

## Industrial clusters and the prospects of agglomeration economies in regional development: Review of select works

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### Abstract

The development of industrial clusters as a constructive channel of industrial infrastructure has attracted the attention of policymakers in recent years. Governments adopt 'cluster development' as an approach for industrialisation to reap the benefits of agglomerations through transformation of the traditional systems of activities to new networks ready for competition and innovation. There are many explicit advantages associated with industrial clusters and in a globalised economy in which global value chains link companies across borders, industrial clusters have become an important element of regional innovation systems in the industrial economy of any country as they enable the enterprise to enjoy the benefits of economies of scale in production and distribution. It is in the context, the paper attempts to explore select works on industrial clusters and agglomeration economies and the resultant effects on regional industrial development.

**Keywords:** industrial clusters, cluster development

### 1. Introduction

#### Industrial Clusters and the Agglomeration Economies – An Overview

Industrial clusters are recognised as an important instrument for promoting rapid industrial development, innovation, competitiveness and economic growth. They are defined as groups of interlinked companies, suppliers, and associated institutions providing a related group of products and services in a specific geographic region. They are often concentrated in a region or a town, include companies from different industries that are related to each other in the production of goods and services, and benefit from the cooperation with Government agencies and other institutions in the national and regional innovation systems. Industrial clusters play a pivotal role in the overall industrial development of any economy and the Governments bestow highest priority to attract investments from both domestic as well as foreign sources in its crucial industrial sectors to accelerate inclusive economic growth and development in a sustainable manner. Governments adopt 'cluster development' as a strategy for enhancing the productivity and competitiveness as well as capacity building of the micro and small enterprises in the economy.

There are many explicit advantages associated with industrial clusters. They are increasingly recognised as effective means of industrial development and promotion of small and medium enterprises as they play an important role in their inclusiveness, technology absorption, efficiency improvement, and availability of common resources. The companies located in industrial clusters can operate with higher efficiency, drawing on more specialised assets and suppliers with shorter reaction times than when working alone. They can collaborate with research institutes, technology labs,

productivity centres, venture capitalists, and other providers of business development services. Most clusters are developed as 'production hubs' that they have the entire value chains augmented within the cluster. Each firm is specialised and is connected with other firms through production networks. This increased efficiency and survival rate through strong forward and backward linkages in the value chains. The combination of these potential benefits has a positive impact on the ability of companies to engage in global value chains and enable them to acquire new competences and access to international markets.

Thus, business formation tends to be much higher in industrial clusters as they enable small entrepreneurs to reduce cost of inputs and marketing and enables them to build strong brands that are required to compete effectively in the market. The Governments adopt the cluster development approach for industrialisation to reap the benefits of agglomerations through transformation of the traditional systems of activities to new networks ready for competition and innovation. It promotes cluster formation as they enable the enterprise to enjoy the benefits of economies of scale in production and distribution. In a globalised economy in which global value chains link companies across borders, industrial clusters have become an important element of regional innovation systems in the industrial economy of any country.

### 2. Review of Select Literature

Successful industrial clusters can become the growth and innovation hubs in the economy directing interactive learning and national economic development. Leveraging industrial clusters as a policy instrument fosters competitiveness of the agglomeration economies. They

attempt to run-over the market and institutional imperfections, facilitate economic learning and catch-up, leverage new technologies and knowledge, and accelerate rapid industrial and economic development in transition economies. When successfully managed, industrial clusters can provide an environment for enterprise and innovation to flourish and significantly influence the regional industrial economy of any country. An overview of select literature on the nexus between industrial clusters and regional economic development is presented below:

Lo, Mei-Hor and Dechang Han (2014) <sup>[1]</sup> discuss the cluster taxonomy in relation to competition. Industrial clusters have a prominent role to interconnect companies, specialised suppliers, service providers, firms in related industries, and associated institutions in a particular field that compete but also cooperate. Clusters act as ‘productivity drivers’ and with certain industry linkages, they create a unique set of resources and capabilities to achieve better performance. Local industrial agglomerations provide regional specialisation of economic activities with access to better infrastructure, support services, and wider markets. Thus, it is argued that industrial clusters with localised and competitive strategy should be adopted as development tools in the national as well as global economy. Nibedita Saha, Drahomira Pavelkova and Petr Saha (2014) <sup>[2]</sup> assay how industrial clusters allow firms to stimulate economic growth through increasing their competitiveness and performance of businesses; stimulate innovation through efficient use of research and development; promote new businesses by attracting foreign investments and increasing exports as well as employment opportunities in the domestic economy of Kerala. Industrial clusters enable the firms to increase their accessibility, power, and voice in order to make investment in the specialised infrastructure and new born enterprises can get the benefit of entering into a global market. Thus, it is argued that supporting and creating clusters is a major way for the firms to win in the globalisation race.

