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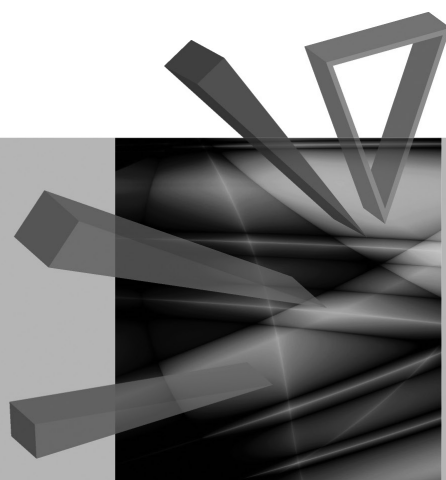
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Innovation Sources of Economies in Eastern Asia



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CHINESE INDUSTRIAL CLUSTERS

Summary: Clusters are an increasingly common form of business cooperation, which gives affiliated entities tremendous growth opportunities and shared experience. The countries of the Asia-Pacific region are becoming an increasingly popular place to locate clusters, which stems from various factors. The Asian region is an attractive region for foreign direct investment – so many new businesses are created there. Also there exists a strong tradition of industry, so clusters are formed naturally as a consequence of the concentration of specialised industries in the area. The clusters located in China are an example of a stronger industry concentration than average industrial clusters. Many regions in China are concerned only with specific products (e.g., textiles), which are sold on national and international markets. They are extremely well-organised clusters-cities, where a large number of small and medium enterprises operate, which by acting together are more likely to achieve a high level of competitiveness.

Keywords: Chinese clusters, industrial clusters, development.

The countries of the Asia-Pacific region are becoming an increasingly popular place to locate clusters. On the one hand, there are clusters which are created by a bottom-up initiative, which is derived from enterprises themselves; on the other hand, some clusters are made due to strong support of public institutions. The growing phenomenon of clustering results from various factors. First, the Asian region is an attractive region for foreign direct investment, so there are many new businesses. Often, foreign companies transfer experience when creating clusters for the benefit of local entrepreneurs. Second, in Asian countries there is a strong industrial tradition; therefore, clusters are formed naturally as a consequence of the concentration of specialised industries in the area. Third, there are many small- and medium-sized Asian companies that are involved in international trade and only through the creation of a cluster have a greater impact on the market, such as garment manufacturing in the world. Fourth, the local authority provides an effective policy cluster, which supports cluster initiatives and entrepreneurs' awareness of potential benefits of this form of cooperation.

Asian clusters differ significantly from each other and there is no single Asian model of clusters. In Asia, clusters are formed bringing together a large number of small and medium enterprises, which by cooperation join forces, but also one can

provide many examples of clusters created by large transnational corporations that are surrounded by their suppliers and make up whole industrial cities. Asian clusters are diverse, as are various Asian economies. On the one hand, one can observe clusters, dealing with the simplest production, formed in the Asian developing countries; on the other hand, there are clusters of modern technology, supra-regional units that make up the international market, from the Asian developed countries. The goal of this article is to present Chinese clusters, the nature of their operation and the models of creation which are typical for Chinese industry.

Chinese clusters are typical industrial clusters, which is identical with the nature of Chinese manufacturing firms. Identifying China as a country that is “factory of the world” translates into models of clusters occurring in this country. Individual regions and industrial cities have been highly specialised in the production of certain goods and have become a world centre for this kind of production, for example, Socks City, Sweater City, Kid’s Clothing City, Footwear Capital, and so on. Chinese clusters are derived somehow from “specialty cities” of a particular kind. They associate thousands of specialised small and medium enterprises but also larger players, who cooperate with each other in the same area, which naturally favours formation of clusters in China. The cluster-based rural industrialisation not only plays a significant role in China’s industrial growth, but was also important in the early stages of industrialisation in other East Asian countries.¹ Most of the industrial clusters in China have emerged spontaneously, as in many other countries, but the government (especially local governments) has given all kinds of support to their development process. Chinese clusters operate mainly in the labour-intensive manufacturing sectors, that is, at the lower end of the global value chain.²

Actually in China a lot of clusters exist and this number is still increasing in connection with enlarging industrialised regions. Some cities have become famous for their particular industrial cluster, just a few examples of which are electronic products in Dongguan (Guangdong), bras and ladies’ underwear in Shantou (Guangdong), transport equipment in Shandong and lighters in Wenzhou (Zhejiang). Clusters are predominantly still located in the eastern part of the country (see Figure 1).

