks or cooperation. Internal networks are business collaborations or links between companies in a group, which can take various forms, for example, procurement of materials, worker training, innovation, production, distribution, marketing, and other conditions. External networks, on the other hand, are relationships between companies within a cluster and parties outside the group, such as LEs, business service providers, input suppliers, and so on (Figure 1). Good internal

cooperation between companies in the cluster and external collaboration with outside parties can produce economies of scale and scope, thereby reducing production costs and strengthening competitiveness.

**Figure 1 Internal networks inside and external networks of a cluster**
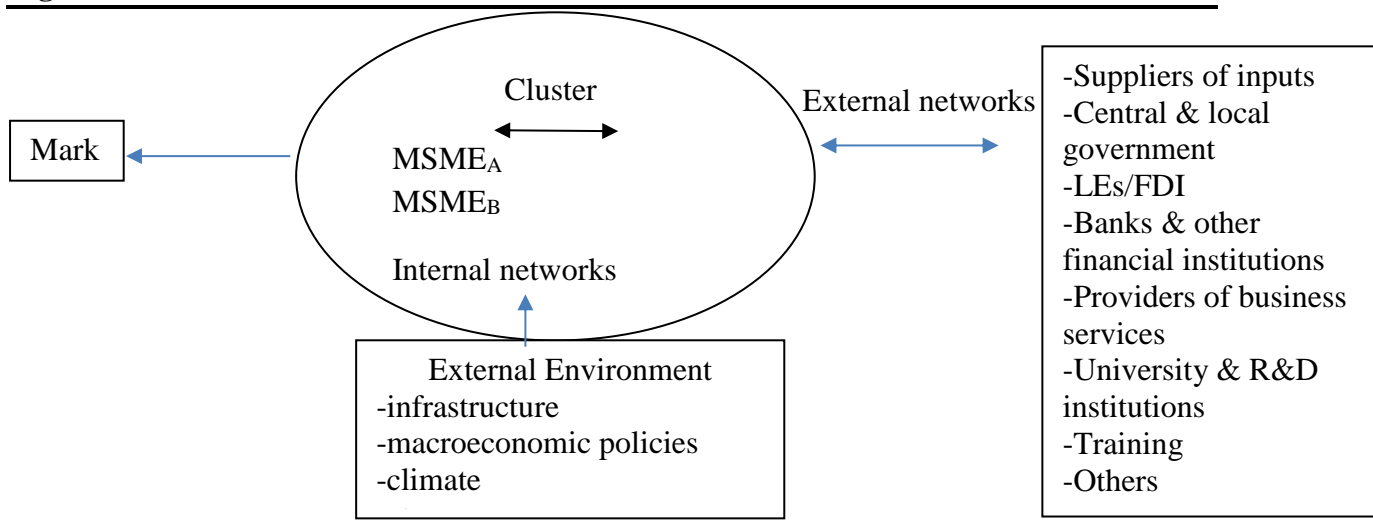


Internal networks or collaboration between MSMEs within a cluster can then be divided into horizontal cooperation between MSMEs occupying the same position in the value chain and vertical cooperation, namely cooperation between MSMEs along the value chain. The advantage of horizontal cooperation is that MSMEs can collectively achieve economies of scale that would be impossible for them to achieve if they worked individually. Through this collaboration, they can also buy large quantities of raw materials and other inputs, making the purchase price per unit much cheaper. Apart from that, the use of machines can also achieve optimal scale. More importantly, by collaborating in production, they can combine their production capacities to fulfill large volume orders compared to producing individually. A collective learning process, where ideas are exchanged and developed, and knowledge is shared between individual MSMEs collectively, can occur through horizontal cooperation that can improve product quality, technology and shift to more profitable market segments, such as the export market.

In vertical collaboration, an MSME can specialize in its core business (for example, making tractor engines) and subcontract other related parts of the work (such as tractor bodies or specific components) to MSMEs within the cluster. However, in many cases, vertical cooperation can also consist of internal and external networks, as it was found that many individual MSMEs entered into vertical collaborations with L.E.s outside the cluster through a subcontracting system.

As the market or economy is determined simultaneously by supply and demand, a cluster's competitiveness level is determined by factor and demand conditions. According to Porter (1990), market demand conditions have three key components: (i) a core of local customers who are not only sophisticated but also demanding; (ii) unusual local demand in specific market segments that can be served both nationally and internationally; and (iii) customer needs that anticipate market needs elsewhere. Meanwhile, Baptista and Swann (1998) distinguished four key factors on the demand side: (i) industrial clusters may emerge or develop rapidly in places where there is intense market demand; (ii) firms in the cluster can increase their market share by approaching their competitors; (iii) as one of the advantages, the existence of industrial clusters reduces consumer search (marketing) costs; and (iv) companies in clusters located near

customers can quickly and cheaply exploit important information flows from their customers, for example by providing additional customer services.

A study from Rockart in 1979, quoted from Grunert and Ellegaard (1992), stated that five factors determined the success of developing an industrial cluster:

1. The industry itself: the characteristics of the market or demand for its products, the type or level of sophistication of technology used in the production process, the characteristics of the products made, etc. According to the study, this first factor can also affect all companies in an industry, but the influence will differ between industry segments according to their respective characteristics and sensitivities.

2. The competitive strategy implemented by companies within an industry and the industry position of the business. The latter, in turn, is determined by the history and competitive position in the industry.

3. Macroeconomic influences affect all companies and factors over which competitors have little or no influence, such as demographics, government economic and legislative policies, etc. Rockart calls this third factor an environmental factor.

4. Temporal factors, i.e., certain areas in a business, make it challenging to implement the strategy chosen by the company's leadership or managers within a limited period. It can happen because, for example, management needs more expertise, or workers need to be more skilled in handling these areas.

5. Managerial positions, i.e., various functional managerial positions in a business, each of which has a series of related determinants of success.