S.S. Hugar and S.S. Nadkarni (2013) <sup>[3]</sup> manifest industrial estates as important instruments of local industrial development. An industrial estate is a self-contained geographical area, with superlative infrastructure facilities which are instrumental for balanced regional growth. The main targets are the high value adding small and medium industries, which do not have the wherewithal to invest in developing their own basic infrastructure, but have the capacity to pay for the services. The high quality infrastructure and other

support services in a well-planned layout provides a conducive environment for them and thereby enhances the operational efficiency of the small and medium scale industries operating in industrial estates. Javidnia, Mojtaba, Ahmad Tavangar, Mohammad Ali Astanbous and Zeinab Armoun (2012) <sup>[4]</sup> treat industrial clustering as an innovative development strategy and pinpoint the major factor affecting its competitiveness. Each firm in the industrial cluster becomes part of a large producing network which will increase the competitiveness capability of the small and medium enterprises. Clustering provides utilisation of the efficiencies of scale and aggregation as well as the efficiencies of collective efforts. It can penetrate in a more advance form in the global market and creates competitiveness advantage, economic growth, and export development in the international environment. Thus, it can be stated that a fundamental and sustainable development strategy for directing the small and medium firms towards competitiveness is to develop the principle of industrial clusters.

Catalin Boja (2011) <sup>[5]</sup> states that economic development based on cluster models can bring multiple benefits in terms of regional development and competitiveness in an industry. The major benefits include a more facile access to resources; decreased transportation costs and supply chains; offers a higher degree of specialisation in products and services; technology cooperation or acquisitions; specialised workforce pool and better access to skilled labour; an increased market and opportunities, and finally a more cooperative and highly competitive business environment. Recognising these benefits, innovative policy frameworks should be initiated to support regional industrial development through industrial clusters. Dilip Saikia (2011) <sup>[6]</sup> describes that regional variation in the industrial development is one of the primary causes of the regional disparities in India. He examines what happened to the location concentration of industries across the States in the post-liberalisation period. Industries tend to concentrate in order to realise tangible benefits from being close to other firms and to consumers, market access, thick labour markets, available infrastructure, transportation, raw materials and resources, agglomeration benefits, knowledge and technology spillovers, externalities, etc. The post-liberalisation period has witnessed more concentration of manufacturing industries which suggests India is ‘diverging’ in terms of interregional distribution of manufacturing industries.

<sup>1</sup> Mei-Hor, Lo and Dechang Han (2014). ‘Exploring Competitive Strategies of China Ceramic Tile Cluster in Global Economy’ in *Open Journal of Social Sciences*. Delaware, USA: Scientific Research Publishing (SCIRP). 2(2014): 11-18.

<sup>2</sup> Saha, Nibedita, Drahomira Pavelkova and Petr Saha (2014). ‘Impact of Cluster Activities Accelerate Human Capital and Firms Competitiveness: An Empirical Study of the Clusters in India (Kerala)’ in *Strategic Management Quarterly*. Madison, USA: The American Research Institute for Policy Development. 2(2): 109-126.

<sup>3</sup> Hugar, S.S. and S.S. Nadkarni (2013). ‘A Comparative Study of Cuncolim and Canacona Industrial Estates of Goa’ in *Indian Streams Research Journal*. Open Access Journal. Retrieved at: <http://www.isrj.org>. 3(3): 1-5.

<sup>4</sup> Mojtaba, Javidnia, Ahmad Tavangar, Mohammad Ali Astanbous and Zeinab Armoun (2012). ‘An Empirical Study on the Effects of Industrial Clusters on Small and Medium Enterprises, in *Management Science Letters*. Melbourne Ave, Canada: Growing Science. 2(2012): 1965-1974.

<sup>5</sup> Boja, Catalin (2011). ‘Cluster Models: Factors and Characteristics’ in *International Journal of Economic Practices and Theories*. Open Access Journal. Retrieved at: <http://www.ijept.org>. 1(1): 34-43.

<sup>6</sup> Saikia, Dilip (2011). ‘Pattern of Industrial Location in India under Liberalisation—An Analysis of Organised Manufacturing Industries’ in *International Journal of Research in Management and Business Studies*. Open Access Journal. Retrieved at: <http://www.ijrmb.com>. 1(7): 197-214.

