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The Empirical Study on the Role of MSMEs Cluster to the Local Economic Development

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ABSTRACT

Purpose: The present empirical study attempted to analyze various factors and stakeholders of the Liluah metal casting cluster and its impact on local economic development. In addition, we explained the role of COVID-19 in this MSMEs cluster.

Design/Methodology/Approach: To achieve the set of objectives, the research has used purposive sampling. The data were collected through structured questionnaires and in-depth interviews with firm owners. The primary data have been used and secondary data collected through various sources for the study.

Findings: Liluah metal casting cluster plays a crucial role in the local economy in terms of employment and business prospect. The study also found that the manufacturing units and annual turnover increased in the last two decades, and the number of laborers decreased rapidly. Despite the huge scope of improvement in the market, technology, skill training, etc., the present cluster is suffering from a lack of capital, the latest technology, skilled workers, pollution, and competition with foreign products. Further, possibilities of innovation practices in the cluster can be achieved as far as the development of the cluster is concerned.

Research Limitations: The study has several limitations. For instance, the study has analyzed the impact of the cluster on the local economic development based on the firm owners' perspective and attempted to explain various challenges and prospects. Future, there is a need to integrate various stakeholders like laborers, government institutions, and intermediaries with other allied manufacturing sectors. The sample was selected only for the Howrah district's Liluah metal casting cluster owners.

Managerial Implications: Practically, it highlighted the challenges and prospects of the present cluster. Therefore, the study suggested that innovation practices can be led to positive growth of the cluster where research and development can play an important role.

Originality/Value: The empirical study mainly focuses on the Liluah metal casting cluster of the Howrah district. The research paper is based on the Ph.D. thesis, and all the data and information mentioned here are original.

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Introduction

The performance of firms and external mechanisms are helping to establish a good network with other firms towards expanding the employment generation, production capacity market, etc., in a region as well as regional innovation systems. Recent research also suggested that a good network or externalities of manufacturing are encouraging to form of an economic agglomeration.

Montiel & Delgado-Ceballos (2014) in a recent study also found that the critical aspect of the clustering or agglomerating of economic activity is the linkages that exist among firms that belong to different industries. Therefore, it is difficult to deny some positive impacts of externalities that can affect the firm's production. In another way, some recent studies also found an adverse effect of the externalities which can create a boundary between firms regarding knowledge distribution, labor sharing, manufacturing skills, etc. Taking into consideration of the positive impact of the externalities; the economic development of regions is a collective process of firms (Boschma & Frenken, 2011).

Further emphasizing the importance of the collective process of firms in an area, stating that similar to the economies of scope multi-product that firms achieve, regions can benefit from geographies of scope if they host economic activities that are related. Based on location our major focuses are on the network between firms which is considered an essential parameter for regional development. Also, for claiming the identity of firms; clusters should not be consented to lessen the importance of location.

According to the researcher, "possesses an identity based on the characteristics business to ascribe to it and can be more elaborating that implied by prestige" (Jones, 1998). In a particular location, existing firms may flourish, and new firms appear just because some specific criteria provide certain facilities which accelerate the firm's production function. Not only are the location, and quality of labor affecting the firm's production as equivalent to sufficient labor and rich knowledge available in the local area. So, location and quality of work are crucial factors to measure the growth of firms. There is a geographical sense of place for businesses to identify with, develop and sustain on behalf of all local shops and resident communities (Jones, 1998).

Depending on the location and externalities firms create a lot of opportunities to provide sustainable growth to their surrounding people. Therefore, it is widely accepted that the development of a region cluster are covering broad areas to ensure employment and financial opportunities for its stakeholder and residents.

In the extremely competitive global economy, small elements of the design of the organization that is chosen by the top management cost very high, and the delayed reaction of management can be even more damaging to the company's position in the market. Given the pace of implementation and adoption of innovations as well as sophisticated technology and market knowledge. In these conditions, organizational design becomes an essential instrument for anticipating and not only for monitoring and responding to the demands arising from changes in the environment (Miles & Scaringella, 2012).