From the findings of their field research, Schmitz and Musyck (1994), cited by Tambunan (2006, 2007), concluded that MSME clusters that are proliferating in many developing countries generally have six general characteristics related to markets (not only local but also regional, national or even global), specific knowledge and skills (according to related business) of employers and workers, an internal organization within the company, the role of self-help organizations and public service facilities especially at the local level, quality of local government support for cluster development, and networks with local institutions providing education/training and technology.

Conclusions from many such as D.T.I. (2004), Menshenina (2008), Meyer-Stamer and Harmes-Liedtke (2009), Porter and Ketels (2009), Magdalena (2011), Koschatzky (2012), Ketels (2011, 2019), and Stichhauerova et al. (2020) is that the key factors determining the successful development of MSME industrial clusters, which include (i) geographical proximity and supported by an adequate physical infrastructure that allows several firms to be located close to each other in the same area that is integrated with the location of their resources; (ii) the willingness of firms in the cluster to cooperate; (iii) access to banks, non-bank financial institutions and other sources of finance. (iv) a strong entrepreneurial culture that makes all firms in the cluster eager to produce the best possible performance in order to maximize their profits; (v) there is a vital innovation and skills base, with supporting R&D activities where appropriate inside the cluster; (vi) interaction occurs between firms in the cluster in terms of, e.g., market segments, the use of technology, and the share of information; (vii) there are "critical number" of firms and the presence of large firms inside the cluster; and (vii) the presence of functioning networks and partnerships.

In its report, A.D.B. (2001) concluded that, to a certain extent, differences in performance between clusters can also be caused by different internal and external conditions. Internal conditions inside the cluster include the Availability of technology, capital, skills of workers and company leaders/managers, and raw materials, while external conditions include market opportunities, economic conditions, and various government policies faced by clusters in various industries and provinces. In many cases, the development of clusters in several industries has stagnated because their output markets have been distorted by monopolistic

practices or other cartels that are generally carried out by L.E.s or government policies that are not business-friendly, such as export taxes or regulations on the import of raw materials that are more profitable for L.E.s, including companies—multinational, rather than MSMEs in clusters.

From a meta-study using a database of clusters in 25 developed countries and 23 developing countries, Linde (2003) found that the size of the industrial cluster in terms of the number of enterprises or workers and the level of cluster competitiveness were positive and statistically significantly related. This study shows that clusters with less than 15,000 workers were slightly less competitive than those with more than 15,000 people. However, she argues that the relationship is more complex than it appears in her analysis that a cluster can quickly become competitive as the number of firms or workers increases. The analysis results show that the least competitive clusters are those with employment between 10,000 and 15,000 workers. In contrast, the clusters that employ less than this number are slightly more competitive. Based on these results, one of the explanations is that clusters require a specific size of raw material producers and suppliers to be fully functional and able to compete in the global market.

In her study, Linde (2003) found that factor conditions are the primary determinant of an industrial cluster's competitiveness level. In Porter's model, what is meant by factor conditions are high-quality and specialized inputs available to the company: human resources, capital resources, and various infrastructures, namely physical, information, science and technology, administration, and natural resources. Baptista and Swann (1998) state three factors of the supply side that are the critical determinants of the performance of a cluster: (i) pooled workers with specialized skills, (ii) knowledge, information, and technological spillovers; and (iii) the Availability of (specialized or non-traded) production factors (besides labor and capital) or a great variety of cheap intermediate inputs. They state that because of congestion and competition effects, the self-reinforcing effect of clusters is limited. According to Hoen (2001), several factors determine the failure or success of cluster development, and the availability of workers with specialized skills is the critical factor. Economies of scale and scope, dissemination of knowledge, and competition from foreign competitors are other essential factors in influencing the existence of an industrial cluster.

Evaluation results from Jaklič et al. (2004) showed several factors for the success of cluster development, namely.

1. Building trust among cluster member companies.
2. The presence of a conceptual leader in the cluster development process (this can be played by the leading firm in the cluster).
3. Support from top management in cluster member companies.
4. Active participation of companies in the cluster.
5. Creation of a joint development strategy and
6. Successful implementation of a joint start-up project.

Jaklič et al. distinguished these six success factors from the most important, namely building trust among cluster members, to the least important, namely the last factor.

Gajšek and Kovač (2016) divided the success factors above using content analysis of internal (which can be influenced by cluster management) and external (where cluster management has no impact) success factors. External success factors are:

1. Institutional incentives such as punishment and reward can provide an effective tool for promoting the development of clusters.
2. The level of infrastructure development, such as roads, telecommunications, electricity, clean water, ports, and others.
3. Availability of skilled workforce.
4. Levels of market development, such as size and number of buyers.
5. Competition with other clusters or with companies outside the cluster and imported goods.

6. The establishment of external relationships between the cluster and, for example, the government, banks, business associations, and others.
7. Institutional support such as grants, start-up funds, policy support, and an entrepreneurial-friendly environment.
8. Market demand and the like.

The internal factors are:
1. The development of a shared vision and strategy by the companies in the cluster.
2. Jointly designing the organization and organizational culture that are aligned with the organizational culture of the companies in the cluster.
3. Jointly define the operating area.
4. Trust between companies and their willingness to cooperate.
5. Successful communication and inter-company partnerships.
6. Creating standard information infrastructure such as uniform software and websites as well as organizational infrastructure such as standard procedures, organizational regulations, and work methodologies.
7. Clear division of roles for each company within the cluster.
8. A large number of human resources with relevant competencies are available.
9. Cluster managers with relevant competencies.