One of the examples of Chinese clusters which can be considered as a “specialty city” is Zhili Cluster. Zhili is a town named after textile industry located in the east of the Huzhou city in Zhejiang province. It is a complete production chain of children wear composed of 10.4 thousand enterprises, which represent particular links in the production chain, such as design, printing, embroidery, buttons and garment manufacturing factories. Most of the output of the companies from the cluster is directed to the international market, only 21% remains on the domestic

¹B. Fleisher, D. Hu, W. McGuire, X. Zhang, *The Evolution of an Industrial Cluster in China*, Development Strategy and Government Division, IFPRI Discussion Paper No. 00896, September 2009, p. 1.

²D.Z. Zeng, *How Do Special Economic Zones and Industrial Clusters Drive China’s Rapid Development?*, Policy Research Working Paper 5583, The World Bank, 2011, p. 25.

market. The cluster and related industries are responsible for 40% of the GDP of the whole region and 250 thousand of 300 thousand people in the town are migrant workers and entrepreneurs involved in cluster's activities.³

What is extremely interesting is the geographical distribution of industrial clusters in China. There are several regions concentrating most dominant clusters, while the others lack these forms of cooperation or they do not have a strong influence. Definitely the largest number of clusters is located in the east as shown in Figure 1. By contrast, most clusters are clusters from several dominant industries as shown in Table 1.

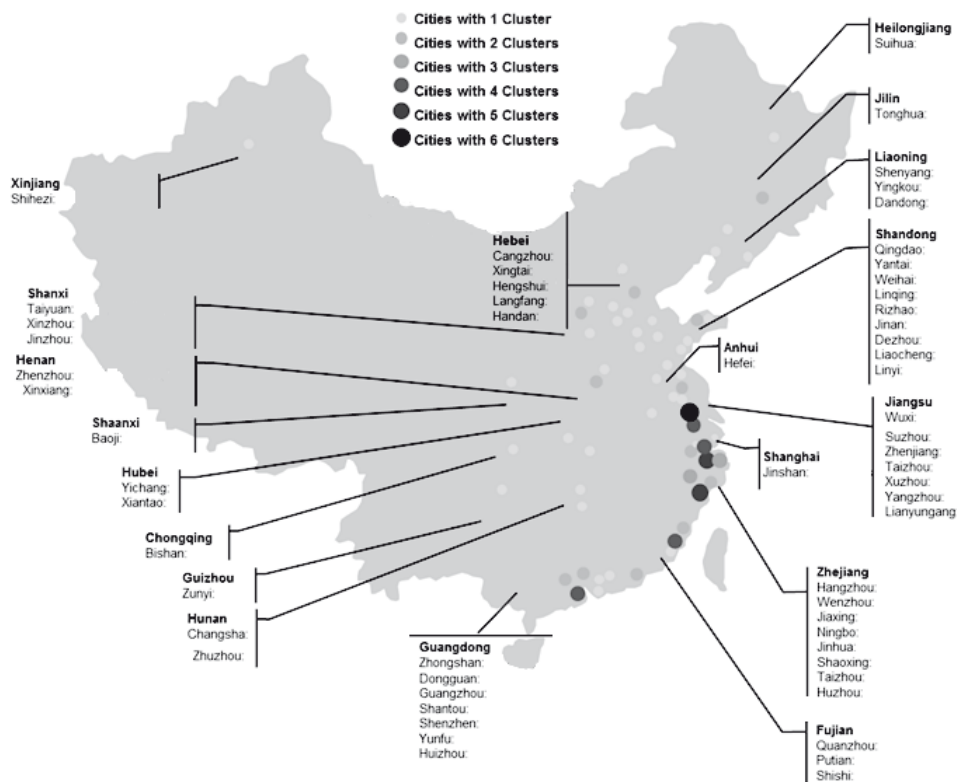


Figure 1. Industrial clusters in China

Source: Li&Fung Research Centre, The Beijing Axis, www.thebeijingaxis.com.

³ H. Zuhui, Y. Jifei, S. Yu, *Stay Factors in the Industrial Transfer of Cluster: A Case Study of Children Wear Cluster of Zhili, Zhejiang, China*, Systems of Innovation for Inclusive Development, International Development Research Council, Canada, pp. 3–4.