Empower the SMEs by inviting newer technologies and departing the old mechanism this provides them with a favorable environment in the context of globalization. In the era of globalization, knowledge is playing a predominant role and it needs to enquire and assess the importance of SMEs and ensure their sustainable growth. The need today is also to leverage modern technologies to harness human capabilities through the process of increased communication, cooperation, and linkages, both within the enterprise as well as across enterprises and knowledge-producing organizations.

In recent decades with the increasing global economic competition, Industrial clusters have been known as an economic growth engine and a tool for employment, so they have an essential role in the growth and development of countries. The importance of industrial clusters is their need for more investment for their survival and competition capability than big firms to new products and processes. Therefore, industrial groups are a potential resource for achieving new ideas and innovation. Most countries demonstrate the active and positive roles of these institutions in entrepreneurship, technology, and economic development, increasing technological innovation and employment.

Literature Review

After the innovative idea of the cluster by Marshall, it has shown more interest for academicians and policymakers. For a long time, it has been espied that clusters could form in a community and have their possibilities of development (Kasabov, 2010) where all firms streaming by inter-firm networks even share economic opportunities and social presence. Therefore, many researchers postulated their strong argument for the development of firms on community practices, (Brown & Duguid, 1991; Easterby-Smith et al., 1998; Lave & Wenger, 1991; Swan et al., 2002) essential firms organization (Cooke, 1997; Lagendijk & Lorentzen, 2007; Lovering, 2001, 2007; Macleod & Jones, 2007).

However, the notion of communities might be applied to small firms but may not be practiced for high technology firms. Gittelman & Kogut, (2003) argue that the development chances of a firm are rarely explored but for top technological firms contested nature of knowledge takes advantage of firms' development. In another way, the researcher emphasized a firm's interlink concerning the agglomeration of professionals. Some academicians postulated their majestic thoughts on clusters with the growing literature of industrial groups and regions in a geography where the problem of assuming that clusters are collective social entities has been recognized (Lagendijk & Lorentzen, 2007; Lovering, 2007; Macleod & Jones, 2007).

The analysis of cluster growth in a community approach has assumed that a cluster may form with a group of firms. For the identification of a cluster on a community basis, Porter's argument was that "A critical mass of companies in a particular location" (Porter, 1998). However, the community cluster plays an important role in shaping their reputation and visibility, knowledge generation and dissemination, collective learning, and the ability of the member organizations and individuals to generate a common identity through collaboration (Kasabov, 2010), or a group of individuals and organizations that share a mindset and conventions (Cooke, 1997). Therefore, clusters provide an enormous contribution to regional development.

For exploring more development within communities some practitioners and policymakers have emphasized proximity (Lagendijk & Lorentzen, 2007; Shaw & Gilly, 2000; Torre & Rallet, 2005). They argued that two types of proximity are present in cluster development; Organizational proximity and Geographical proximity. For becoming a successful cluster, firms need to be a healthy relationship between geographical proximity and organizational proximity otherwise network is growing weak.

At present time most researchers or policymakers have taken up an interest in clusters and it is established that a regional development cluster plays a critical role depending on time and space. Instead of community organizations for .luster development, some groups of firms have been witness to cluster decline. Some factors affect firms directly such as; Demand, Competition, weak organization, Proximity, Disruption, cluster movement, etc. For example; Silicon Valley faced competition with Japan's computer Hardware accessories in the early 1980s. (Best, 2011; Langlois & Steinmueller, 1999) and Biotechnology clusters in North West England (Kasabov, 2010).

However, for the development of inter-firm networks, many indicators are crucial. Laborers' indicator has an important role because of the difference in wage rate; competition among laborers, and changes in the workplace within clusters, therefore it impacts knowledge to share, special skill, and different business plan. So, the individual firm faces the problem of competition. Therefore, the life cycle of a cluster is different from the industrial life cycle. On that basis, Menzel & Fornahl (2010) argue that different growth paths of the computer industry in Boston and Silicon Valley indicate that the cluster life cycle is not the local representation of the industry and argue that the diversity and the heterogeneity of knowledge within the cluster provide the foundation for the cluster's development. According to them, clusters decline when the heterogeneity of knowledge cannot sustain.