Although firms in industrial clusters have well-developed internal cooperations, which may lead to economies of scale and efficiency, the innovation capabilities of firms inside the clusters are crucial to strengthening the clusters' competitiveness. As explained by Yoo (2003), innovation is a process that is collective and iterative and refers to an environment that encourages people to share and play with each other's ideas and promote the results of innovation in the form of technology, products or production processes. Brouwer (1997) is among several pieces of literature that explain the factors that significantly influence the number of innovations developed in a company. First, company size, growth in market demand, and research and development (R&D) intensity positively affect the possibility of a company carrying out innovation and the number of innovations developed by a company. The facts show that R&D is more intensively carried out in L.E.s and, to some extent, M.S.E.s. In contrast, in M.I.E.s, it is proven that there are no R&D activities at all due to limitations in all supporting resources such as skilled workforce, funds, and advanced technologies. Meanwhile, unstable or sluggish market demand causes companies to postpone or cancel R&D. Second, the level of competition between companies in an industry/sector and the entry of new companies with a smaller scale (e.g., M.S.E.s) into the industry concerned causes diffusion of innovation but does not increase the number of innovations in the industry. Third, collaboration between companies in conducting R&D, technology transfer acquisitions, and innovation centers has a positive but small impact on innovation. However, the first factor positively affects the number of patent applications. Lastly, the location of the company is where innovation is developed. Companies located in central areas of economic and financial activities, such as large cities and their surroundings, have a greater possibility of innovating, and the number of innovations produced is also higher than those located in, for example, rural or isolated areas with poor infrastructure connectivity with surrounding cities.

The Availability of skilled workforce and local universities or R&D institutes and other key stakeholders such as banks or non-bank financial institutions to support financial R&D activities conducted independently by firms inside industrial clusters or in cooperation with local universities/R&D institutes are the most important determinants of innovation capabilities of firms inside clusters.

Another determining factor for success is the existence of effective institutions, especially at the industry level, which facilitate various internal linkages within the cluster and externally with various parties outside the cluster, such as the following:

1. The internal linkages between fellow S.M.E.s in the cluster.
2. The relationship between consumption between MSMEs in the cluster and buyers, especially in the international market.
3. The cluster's linkages with various key government institutions such as the Ministry of Industry, Ministry of Trade, Ministry of S.M.E. (if any), Ministry of Technology, and Ministry of Education, and various other supporting organizations such as the Chamber of Commerce and Industry, sectoral associations, exporter associations, financial institutions, training/educational institutions, and business development service providers.

There are many examples of several private institutions' success in supporting the MSMEs cluster in various Asian developing countries. For instance, in Pakistan, the support of the Pakistan Association of Surgical Instrument Manufacturers in Sialkot and the Sialkot Chamber of Commerce and Industry; in India, the Tirupur Exporters Association, and in Malaysia, the Penang Skills Development Center (see, for example, Abonyi, 2007, 2008; and UNESCAP, 2009).

Finally, Prognesti (2018) found six crucial factors determining cluster life cycle: (i) Innovation (indicator: R&D investment); (ii) entrepreneurship (start-up birth rate); (iii) size (number of firms or number of employees); (iv) spatial significance (specialization); (v) cooperation (intensity of network); and (vi) variety (heterogeneity of knowledge).

## Development of MSMEs Industrial Clusters in Indonesia

Until the 1970s, MSMEs were geographically grouped and termed by the Ministry of Industry of the Republic of Indonesia "industry centers." Only recently has the term cluster emerged, even though centers and clusters are different: MSME centers are usually the location of several MSMEs that make the same goods, while MSME clusters, as can be seen in Europe, for example, are the location of not only of MSMEs that make the same goods, but also suppliers of raw materials and other inputs, repair shops for machines or production equipment, and there are even L.E.s who establish subcontracting with MSMEs. MSME centers or clusters in Indonesia are well documented because they are a particular target group for industrial MSME development policies.

In Indonesia, MSME clusters have existed for a long time, even long before independence in 1945. There is a difference between micro and small enterprises (M.S.E.s) and medium enterprises (M.E.s). The first group of enterprises tends to be more clustered geographically and by industry group than M.E.s. Official data from the Ministry of Cooperatives and S.M.E.s shows that at the end of the 1990s, there were around 9,800 MSME clusters in the manufacturing industry, and in 2003 there were more than 10,000. MSME clusters are spread across all provinces in the country. However, the majority are in Java Island, which in the early 2000s was recorded at approximately 69% compared to Sumatra Island, which accounted for less than 12%. Java Island is the majority of Indonesia's population, and the center of manufacturing and industrial activity in the country is on the island of Java.

Furthermore, on the islands of Maluku and Papua, it is less than 1%, and on the island of Kalimantan, it is less than 5%. Many MSME clusters are mainly in food processing (non-furniture), wood, rattan, and bamboo furniture, fire bricks, apparel, roof tiles for primary iron and steel products, and various craft products. A study by Loebis and Schmitz (2005) shows that many clusters are also export-oriented. However, most are indirectly through production linkages with L.E.s in the form of subcontracting and commercial arrangements.

Judging from their origins and age, most MSME clusters were formed naturally as traditional activities of local communities who have special skills in making certain items such as chairs

and cupboards, batik, various kinds of children's toys from wood and plastic, shoes and sandals, various kinds of women's bags, simple kitchen utensils such as pans and plates, and this process has been going on for a long time. According to Tambunan (2005), based on the comparative advantage of the goods they produce, at least in terms of the abundance of local raw materials and the specialization of labor in manufacturing these products, many of these clusters have great potential for development. For example, clusters of batik producers, a traditional Indonesian textile, have long existed in various regencies on the island of Java, such as Yogyakarta, Pekalongan, Cirebon, Surakarta, and Tasikmalaya.