Table 1. Top 100 industrial clusters in China

Provinces/municipalities/ regions (number of clusters)	City/county	Industrial clusters
1	2	3
Zhejiang province (25)	Xiaoshan, Hangzhou	Steel structures industrial cluster
	Fuyang, Hangzhou	Boxboard industrial cluster
	Lucheng, Wenzhou	Lighter industrial cluster
	Ouhai, Wenzhou	Locks industrial cluster
	Leqing, Wenzhou	Medium and low voltage electrical appliances industrial cluster
	Longwan, Wenzhou	Valves industrial cluster
	Pingyang, Wenzhou	Plastic woven packaging industrial cluster
	Chongfu, Tongxiang, Jiaxing	Fur industrial cluster
	Haining, Jiaxing	Leather industrial cluster
		Warp knitting industrial cluster
	Pinghu, Jiaxing	Opto-mechatronics industrial cluster
	Yuyao, Ningbo	Mold industrial cluster
	Cixi, Ningbo	Household electronic appliances industrial cluster
	Ninghai, Ningbo	Stationery industrial cluster
	Yiwu, Jinhua	Small commodities industrial cluster
	Yongkang, Jinhua	Hardware industrial cluster
		Electric tools industrial cluster
	Shaoxing	Textile industrial cluster
		Dyeing industrial cluster
	Zhuji, Shaoxing	Socks industrial cluster
		Pearls industrial cluster
	Shengzhou, Shaoxing	Ties industrial cluster
	Wenling, Taizhou	Plastic shoes industrial cluster
	Luqiao, Taizhou	Solid waste recycling industrial cluster
	Anji, Huzhou	Bamboo products industrial cluster
Jiangsu province (16)	Yixing, Wuxi	Electric wires and cables industrial cluster
		Environmental protection equipment industrial cluster
		Purple clay tea ware industrial cluster
	Xishan, Wuxi	Electric car industrial cluster
	New district of Wuxi	Electronics industrial cluster
		Photovoltaic industrial cluster
	Kunshan, Suzhou	IT industrial cluster
		Circuit board industrial cluster
	Changshu, Suzhou	Apparel industrial cluster
	Shengze, Wujiang, Suzhou	Silk textile industrial cluster
	Danyang, Zhenjiang	Eyewear industrial cluster
	Jingjiang, Taizhou	Ship building industrial cluster
	Jiangyan, Taizhou	Energy equipment industrial cluster
	Pizhou, Xuzhou	Wood processing industrial cluster
	Jiangdu, Yangzhou	Leather shoes industrial cluster
Donghai, Lianyungang	Silicone products industrial cluster	
Guangdong province (13)	Zhongshan	Machinery and electronics industrial cluster
		Packaging industrial cluster
	Guzhen, Zhongshan	Lighting industrial cluster
	Shaxi, Zhongshan	Casual wear industrial cluster
	Dongguan	Electronic products industrial cluster
	Xintang, Zengcheng, Guangzhou	Denim clothing industrial cluster
	Huadu, Guangzhou	Automobile industrial cluster
Shantou	Underclothing industrial cluster	

Table 1, cont.