The emergence or growth of a potential cluster might be halted or may decline at any point in the life cycle (Østergaard, 2008). In the discussion of this cluster lifecycle Adoptive cycle theory. (Martin & Sunley, 2011) needs to be discussed where the four phases of the cycle exist. According to them the four primary aspects of the Adoptive Cycle Model are exploitation, reorganization, conservation, and release. However, the lack of recycling

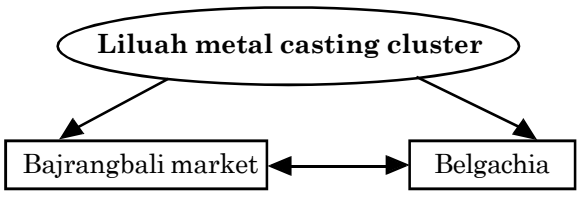
phases and less number of substantial firms put towards low interconnectivity and rigidity indicates the poor adaptive capability which is a more important characteristic of a cluster to become a thriving cluster. Notwithstanding we will explore the causes of firms declining to groups thrust according to adoptive capabilities like; financial retreat, environmental hazards, technological disruption, and market situation. Technical disorders, in particular, change the underlying knowledge base of an industry and can quickly lead to a decline if the cluster firms are not able to move into the new technology (Christensen, 1997; Dalum et al., 2005; Steven Klepper, 2010; Walker & Storper, 1989).

In contemporary clusters, immediate effect changes their adaptive capabilities and they face tremendous challenges. Grabher (1993) suggests that three locks-in problems are liable for this situation. Such as; Functional lock-in refers to a hierarchical connection in inter-firms with market and R&D, and Cognitive lock-in mention that common knowledge sharing within firms makes them unable to see outside changes, and Political lock-in deals with existing industry and maintains their effort. These locks in might affect their production creativity. Most leading firms overcome this situation with their economic power, production substitution, production capacity, and knowledge spillover. In this sense, within a cluster, a few leading firms have emerged over time, and today they dominate local production networks (Cainelli & Zoboli, 2004; Guerrieri & Pietrobelli, 2004; Iammarino & McCann, 2006; Randelli & Boschma, 2012). We now discuss the existence of an old cluster since a very earlier age and its impact on the local market. Baptista & Swann (1998) argued that industrial clusters and industrial districts are very positive for the economic development of the respective location. In particular places, industrial clusters provide high technological innovation, more employment generation, and influence economic growth. Sometimes it leads to a misconception about some industrial groups where existing clusters producing materials with deficient technology are relegated backward due to a competitive market. Albeit, there is empirical evidence for a positive impact of local industrial firms on growth and innovation activity (Brenner & Gildner, 2006). Steven Klepper (2010) assumed that technological development firms show a specific life cycle with a decline or a stagnation of demand after some time.

The long-term implications of older clusters have been analyzed to a greater extent. In a broader context, policymakers take a tremendous role to discuss the path. It has been observed that for the establishment and capturing market a 50 to 100 years old cluster takes more advantages than new entries (Brenner & Gildner, 2006). Perhaps, the current market is defined by a high-production system, temporary and part-time employment, and a flexible workforce, which is mainly embraced by enterprises seeking to reduce labor costs in the face of fierce competition. As a result, the manufacturing sector is severely impacted and susceptible as a result of this circumstance. In an old cluster, lack of new technology, lack of product knowledge, and unavailability of skilled labor after a certain period, the old cluster goes to moribund rather than the new entries with high tech. For degradation of an older cluster production found that quick changes of some disruption, lock-in, key technologies, and competitive market pose a threat to clusters. So, it is assumed that older clusters have a positive impact on local economic performance, but this has some limited way and is observed for a short period (Brenner & Gildner, 2006).

Research Methodology

To achieve the set objectives of the research, we collected primary data through survey and secondary data by reviewing literature and other sources. In the South Bengal region, there was a good number of industries and researchers conducted a study on Liluah metal casting cluster by the production of output, employment generation, and annual turnover by purposive sampling. The majority of the firm units were located in Bajrangbali market and Belgachia of Howrah district.



The primary data was also collected through a structured questionnaire to interview owners. In addition, sources of raw materials and supply of production output were explained to understand

firm linkages among the manufacturing units. Apart from that, existing completion in the market, the importance of types of machinery, and the role of research and development were explained to understand the role of technology and innovation in the metal casting cluster. The researcher tried to attach to the field as much as possible to get a rooted sense of the cluster problems and challenges.