Most recent data from 2020 show that the number of MSME industrial centers is 13,762, with more than 75% dominated by micro-scale processing industries. According to the industry group, the motor vehicle, trailer, and semi-trailer industries have the same percentage of micro, small, medium, and mixed-scale industrial centers, namely 25% each. The industrial groups with the most significant industrial centers on micro, small, and medium scales are woven products made of bamboo, rattan, and the like, the food processing industry, the non-metal mining industry, the wood industry, and industries producing a variety of goods from wood, and cork products (excluding furniture). The industrial groups with only micro-scale industrial centers are the computer, electronic, and optical goods industries. Meanwhile, industrial groups with industrial centers only on micro and minor scales are found in the paper and paper goods industry. Several industrial centers that have been established since the early 1900s include brick and pottery industry centers in North Sumatra Province, roof matting industry centers in Riau Province, bamboo woven industrial centers in Central Java Province, and silver industry centers in the Special Region of Yogyakarta Province (D.I.Y.), the center of the pottery and blacksmith industry in East Java Province, the brown sugar industry center in North Sulawesi Province, and the center of the wine industry in East Nusa Tenggara Province.

As shown in Figure 2, based on regional distribution, the three regions with the highest number of industrial centers are the province of Central Java, with 3,460 centers; the province of East Java, with 2,119 centers; and the province of West Java, as a location for 1,538 centers. Meanwhile, the three provinces with the number of centers with the fewest industries are North Maluku Province, Papua Province, and North Kalimantan Province, with four centers, five centers, and 12 centers respectively.

**Figure 2 Number of MSME Industrial Centers/Clusters by Province, 2020**
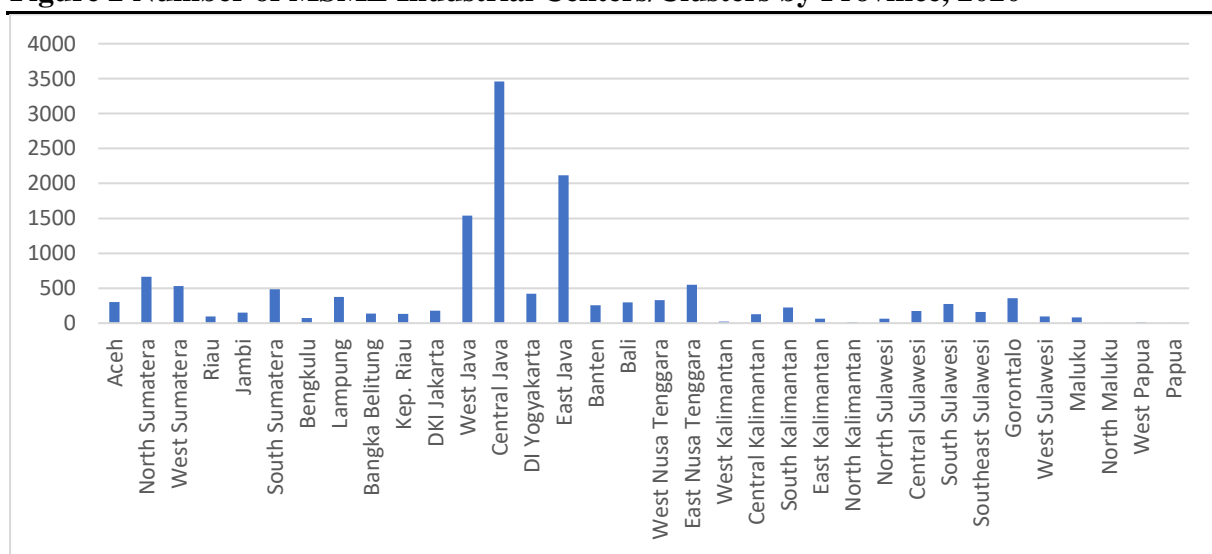


Source: BPS (2021).

Compared Figure 2 with Figure 3 which shows the number of MSEs per province, it may suggest that there is a tendency for provinces with a large number of MSMEs to also have a large number of clusters. However, it can be seen that there are some provinces where their number of MSEs is larger than in some other provinces but their number of clusters is much smaller. For instance, West Kalimantan has 39149 MSEs in the manufacturing industry but only 23 clusters, while Central Kalimantan has 23273 manufacturing MSEs dan 127 clusters. This means that many MSEs are located far from each other in many areas. In Indonesia, there are many small villages that have only very few MSEs and do not partner with other parties. They serve only local markets in their surrounding villages.

**Figure 3 Number of MSEs by Province, 2020**
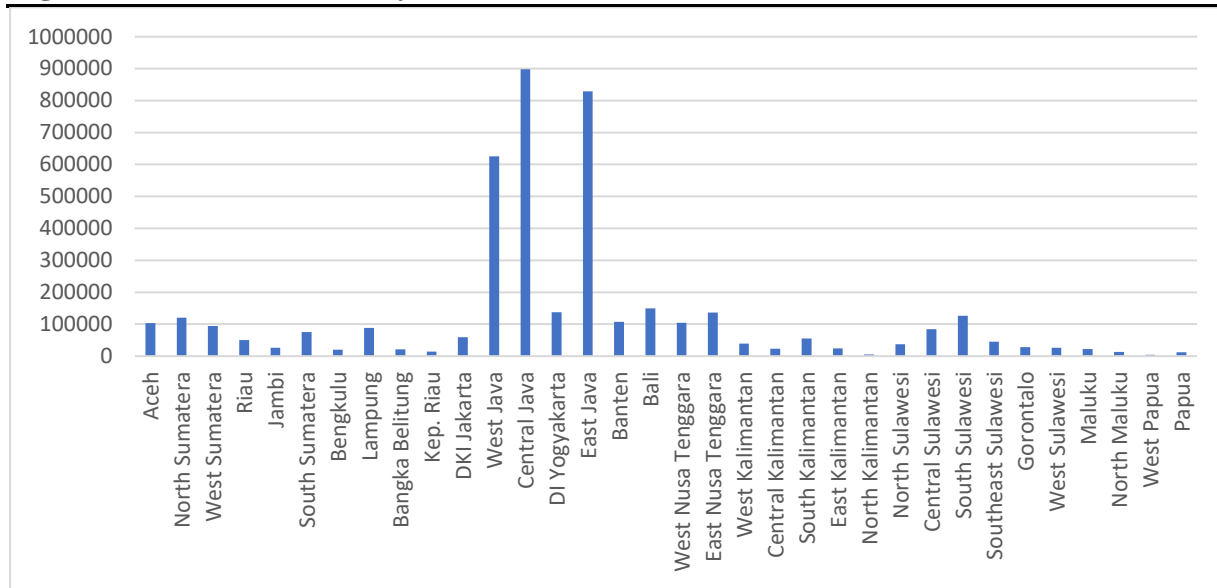


Source: BPS (2021).