1	2	3
	Chenghai, Shantou	Toys industrial cluster
	Shenzhen	Electronic products industrial cluster
	Yuncheng, Yunfu	Stone industrial cluster
	Xinxing, Yunfu	Kitchenware industrial cluster
	Huidong, Huizhou	Shoes industrial cluster
Shandong province (10)	Jiaonan, Qingdao	Textile machinery industrial cluster
	Haiyang, Yantai	Sweater industrial cluster
	Penglai, Yantai	Wine industrial cluster
	Wendeng, Weihai	Textile industrial cluster
	Linqing Ki	Axle bearing industrial cluster
	Rizhao 0M	Fisheries industrial cluster
	Zhangqiu, Jinan	Transport equipment industrial cluster
	Dezhou fJJ	Solar water heater industrial cluster
	Liaocheng	Steel pipe industrial cluster
	Linyi	Crop protection machinery industrial cluster
Fujian province (7)	Jinjiang, Quanzhou	Trainers industrial cluster Zipper industrial cluster
	Nan'an, Quanzhou	Plumbing hardware industrial cluster
	Hui'an, Quanzhou	Snacks industrial cluster
	Putian	Jade processing industrial cluster
	Xianyou, Putian	Chinese classical furniture industrial cluster
	Fengli, Shishi	Children's wear industrial cluster
Hebei province (6)	Hejian, Cangzhou	Insulation materials industrial cluster
	Botou, Cangzhou	Metal casting industrial cluster
	Qinghe, Xingtai	Cashmere industrial cluster
	Taocheng, Hengshui	Rubber (applied in engineering) industrial cluster
	Xianghe, Langfang	Furniture industrial cluster
	Yongnian, Handan	Fasteners industrial cluster
Shanxi province (4)	Taiyuan	Stainless steel industrial cluster
	Qingxu, Taiyuan	Radiator industrial cluster
	Dingxiang, Xinzhou	Forging industrial cluster
	Taigu, Jinzhong	Coking industrial cluster
Henan province (3)	Gongyi, Zhengzhou	Aluminum products industrial cluster
		Refractory materials industrial cluster
	Changyuan, Xinxiang	Cranes industrial cluster
Liaoning province (3)	Faku, Shenyang	Ceramic building materials industrial cluster
	Dashiqiao, Yingkou	Magnesium products industrial cluster
	Dandong	Measuring instruments industrial cluster
Hubei province (2)	Yichang	Phosphorus chemicals industrial cluster
	Xiantao	Nonwoven textile industrial cluster
Hunan province (2)	LiuYang, Changsha	Fireworks and firecrackers industrial cluster
	Liling, Zhuzhou	Ceramics industrial cluster
Jilin province (2)	Tonghua	Pharmaceutical industrial cluster
		Steel industrial cluster
Shanghai (1)	Jinshan	Chemicals industrial cluster
Chongqing (1)	Bishan	Motorcycle industrial cluster
Anhui province (1)	Hefei	Household appliances industrial cluster
Heilongjiang province (1)	Lanxi, Suihua	Linen products industrial cluster
Guizhou province (1)	Renhuai, Zunyi	Chinese liquor industrial cluster
Shaanxi province (1)	Baoji	Titanium products industrial cluster
Xinjiang Uygur Autonomous Region (1)	Shihezi	Cotton textile industrial cluster

Source: Li&Fung Research Centre, Industrial Clusters Series, June 2010, Issue 6, pp. 10–11.

According to the Chinese Academy of Social Sciences and the ranking of the top 100 industrial clusters in China one can make the following observations:

a) Uneven geographical distribution is characteristic of industrial clusters across China – industrial clusters are concentrated in the coastal provinces, but those in the inland are emerging – around 80% of clusters are located in the coastal provinces. Forty-two of them are situated in the Yangtze River Delta region and nine in the Pearl River Delta region. Most of the industrial clusters are located in Jiangsu, Zhejiang, Guangdong and Shandong provinces – 60% of the top 100 clusters in 2009.

b) The coastal industrial clusters accommodate a wide variety of products while the central and western areas are specialised in products processed from resources available in the regions – a wide range of products is produced in the coastal industrial clusters, from low value-added industries, such as agricultural products processing, to IT and electric car manufacturing.

c) The biggest industrial clusters in China are mostly engaged in manufacturing – all of the top 100 clusters are engaged in manufacturing. Most of Chinese clusters produce low value-added goods, such as clothes, textile, shoes, furniture, toys and stainless steel. It is worth emphasising that there are no clusters engaged in the services sector. Apparel and textile is the largest sector on the list – 20 apparel and textile clusters were classified on the list.

d) More high value-added industrial clusters are gaining competence – more high-tech industrial clusters entering the top 100 list in 2009. For example, the electric car cluster and the photovoltaic cluster in Wuxi of Jiangsu province, the electronics cluster in Shenzhen and the solar water heater cluster in Dezhou of Shandong. The trend is set to continue, consistent with the government policy to improve the quality of economic growth.

e) New, competitive industrial clusters are constantly emerging – many industrial clusters are emerging as competitive players, challenging the old ones.⁴

According to the data, the cluster represents a major power in its region, as well as nationally, and through the pro-export orientation also shapes the international market. What is very interesting is, however, the composition and structure of this cluster of entities. The vast majority of the cluster operators are small businesses employing up to 60 employees, while there are few large enterprises.⁵ Data from detailed research show that 70% of those responsible for sewing materials are super-small businesses and small, while in the case of production – 60% of the entities. This means that the undoubted success of the cluster corresponds to many small businesses, which through the development of cluster's bond contribute to the increase in the production cluster.