To understand the manufacturing nature, employment generation, value chain analysis, and process of metal casting the researcher collected secondary data from various institutional reports. This was given the extent to which the clusters were spreading and their volume in the region. Secondary sources of information were explored to understand the nature of production in this cluster concerning employment generation in the region. The study attempted to explore the processing of metal casting and trends in the last two decades based on secondary data. Most of the secondary data were collected from online sources such as:

a. The Energy and Resources Institute, (2016)

b. Howrah, Brief Industrial Profile of Howrah District reported by GoI ministry of MSME, Carried out by MSME- Development Institute (Ministry of MSME, 2017).

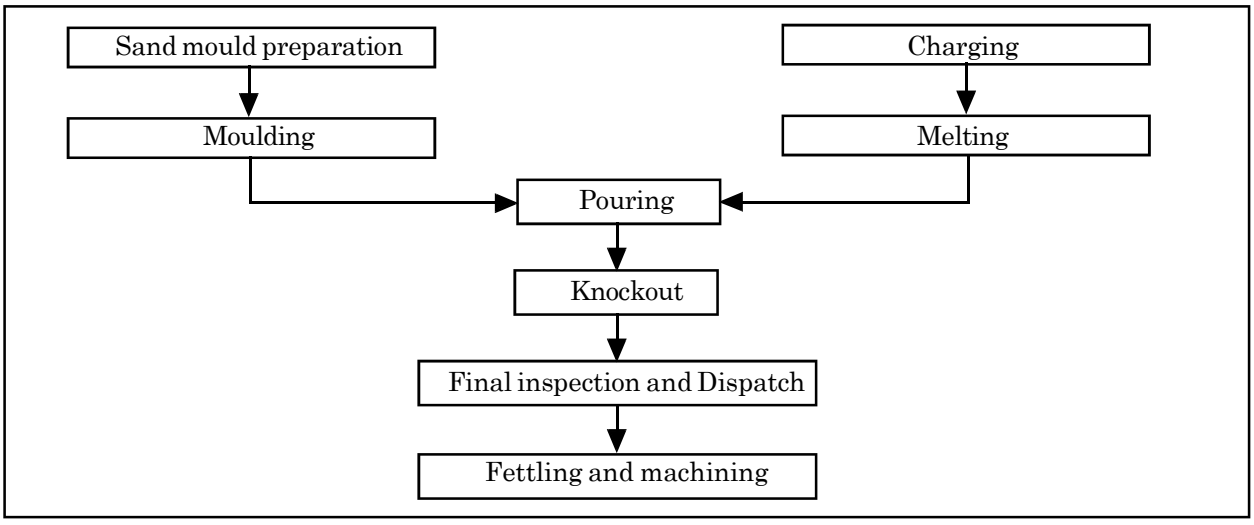
Results and Discussions

In the result and discussions, we have analyzed various factors that are important in the cluster and the local economy as well. To understand the manufacturing process, in the first section we have focused on the process of metal casting and every step has been explained in detail. In the next section, one table has dedicated to showing the trends of the previous two decades in terms of the number of firms, the number of workers, and the annual turnover of the cluster. Further, inter-firm linkages have been analyzed to understand the linkages of firm units within and outside the cluster. Therefore, in this section, we particularly focus on firm linkages within and outside the cluster for raw materials, laborers, information related to the market, financial support, and machines/equipment.

Later, the medium of backward and forward linkages will be discussed in another section to understand the cluster linkages with the transport and agricultural sector. To get an idea about the role of technology and production and process innovation in the cluster, a separate section has been dedicated to discussing competition with foreign products, technology, related problems, research center/incubator, and the role of labor in product and process innovation in the metal casting cluster. In the final section, the authors attempt to identify some existing policies and recommendations for cluster development.

Sand mould preparation: Fresh sand mixed with bentonite and other additives to bring green color sand. Few firms had particular mixer machines

Process of metal casting (step by step):



Source: The Energy and Resources Institute, (2016).

to prepare green color sand but most of the firms manually made green color sand for sand mould preparation.