The most types of industrial centers were food industry centers (ISIC code 10), such as *tempe*/tofu industrial centers, chips industrial centers, and cake industrial centers, namely 41.29% or as many as 5,683 centers. The second largest number of centers were industrial centers for wood, wood, and cork products (not including furniture) and industries making woven products from rattan, bamboo, the like (ISIC code 16) with 14.29% or 1,967 centers. The dominance of the two types of industry is in line with the 2020 Manufacturing MSEs Data Profile from BPS, where the food industry and the wood, wood and cork products and woven products from bamboo, rattan, and the like are the two most common types of industry, respectively, reaching 36.23% and 15.03% of the manufacturing MSME population. Meanwhile, the third largest was the center of the industry producing a variety of non-metal mineral goods ( ISIC code 23), namely 11.05% or 1,521 centers. Unlike the two types of centers with the most numbers, the non-metal mineral goods industry (ISIC code 23) ranks fifth in the 2020 Profile data. The food industry centers (ISIC code 10) with the largest number of industrial centers in Indonesia are spread across all provinces. The largest number of food industry centers is in Central Java Province, which is 27.36% or 1,555 centers. Next is East Java Province with almost 13.8% or 783 food centers, followed by West Java Province which accounted for approximately 12.95% or 736 food centers.

**Figure 4 Number of MSME Industrial Centers/Clusters by Industry Group (KBLI), 2020.**
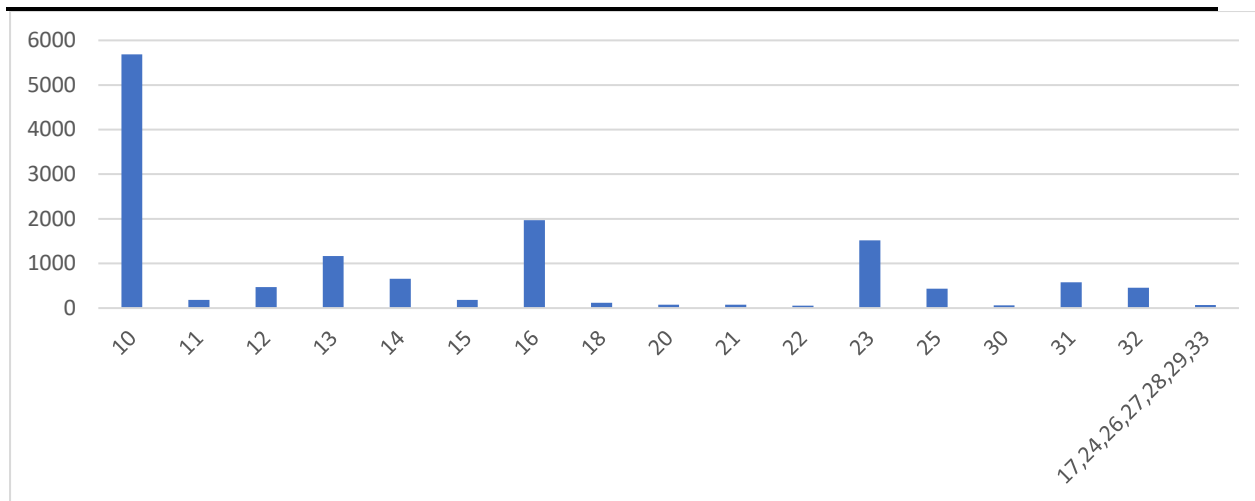


Note: ISIC Code: 10: food, 11: beverages, 12: tobacco processing, 13: textiles, 14: apparel, 15: leather, leather goods, and footwear, 16: wood, wood products and cork (excluding furniture), woven articles from rattan, bamboo, and the like; 17: paper and paper articles; 18: printing and reproduction of recorded media; 20: chemicals and articles of chemical substances; 21: pharmaceuticals, chemical medicinal products, and traditional medicine; 22: rubber, articles of rubber and plastics, 23: non-metal minerals, 24: base metals, 25: non-machined metal goods and their equipment, 26: computers, electronic and optical goods, 27: electrical equipment, 28: YTDL machinery and equipment (excluding others), 29: motor vehicles, trailers, and semi-trailers, 30: other means of transportation, 31: furniture; 32: other processing; 33: repair and installation of machinery and equipment
Source: BPS (2021).

**Types of Industrial Clusters**
According to Sandee and ter Wingel (2002), who did a study on rural industries in Central Java in Indonesia, there are four types of MSME clusters with different levels of development and have their characteristics, namely the following:

**Artistic**
This category (i.e., early development stage) dominates the country's MSME cluster (roughly more than 90%). It shows that the process of developing MSME clusters in the industrial sector in Indonesia is still in its early stages. Previously, Altenburg and Mayer-Stamer (1999) had also researched the same thing. This cluster category was called the "surviving" MIE cluster because this type of cluster displayed many characteristics of MIEs, such as low levels of labor productivity and wages, using primitive or obsolete tools and equipment, many producers are illiterate and passive in marketing (they do not know where their market is; they rely heavily on intermediaries or traders for marketing). In clusters like this, there is no level of cooperation among producers and no vertical collaboration with companies outside the cluster. Inter-company specialization is also very low; all producers in the cluster make the same goods, such as components, spare parts, food products, children's toys, bamboo chairs and tables, and simple kitchen utensils. There is no external network with supporting organizations, including the government. There is no market expansion, and most clusters of this type are oriented to the local market (low-income consumers). Also, no accumulated investment, increased production volume, and no efforts were made by MIE owners to improve their production

methods, management, and organization to increase productivity and product quality. All these traits make many clusters of this type stagnate.