⁴ Li&Fung Research Centre, *Industrial Clusters Series*, June 2010, Issue 6, pp. 12–13.

⁵ Super-small enterprises have less than 20 employees, small enterprises have 21–60 employees, medium-small enterprises have 61–120 employees and the rest have more than 120 employees.

Every Chinese cluster has its own development history and was formed in a different way. However, some main reasons for creating a cluster in China can be presented:

f) *The open door policy and reform* – almost all the clusters were formed after China's opening up. The reforms and open door policies provided a macro-environment that allowed the private sector to flourish and foreign investment to enter China. Before the reforms, all private businesses were officially forbidden.

g) *Long history of production or business activities in a particular sector* – business activity in a given sector preceded many Chinese clusters. For example, the Wenzhou footwear cluster in Zhejiang province has a long history of shoemaking and has built up local production capacity over time.

h) *Proximity to major local markets and infrastructure* – in general, most of these clusters are located in the coastal region, close to international markets. In addition, they are also generally based in a town or major city and are close to main roads, railways, highways, and ports. This location advantage is especially important for export-oriented clusters.

i) *Entrepreneurs with tacit knowledge and skills in production and trading* – the long tradition and knowledge passed down from generation to generation through family and kinship ties have played an important role in cluster formation.

j) *Foreign direct investment and the diaspora* – clusters benefiting from FDI and the diaspora are concentrated mostly on the eastern side of the Pearl River Delta region, in the Dongguan, Huizhou and Shenzhen areas. The economies of these clusters are driven mainly by overseas Chinese and foreign firms.

k) *Natural and human endowments* – such factors are especially important for natural resource-based clusters, such as those in seafood processing, fruits, stone carving, aquaculture, ceramics and furniture.

l) *Market pull* – when China had been first opened up, there was a huge shortage of almost everything as a result of the centrally planned economy. These desperate market needs provided a powerful reason for the existence of numerous clusters that sprang up in a short period of time.

m) *Government facilitation and industrial transfer* – in recent years, because of rising costs, limited land and tough environmental requirements, many coastal clusters have begun to move inland; some clusters in the middle and western regions were formed through such transfers. In some cases, those moves were highly influenced by deliberate government policies; however, such transfers are still based largely on a market choice, in which the government plays mainly a facilitating role.⁶

Clusters in China are successful primarily because they are able to increase the diversity and sophistication of their business activities to achieve greater productivity, efficiency and competitiveness. In the export-led growth model, this ability is especially crucial. The well-known low-cost labour factor and many other elements have contributed to the success of Chinese industrial clusters. These include:

⁶D.Z. Zeng, *How Do Special Economic...*, *op. cit.*, pp. 26–27.

a) *Efficiency gains and lowered entry barriers* – in many Chinese clusters, associated firms operate in different manufacturing segments as well as in related services, and because of that they form well-functioning value chains and production networks with an efficient division of labour. For example, the Datang socks cluster in Zhejiang province comprises 2,453 socks firms, 550 raw material firms, 400 raw material dealers, 312 hemstitching factories, 5 printing and dyeing plants, 305 packing factories, 208 mechanical fittings suppliers, 635 sock dealers and 103 shipment service firms. In addition, Datang Light Fabric and Sock City has 1,600 shops.

b) *Effective local government support* – most Chinese clusters receive help and support from the authorities, although its form and time allocation are different. In most cases, government assistance goes to the clusters that already exist and have already begun to show tangible benefits. Support for clusters from the Chinese authorities may have different ranges but usually manifests itself by:

- *Infrastructure building* – the Chinese government has given high priority to roads, water, electricity and telephone lines, and have tried to build a specialised market or industrial park to facilitate business activities. This market can bring suppliers, producers, sellers and buyers together and help build forward and backward linkages. For example, in Xiqiao the city government set up the South Textile Market in 1985 to replace the original informal market to regulate the local market and stimulate mass production and sales.
- *Regulations, quality assurance and standards setting* – local governments often try to improve services and regulatory environment to facilitate business generation and help clusters operate normally and maintain dynamic growth; they introduce specific regulations, especially those related to investment type, product quality and standards, to ensure that products made in clusters have a market future.
- *Technology, skills and innovation support* – local governments are increasingly emphasising technology innovation and upgrading. Because imitation within a cluster is sometimes easy, firms hesitate to invest in innovation and technology upgrading, and thus government intervention can be justified. For example, in Guangdong, the provincial government has invested RMB 300,000 in each specialised town to build a public technology innovation centre to support clusters' innovation and technology activities.
- *Preferential policies and financial support* – local governments often provide certain incentives, including desirable land, tax reduction or exemption, and access to credits and loans to attract qualified enterprises to clusters.