Moulding: This was a shape or pattern where the green sand was pressed manually. This mould had two parts, one was the upper half and another was the bottom half and both were enclosed by a box or flask. The moulding would be done manually or by using moulding machine. The majority of the small firm units were using hand moulding and few manufacturing units accessing moulding machines.

Charging: Raw materials including pig iron, and scrap were charged into the cupola furnace for melting. The majority of the firms were charging manually and other firms were charging by using machines or mechanical methods.

Melting: After the charging, the next step was melting. In this process, metals were melted into the cupola furnace. Here, the operator visually examined the melting temperature and this step was crucial for the metal hardness.

Pouring: After melting the molten metal was poured into moulding manually or using overhead cranes.

Knockout: After melting the mouldings were kept in a safe place for cooling. Some manufacturing units were done manually and some units were using a vibratory knock-out machine.

Fettling and machining: In this process castings were separated from the moulding after melting. Castings were becoming hard and short as per the size and design.

Finishing: finishing involves shot blasting and cleaning of the castings.

Final inspection and Dispatch: The metal casting was going through under final inspection and is ready to deliver for the market.

Trends in the last two decades

Despite being one of the oldest in West Bengal, the cluster had been experiencing major changes year by year. Initial years of its journey to the present time or almost two centuries of existence, the number of firms, the number of workers, and the turnover of the cluster were fluctuating.

Table No. 1: Trends of the cluster in the last two decades

	2007	2016
Number of firms	300	320
Number of workers	30000	15000
Annual turnover (Million)	15000	135000

Source: Cluster observatory 2007, TERI 2016, p.1.

It was important to note that in the last two decades the number of firms had almost remained the same but the number of workers had declined drastically by almost half while the turnover is increasing surprisingly by nine times compared to the last decade. As per the available source, the workers left the job due to pollution, unhealthy working environment, low wages, and a huge workload. As a result, the dependency of the workforce was shifting slowly towards machines and technology day by day.

Inter-firm linkages of the cluster

Source of raw materials and supplying of production output

In the cluster, the raw materials are mainly used for production purposes. Raw materials like pig iron, coal, stone, and wood came from different states of India and even from outside India. Most of the raw materials are reached at firm premises through various sources. Here, we are explaining the sources of raw materials into three categories; within the cluster, outside the cluster, and importing.

Table No. 2 revealed that a very less number of firms used the sources from within the cluster. Only 12 percent of owners used other shops within the cluster to buy raw materials and only 2 percent of owners bought raw materials from traders, agents, etc. Regarding buying raw materials for production purposes, the data showed that the majority of the firms used sources from the outside cluster for buying raw materials. Less than 6 percent bought from traders and only 2 percent agreed that they bought either from their shop or even another shop. Nearby 40 percent of owners bought raw materials by using other shops,

Table No. 2: Sources of raw materials in the metal casting cluster

		Frequency	Percent
Within cluster	Other shop	6	12
	Traders	1	2
	Other shop + Trader + Agent	1	2
	Not applicable	42	84
	Traders	3	6
Outside the cluster	Other shop + Trader + Agent	19	38
	Trader + Agent	27	54
	Own shop + Other shop	1	2
Import from other countries	Agents	30	60
	Traders + Agents	4	8
	Not applicable	16	32

Source: Primary data collected by authors, 2021

traders, and agents from the outside whereas more than 50 percent of the firm owners agreed that they purchased raw materials through traders and agents.

Raw materials like stone are used for manufacturing purposes and imported from Bhutan. Agents and traders were playing a crucial role to supply raw materials to firms. The above table suggests that 60 percent of owners purchased raw materials through agents and only 8 percent of the respondents purchased through traders and agents both. The remaining number of firm owners purchased raw materials from within the cluster or outside the cluster for the manufacturing process.

Supplying of production output in the market

The production output is supplied to the local market or national or even international market through various sources. In this case, supplying production output the authors categorized it into three parts supplied within the cluster, outside the cluster, and exporting of production output.

In the case of supplying production output within the cluster, the above data shows most of the firms were not using the sources within the cluster for supplying production output. Less than 10 percent of the respondents agreed that they supplied production output through other shops and traders. More than 90 percent of respondents said they supplied the production output to outside clusters or exported it through various sources.