**Active**
Very different from the first cluster category, clusters from this second category (i.e., the second level of development) are developing rapidly in many ways, namely production, skills, technology, and marketing, not only successfully penetrating the domestic market but also the export market through intermediaries or traders or trading houses from outside these clusters (although not all clusters from this category focus on foreign markets). However, many clusters are active but still artisanal, which still need to be solved, especially those related to the quality of the products produced, and the market is primarily local or domestic. In Indonesia, typical examples of this type of cluster are the brass crafts cluster, footwear cluster, roof tile cluster, shuttlecock cluster, and metal casting cluster. In these clusters, companies, which are generally from the SE or ME category, are proliferating and have external solid networks with many parties outside the cluster, including LEs, influencing the direction of development of these clusters. They are usually called the leading company and are very active in marketing.

**Dynamic**
This third category (i.e., the third level of development) is characterized, among other things, by expanding exports. Compared with active clusters, there are more export-oriented companies in dynamic clusters, although it is often found that not all of their products are marketed abroad. Production specialization between companies and cooperation within the cluster is well developed. Another characteristic is that internal heterogeneity in business size or scale, technology used, and markets served is very clearly visible in clusters of this category. One of the most striking characteristics of this type of cluster is the decisive role of the leading firm, which leads/pioneers the direction of the cluster's development. Usually, the leading firm is more prominent in scale and grows faster. The firm manages a large and diverse set of relationships with companies and institutions inside and outside the cluster. Supratikno (2002a,b) found that several leading companies in this type of cluster had utilized the latest technology in production.

**Advanced**
This fourth type is the later stage of development of MSME clusters. However, in Indonesia, only a few clusters of this type have developed more rapidly and have a more complex structure than the third type of cluster. Also, in this fourth type, the level of specialization and cooperation between companies is higher. In general, the companies in the cluster have developed strong business networks with various parties, including suppliers of raw materials, components, equipment, and other inputs, business service providers, traders, distributors, banks, and other supporting institutions. Another characteristic that distinguishes this fourth category from active clusters is the existence of good cooperation between companies in the cluster and local, regional, or even central (national) governments, as well as with various institutions such as training institutions to improve the skills of business owners and workers and universities to carry out unique research and development. A report from ADB (2001) shows that there are quite a lot of companies in this type of cluster that are export-oriented. But most of them export indirectly through trading houses or export companies. Many clusters of the fourth type also develop geographically, for example, by routinely utilizing raw materials or other inputs from nearby areas or developing regular collaborations with universities or research institutions in other cities.

**Some "Advanced" Clusters**
**Roof Tile-Making Industry**

Rural Central Java's roof tile manufacturing industry is typical of grouped traditional industrial activities, which existed long before Indonesia became independent. The clusters generally dominated by MSEs can easily be found in all corners of Java Island, mainly in rural areas. They are located near rivers or irrigated rice fields, which supply clay as the primary raw material. Since the mid-1980s, as average per capita income has increased and economic development is accelerating, demand in both urban and rural areas has shifted from the much cheaper traditional roof tiles to pressed tiles made with presses and mixers. Presses are hand or power-operated, and mixers are power-driven to prepare the clay. The increasing demand for pressed tile has driven the application of pressing technology in more and more traditional tile clusters throughout the villages on the island of Java. There are many pressed tile MSME clusters in rural Central Java that have developed well due to, among other things, the active support of the local government. Local governments often give The form of support by organizing study tours for selected pressed tile producers to other locations, usually in the same district or province, where press technology is widely used. The tour includes visits to equipment suppliers, and on the occasion of a visit like this, the supplier uses this opportunity to promote their products and open up new markets.

One of the distinguishing features of pressing technology is that the successful adoption of the innovation required the introduction of the power-driven clay mixer. The leading manufacturers in the tile press cluster purchased expensive mixers only with the guarantee that other manufacturers in the cluster would pay for the service. In this network, the smaller companies in the cluster that usually need more skilled workers and managers with extensive knowledge, capital, and technology receive business development services from their more significant partners. Major companies and mixer owners, in turn, provide advice on tile molding and firing. In addition, they also encouraged small producers in the cluster to adopt press technology, which led to increased demand for their mixer services.

**Jepara Furniture Making Industry**

The largest furniture cluster in Indonesia is the Jepara Furniture Industry, located in the city of Jepara in the province of Central Java. This cluster, known for its fast and successful product line imitation in the West, makes a wide range of chairs, cabinets, beds, sculptures, and other wood-based products. It sells them in domestic and foreign markets, especially in Europe. Initially, this cluster was not well known, but after several exhibitions at home and abroad, Jepara furniture became well-known and in demand. Furniture marketing for the domestic market is usually based on contacts between a network of producers within the cluster and specific traders linked to furniture shops in various other cities. In contrast, for export purposes, marketing is carried out jointly between producers to facilitate mass export by containers to international markets.

Unlike most other MSMEs clusters, in this cluster, there are specialization practices and division of labor between MSMEs in the cluster and LEs and traders outside the cluster. MSMEs are mostly subcontractors involved in a production network managed by several LEs and traders. Only a few independent producers usually make furniture based on orders from individual consumers. Under the subcontracting system, MSMEs hand over semi-finished products to LEs for final finishing before entering the market. Usually, MSMEs, as subcontractors, get advances to finance production. With this system, not only can LEs carry out quality control, but it is also possible for LEs to concentrate on specific stages of production while contracting out other stages to MSMEs. The advantage for MSMEs of this subcontracting system is that in addition to a guaranteed market, they, as producers, can concentrate on production and leave the management and risk of the market, with changing tastes and fashions,

to LE as the leading company and trader. This subcontracting system also creates collective efficiency and reduces costs.