Kazuo Kadokawa (2011) <sup>[7]</sup> scrutinises whether the 'Marshallian Advantages' localised in a region collectively forming an industrial cluster advantage. Marshall proposed four localised advantages residing in industrial agglomerations: knowledge spillover, a skilled labour pool, development of supporting industries, and shared input resources. The study investigates whether such location benefits affect the actual location behaviour of the firms which shapes unique regional advantages. The formation of local cluster is vital for the success of regional economies in terms of the benefits including specialisation of their own production, ease of procurement, diffusion of technologies, and public policy support. Reza Mohammady Garfamy (2011) <sup>[8]</sup> considers industrial districts as a dynamic approach to regional industrial development. Industrial district as a corporation coordinates, regulates, and stabilises economic activities and simultaneously functions as a resonance for change. Geographically concentrated and specialised industrial alliances provide immense opportunities for worker mobility, technological upgrading, and infrastructural improvements. He observes that industrial policies should be reoriented for geographic concentrations for regional industrial development.

Rinku Das and Ashim Kumar Das (2011) <sup>[9]</sup> gauge that cluster development will provide competitive advantage to the firms in terms of productivity, innovation, and formation of new businesses which will definitely have its impact on the rural economic and industrial development. Innovations like the setting up of General Industrial Parks, Product Specific Industrial Parks, Industrial Estates, and Special Economic Zones (SEZs) has been initiated by the Government of India to give an impetus to its rural industrial base which provides opportunities for the firms to work and grow in their host place. The establishment of industrial clusters, specially as a strategy for regional economic development, helps the poor growth in the country. Grace T.R. Lin and Chia-Chi Sun (2010) <sup>[10]</sup> attempt to ponder the major driving forces for the growth of industrial clusters. They identified local demands and factor conditions are the major causal driving forces and the factors such as related and supporting industries, firm structure, strategy, rivalry, and Government support as the indirect forces leading to cluster development. Clusters can be seen as a source of national competitiveness, serving to upgrade

productivity, new business formation and innovation, and advance marketing or customer relations. They stimulate innovation and improve productivity and allow for the potential of inter-firm learning and cooperation.

Christian H.M. Ketels and Olga Memedovic (2008) <sup>[11]</sup> attempt to probe how clusters can be leveraged for economic policy. Cluster-based policies leverage local assets, capabilities, specialised knowledge, skills, infrastructure, and supporting industries in enhancing productivity as the key determinant of sustaining high levels of prosperity in a location. One of the major characteristics of a cluster-based economic development approach is its concern with the specific conditions present in a location or country. Clusters can enable companies to leg up the business environment quality to reach higher economic performance and thereby endow higher productivity. The dynamics of clusters can be fostered through a mix of networking, collaboration, and competition. Kui-Hsien Niu, Grant Miles and Chung-Shing Lee (2008) <sup>[12]</sup> deem that the development of regional clusters facilitates the competence and competitive advantage of the firms by sharing resources, innovative capabilities, and knowledge. Industrial clusters offer a relatively favourable environment for the firms to more easily pool resources, investments, and synergies necessary for them to become competitive in the global arena. Once a cluster successfully pools the resources and develops the core competences, the phenomenon of networks of clusters is likely to emerge to share complementarities across the national and geographic boundaries. The study thus explores inter-cluster network structure that enhances the global competitiveness and innovation of both the firms and clusters in an emphatic manner.

S. Venkataramanaiah and S.P. Prashar (2007) <sup>[13]</sup> explicitly observe that industrial clusters can help the Small and Medium Enterprises (SMEs) to improve their inter-firm relations and competitiveness by facilitating various incentives and support systems. The performance and presence of SMEs have been mended through the clusters and they could be significantly upgraded to enhance the levels of productivity and participation in international markets. Geographical concentration of similar or complementary enterprises speeds up the dissemination of best practices through 'demonstration effect.' In India, where infrastructure and provision of finance is still largely provided and regulated through the Government, the involvement of Government institutions will not only be necessary but also has to be innovative to

<sup>7</sup> Kadokawa, Kazuo (2011). 'Applicability of Marshall's Agglomeration Theory to Industrial Clustering in the Japanese Manufacturing Sector: An Exploratory Factor Analysis Approach' in *The Journal of Regional Analysis and Policy*. The Mid-Continent Regional Science Association. Open Access Journal. Retrieved at: <http://www.jrap-journal.org>. 41(2): 81-100.

<sup>8</sup> Garfamy, Reza Mohammady (2011). 'Industrial District as a Corporation' in *Theoretical and Applied Economics*. Bucharest, Romania: General Association of Economists from Romania. 18(3): 77-94.

<sup>9</sup> Das, Rinku and Ashim Kumar Das (2011). 'Industrial Cluster: An Approach for Rural Development in North East India' in *International Journal of Trade, Economics and Finance*. Open Access Journal. Retrieved at: <http://www.ijtef.org>. 2(2): 161-165.