a) *Knowledge, technology and skill spillovers through inter-firm linkages* – many clusters benefited from state-owned enterprises (SOEs) and FDI, which provided important initial technology and a crucial impetus for clusters' development. The clusters in the coastal region (the Pearl River Delta – clusters in Huizhou and Dongguan) were driven by FDI, especially from the diaspora in Hong Kong, China, Macao, China and Taiwan.

b) *Entrepreneurial spirit and the social network* – many clusters in China have a long history of business and industry, which can help them on their way to development. Because many transactions involve a number of different players in a cluster, the use of formal and, what is even more important, informal contracts is crucial.

c) *Innovation and technology support from knowledge and public institutions* – Besides government's actions, universities and research institutes also provide support for innovation and technology upgrading in clusters. In the case of the cluster in Wenzhou, Wenzhou University has played an important role in supporting technology innovation in the footwear and other clusters. The centre has focused on "green" product development, clean leather production technology and other high-tech research on leather production.

d) *Support from industrial associations and other intermediary organisations* – many industrial associations, especially those in industrial clusters, have begun to play important roles. In Wenzhou, shoemaking firms founded the first shoemakers' association in 1991 – the Wenzhou Lucheng Association. It currently has 1,138 members and 26 branches. The tasks of the organisation are to connect the local authority and firms, introduce new technologies and help improve shoe quality, help firms enter and expand on domestic and overseas markets through marketing and branding services, provide information services, promote trade and provide training in partnership with national footwear institutions.⁷

In conclusion, it can be said that the form of links between production companies such as industrial clusters is expanding in the case of the Chinese economy. Currently, there are many clusters located mainly in the east of the country, which are typically productive in nature. These clusters are complex supply chains, creating a whole industrial city specialising in a particular production. Affiliated entities offer comprehensive production from a given field (e.g., clothing) as each stage of production is realised in the cluster. This design ensures efficient operation of the domestic market and, even more important from the perspective of the Chinese economy, of the international market. Although industrial clusters are traditionally understood as clusters of low-level innovation in many Chinese clusters actions are aimed at increasing innovation actors. A significant role in this process is played by the national and local power, which through a series of varied activities supports the creation of R&D centres in the cluster. Improving innovation clusters, including those not producing traditional high-tech goods, will allow for a better adaptation to changing market circumstances and improvement of the condition of the Chinese economy.

⁷ *Ibidem*, pp. 28–33.

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CHIŃSKIE KLASTRY PRZEMYSŁOWE

Streszczenie: Klastry to coraz powszechniejsza forma współpracy przedsiębiorstw, która daje zrzeszonym podmiotom ogromne możliwości rozwoju i wymiany doświadczeń. Kraje z regionu Azji i Pacyfiku stają się coraz częstszym miejscem ulokowania klastrów, na co nakładają się zróżnicowane czynniki. Region azjatycki jest atrakcyjnym regionem dla bezpośrednich inwestycji zagranicznych, dzięki którym powstaje wiele nowych przedsiębiorstw, a także istnieje tam silna tradycja przemysłowa, zatem klastry tworzą się niejako naturalnie jako następstwo koncentracji wyspecjalizowanego przemysłu na danym terenie. Przykładem koncentracji przemysłu w stopniu większym niż przeciętna są klastry przemysłowe ulokowane w Chinach. Wiele regionów chińskich zajmuje się tylko określoną produkcją (np. tekstylia), która następnie trafia na rynek krajowy i międzynarodowy. Są to niezwykle sprawnie zorganizowane klastry-miasta. Funkcjonuje w nich ogromna liczba małych i średnich przedsiębiorstw, które działając razem, mają większe szanse na osiągnięcie wysokiego poziomu konkurencyjności.

Słowa kluczowe: klastry chińskie, klastry przemysłowe, rozwój.