According to the research results of Sandee et al. (2000, 2002), in contrast to the 80s, by the early 2000s, subcontracting relationships were multi-layered in this cluster. Many skilled itinerant furniture artisans offered services to the highest bidder, and most were employed by joint ventures or foreign companies, which offered the highest wages.

Based on data from the local government of Jepara, in the mid-1990s, this cluster employed more than 40,000 permanent workers in more than 2,000 MSEs and 100 MEs and LEs spread across 80 villages. In their research, Sandee et al. (2000, 2002) found that around 30% of the added value generated by this cluster came from sales to the domestic market, mainly supplied by MSEs where, at that time, the technology was still relatively simple.

Sandee et al. (2000, 2002) and Berry et al. (2002) have examined the development of this particular cluster for some years, and they have identified several important factors that determine the success of the development of furniture clusters in Jepara. First, the vital role of the local sector association is to provide various kinds of support to furniture producers in Jepara, including training and market information, and also act as a liaison with the local and central government. Second, prolonged exposure to foreign tastes brought by international tourism has made furniture from Jepara sell well abroad. Third, the amount of investment made by foreign immigrants who visited Jepara for the first time as tourists and, after several visits, finally settled in Jepara, married Jepara women and opened furniture businesses. Fourth, the vital role of trade institutions in intermediary and export organization. In particular, Jepara's furniture exports have significantly benefited from the traditional ties of several trading houses in Jepara and other locations in Central Java Province with China, one of the world's largest furniture markets.

**Tegal Metalworking Industry**

The Tegal metalworking industry in Central Java province, located on the north coast near the border of West Java province, has a long history of metalworking industry. Tegal has been a metalworking center since the 19th century when it was the location of several sugar processing factories and related companies, including a Dutch locomotive workshop and a metal processing factory. In general, the technical ability of the Tegal people to produce items from metal comes from a long history of family experience in metalworking or similar industries. During the New Order era (1969-1998), especially in the 70s and 80s, economic development took place rapidly, including massive infrastructure development, which encouraged the Tegal metal industry to proliferate. In the early 1980s, subcontracting activities between the Tegal metal industry cluster and several car and engine companies in Indonesia began for the first time in the district, which prompted the central government to develop the cluster further.

Initially, the Tegal metal industry cluster was dominated by the plate forming business, and its comparative advantage was in fulfilling small orders for simple metal products or components, primarily for household appliances, especially kitchenware, various kinds of handicrafts, but also for chairs and tables in various fashions. With the accumulation of technical knowledge over more than 50 years since the first subcontracting activities began, many metal artisans in the cluster can now produce various types of agricultural and industrial machinery and automotive and ship components. However, the quality of most of its products still needs to improve.

If measured by production volume and level of production sophistication, there are two types of workshops in the Tegal cluster: MEs, called core, and MSEs, which act as plasma. The core workshop accepts orders for metal components from companies outside the cluster. In particular, large-scale core workshops with up to 100 employees derive most of their income from subcontracting work.

The most crucial difference between core and plasma workshops is that core workshops have direct subcontracting relationships with LEs from outside the cluster, including foreign-affiliated companies (FDI). In contrast, plasma workshops have subcontracting agreements with core workshops (or workshops with indirect production links with LEs). Plasma workshops usually use low-paid, unskilled labor and often use family members (especially men) as unpaid workers. The plasma owner passes on basic metalworking skills to his workers, which makes the workshop's technical capacity highly dependent on the technical capacity of the owner. Core workshops often subcontract part of their production, usually certain parts that are relatively easy to work on, to plasma workshops.

The existence of business linkages in the form of subcontracting with LE, especially FDI, is very important for the sustainable development of the Tegal metalworking industry because the primary source of advanced technologies in metalworking comes from those transferred through subcontracting production relationships. However, it is not easy to access such technologies from FDI. Companies in the cluster must first become subcontractors. The companies must prove they have a specific technical and managerial capacity as highly competitive and efficient subcontractors. The companies must convince FDI that they can produce high-quality components or subcomponents and meet tight delivery times. In addition, audits are carried out to determine whether these companies that apply as subcontractors have the necessary machines, workforce, facilities, legal standing, and use of ISO standards. After that, in the final stage, these companies were asked to make component samples from the technical drawings provided to them.

**Problems Faced by MSMEs Industrial Clusters**

Many MSME clusters on the island of Java, which used to proliferate in the 1970s and 1980s and have received various facilities sponsored by the local and central government, are now experiencing difficulties due to various factors: the minimum wage rate determined by the local government continues to increase every year, the price of raw materials and fuel are skyrocketing, the tax burden is getting heavier, the high cost of importing essential ingredients in products denominated in Rupiah due to the weakening of the currency against the USD, and heavy bureaucratic burdens. Supratikno (2002b) concludes that the result of inappropriate macroeconomic policies that have created an "unfriendly" business environment is also the cause of many clusters that are getting worse despite direct support from the government for these clusters.

Based on the literature review on critical success factors, it can be emphasized that most of the failures of government policies to support cluster development in Indonesia are caused by the absence of one or more critical success factors for cluster development or are not appropriately handled. Ignoring existing market opportunities and the potential for clusters to access emerging markets are two reasons for this failure. One of the prerequisites for successful cluster development is the potential of clusters to penetrate the market. In Indonesia, although today's policy-making and decision-making processes are less centralized than before the implementation of regional autonomy after the 1997/98 Asian financial crisis) Moreover, they are no longer oriented toward standardized instruments; the diagnosis of specific potentials and constraints experienced by individual clusters and market relations still need to be noticed in project design.

Limited support from the local governments is another reason for the failure. Based on data from 2020, of all MSME industrial centers in Indonesia, only 2,600, or around 18.89 percent, are under the guidance of government/private institutions, while the rest, namely 81.11 percent of industrial centers, still need to receive guidance. The provinces with the highest percentage of industrial centers receiving guidance are East Kalimantan at 72.58 percent, North Kalimantan, and North Maluku at 50.00 percent each. The provinces with the lowest

percentage of industrial centers receiving guidance were West Sulawesi Province at 1.06 and Aceh at 7.64 percent. Papua Province is the only province where none of its industrial MSME centers are fostered by government or private institutions.