<sup>10</sup> Lin, Grace T.R. and Chia-Chi Sun (2010). 'Driving Industrial Clusters to be Nationally Competitive' in *Technology Analysis & Strategic Management*. Wales, United Kingdom: Francis & Taylor Group. 22(1): 81-97.

<sup>11</sup> Ketels, Christian H.M. and Olga Memedovic (2008). 'From Clusters to Cluster-based Economic Development' in *International Journal of Technological Learning, Innovation and Development*. Olney Bucks MK, UK: Inderscience Publishers. 1(3): 375-392.

<sup>12</sup> Niu, Kui-Hsien, Grant Miles and Chung-Shing Lee (2008). 'Strategic Development of Network Clusters—A Study of High Technology Regional Development and Global Competitiveness' in *Competitiveness Review: An International Business Journal*. Eberly IUP, Indiana: The American Society for Competitiveness. 18(3): 176-191.

<sup>13</sup> Venkataramanaiah, S. And S.P. Prashar (2007). 'Enhancing the Competitiveness of SMEs through Industrial Clusters: The Indian Experience' in *International Journal of Technology Management and Sustainable Development*. Bristol, United Kingdom: Intellect. 6(3): 227-243.

cater to the specific needs of SME clusters. Hsein-Che Lai, Yi-Chia Chiu and Horng-Der Leu (2005)<sup>[14]</sup> ransack the effects of industrial clusters on the innovation capacity of firms under the framework of regional economic policies. An industrial cluster provides a set of knowledge inputs that make for the technological infrastructure supporting innovative initiatives in the economy. Firms located in an industrial cluster enjoy strong local demand, reduced search costs, technology spillovers, specialised labour, infrastructure benefits, and informational spillovers. These factors generate positive externalities from knowledge spillovers, transactional efficiencies, and cluster-level scale economies. The authorities should therefore initiate suitable policies to leverage the cluster advantages for the rapid industrial as well as regional economic development.

Tai-Shan Hu, Chein-Yuan Lin and Su-Li Chang (2005)<sup>[15]</sup> are of the view that nurturing industrial clusters is essential for the economic development of less developed countries. Development of knowledge-based economy, globalisation, and international competitive pressure has necessitated the establishment of local innovation clusters with agglomerative effect on the domestic economies. Location-specific clusters offer ample space for the development of Small and Medium Enterprises (SMEs) or new start-ups which stimulate new industrial foundations for regional economic growth. Through spatial proximity and unbeaten industrial infrastructure, clusters can stimulate compatible spillover effects and thus become an effective tool for integrating industry and regional development.

Paolo Guerrieri and Carlo Pietrobelli (2004)<sup>[16]</sup> investigate some plausible models of evolution of industrial districts and clusters focusing on the concept 'technological regimes.' The changes in technological paradigms and trajectories that crucially affect foundations of competitiveness are increasingly shaped by the internationalisation process. Firms traditionally operating within the industrial districts need to reorganise their knowledge linkages from a cluster-based approach to a global and broader approach. Thus, systemic forms of integration are emerging to combine geographic dispersion with localised concentration. Sanjoy Chakraborty (2004)<sup>[17]</sup> construes the appropriate framework for understanding industrial location in the

post-reform India is 'concentrated decentralisation.' The key to long run inter-regional change is the role of industrialisation, especially its spatial manifestation, or what is being called geographic concentration or clustering. He found that the most successful pre-reform districts are not the most successful post-reform districts. There has been a shift in geographical focus whereby new investments seek locations within the existing leading regions or clusters. The situation is concentration with dispersal or 'concentrated decentralisation.'

### 3. Major observations and Conclusion

It can be observed that some sort of customised and industry-specific policy measures that could endeavour in reaching its objectives through state-of-the-art industrial infrastructure, encouraging eco-friendly enterprises, strengthening the MSMEs, inculcating entrepreneurship development, enhancing skills, simplification of rules and procedures, etc. must be initiated with a clear cut vision, objectives, and strategy so as to transform the industrial sector of the country into a more dynamic and progressive industrial economy with faster, inclusive, and sustainable economic growth. Development of industrial clusters as an innovative business strategy provides a strong industrial environment, covers up the inadequacy of industrial infrastructure in the backward areas and thus finds a solution to the problem of low level of industrialisation in the regional economy of any country. The development of such clusters will encourage the pace of modernisation so that the industrial units will become more competitive and investor-friendly in the backward regions of the country. With a clear and pragmatic approach, the Governments of developing countries are adopting various policy measures for cluster-based industrial development so as to utilise fully their immense industrial as well as agglomeration potentials for making the country a vibrant industrialised economy.

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