The fact shows that in many regions, the government seems to be aware of the specific problems being faced by MSME clusters in their areas, which are generally related to the lack or low quality of infrastructure, means of transportation, telecommunications or electricity, limited access to banks and other financial institutions for capital and access to markets. Many local government officials are prepared to provide support flexibly where possible, for example, by assisting the producers in the cluster with appropriate marketing or sales locations on interregional roads or by providing mobile phones to business owners in clusters who do not have terrestrial telephone connections on credit. Personal. However, the lack of budgetary autonomy severely limits the ability of local governments to be more flexible in providing appropriate and direct assistance, for example, in repairing damage to the main highway connecting the cluster to the main road.

Regional autonomy in Indonesia may provide challenges and complete freedom for local governments to initiate, formulate, and implement development policies or programs on MSMEs in their own territory. Unfortunately, most local governments at the district (*kecamatan*) level are not yet ready to do such tasks independently. They had lived too long under the 'top-down' system during the Soeharto regime; they needed to figure out what to do, especially in formulating a good policy or program, and experience implementing it without the central government's guidance. Besides that, from his study of clusters in Sumatera, Tambunan (2005) finds that the lack of coordination between the central government and regional governments and regional government institutions is the primary failure of cluster development policies in Indonesia. It is often found that different government institutions, for example, the Ministry of Industry, the Ministry of Cooperatives and SMEs, or the Ministry of Trade, provide similar schemes/programs for cluster development,

Lack of support from private organizations such as banks and other financial institutions, chambers of commerce and industry, sectoral associations, entrepreneurs' associations, universities, R&D institutions, vocational training institutions, and others is also an essential reason for the failure of cluster development. Not all private organizations, especially banks, are thoroughly interested in building business networks with existing clusters in their region, especially those that only produce for the local market or supply a stagnant market (as is usually done by producers in this type of cluster). "artisanal"). Often the location of clusters which are located in remote rural/underdeveloped areas and far from the center of economic activity in urban areas is another reason for private institutions that have the potential to support clusters such as banks, training institutions or universities not fully implementing them.

The stagnation in the supply of raw materials is also one of the reasons for the stagnation of many clusters. For example, the nucleus estate program has successfully developed small-scale agricultural producers around large-scale external processing units in many rural areas outside Java Island. However, when the concept was implemented on the island of Java, it failed due to a lack of raw material supply. Many export-oriented medium-scale processing units, such as the canning of baby corn in Sukabumi district in West Java province or pineapple juice concentrate in Subang sub-district, Subang regency, also in West Java province, which was built with substantial government subsidies, were forced to close after a few moments, after starting operations due to lack of raw materials (i.e., corn and pineapples) or insufficient volume to produce efficiently. The reason for this undersupply is that existing local primary producers only supply mills that have successfully connected with the growing and desirable fresh produce markets in urban centers on the island of Java and provide better prices. In other words, the owners of corn and pineapple plantations benefit more from doing business with these mills than the export-oriented canners of easy corn and pineapple juice concentrate.

Ignoring or eliminating the potential for self-help clusters is also one of the reasons for the failure of MSME cluster development. In fact, for developing new markets and supply channels, strong and active self-help organizations of cluster members are needed to facilitate collective learning and strategic orientation processes. Such organizations urgently needed to implement advanced cluster development strategies consisting of collective branding, standardization and distribution, representation of collective interests against monopsonistic client structures, or enforcement of quality standards at input suppliers. Moreover, with government and private sector (e.g., chambers of commerce and industry, sectoral associations, employers' associations, and others) assistance is often limited, sustainable development of MSME clusters, in the long run, is highly dependent on cluster members and their self-help organizations.

Another promising study to be mentioned here is that from JICA (2004). In order to prove the importance of internal and external networks for competitive clusters according to the theory of cluster, JICA conducted research on the performance of many clusters in Indonesia, especially on the island of Java. The most important conclusion of its report is the weak or nonexistent production specialization between companies within the cluster; all make the same product, even selling to the same market. There is no strong business network between clusters and outside stakeholders such as local universities, research and development institutions, banks or other formal non-bank financial institutions, local governments, and LEs concluded in this report also as the reason for the failure of the development of many clusters in Indonesia.

## Conclusion

By analyzing secondary data from official sources and reviewing the results of several previous studies regarding MSME industrial clusters, this descriptive study found that the number of MSME industrial clusters is centralized on the island of Java, where more than half of Indonesia's population lives. The level of development is relatively more advanced than other regions in Indonesia, particularly industrial groups such as the food and wood industries.

Another important finding is that even though the development of MSME industrial clusters has been the focus of MSME development policies in Indonesia, many clusters have not received guidance from the government. It could be due to limited government funds and the need for more proactivity of local governments. In the era of regional autonomy, the proactiveness of the local government, especially at the district level, will significantly determine the success of regional economic development, including its industry.

Even though it has been successful in many cases nationally, the policy of developing MSMEs through a clustering approach has yet to be entirely successful. In general, MSME clusters in Indonesia are still more like centers that are only inhabited by companies that make the same goods. There are no related or supporting companies such as producers of components and processed raw materials, as is usually the case with clusters found in Europe and the US. Most failures can be caused by the fact that one or more critical factors for the successful development of an MSME industrial cluster are missing or not handled properly.

One thing for sure is that only MSME industrial clusters with those critical success factors, as discussed previously, have more chances to survive or even sustain their growth during trade liberalization. Unfortunately, at least based on official data and existing case studies of the existing MSME industrial clusters in Indonesia, the majority are from the "artisanal," characterized by low competitiveness and stagnation.

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