Also, the majority of the firms depended on the outside cluster for supplying their production output. Only 6 percent of the owners agreed that they supplied the output outside the cluster through traders and 60 percent of them said they supplied the production output through other shops, traders, and agents. Where 32 percent of respondents said they used traders and agents to supply production output outside the cluster and only 2 percent used their shop or other shops to supply products outside the cluster.

In another case, about 50 percent of the firm owners exported their product through agents and only 6 percent agreed that they supplied through other shops, traders, and agents. Where, 12 percent of respondents revealed that they supplied production output through traders and agents, and the remaining 32 percent of the respondents have not exported their production output and sold in the local and domestic market.

Depends on other firms within the cluster

In this section, we tried to understand firms' dependency on other firms within the cluster and outside the cluster. As far as inter-firm linkages are concerned, therefore, it is relevant to explain crucial indicators like raw materials,

Table No. 3: Supply of production output

		Frequency	Percent
Within the cluster	Other shops	2	4
	Traders	1	2
	Not applicable	47	94
Outside the cluster	Traders	3	6
	Other shop + Traders + Agents	30	60
	Traders + Agents	16	32
	Own shop + Other shops	1	2
Export of production output	Agents	25	50
	Other shops + Traders + Agents	3	6
	Traders + Agents	6	12
	Not applicable	16	32

Source: Primary data collected by authors, 2021

laborers, information related to the market, technology/machines, etc.

Table No 4: Inter-firm linkages within the cluster

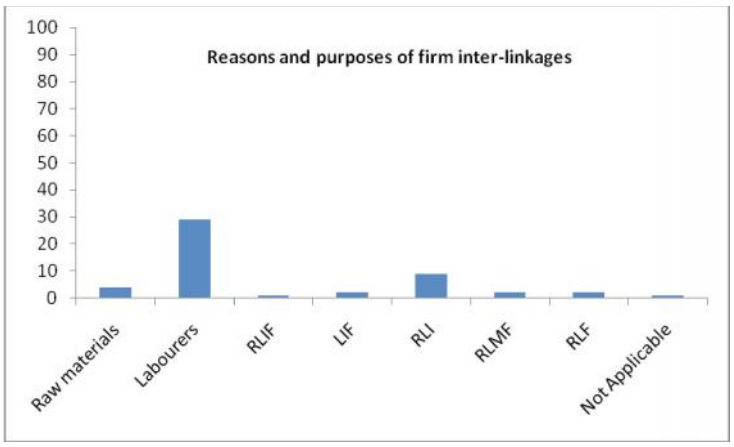
	Frequency	Percent
Yes	49	98
No	1	2

Source: Primary data collected by authors, 2021

The above table suggested that the majority of the firms were dependent on other firms within the cluster for various reasons. 98 percent of the respondents agreed that for raw materials, laborers, technology, and other purposes they were dependent on other firms within the cluster and only 2 percent of the respondents did not depend on other firms within the cluster.

The given figure has revealed that a good number of firms were interlinked with other

Figure 1: Reasons and purposes of firm inter-linkages



Source: Primary data collected by authors, 2021.

*R – Raw materials, L – Labour, I – Information related to the market, F – Financial support, M – Machines/Equipment

firms for labor purposes. Apart from that, almost 20 percent of the firms agreed that they depended on other firms only for raw materials, laborers, and information related to the market. Where very few firms were dependent on other firms for various purposes related to finance and machines or technology.

Table No. 5: Inter-firm linkages outside the cluster

	Frequency	Percent
Yes	50	100

Source: Primary data collected by authors, 2021.

The Liluah metal casting cluster depended on other firms outside the cluster for production purposes and development purposes as well. The available information shows that all the firms were interlinked with other firms outside the cluster. Like interlinkages within the cluster, they depended on the other firms outside the cluster for the same purposes.

The above diagram revealed that unlike inter-linkages within the cluster; firms were more diverse. The majority of the firms were dependent on other firms not only for a single reason but multiple causes were involved. Based on the diagram the authors suggested that a good number of firms were interlinked with other firms outside the cluster either for raw materials, labor, information related to the market, finance, and machines or types of equipment.

Backward and forward linkages of the cluster

In this section, we are analyzing the backward and forward linkages of the cluster. In the manufacturing process, backward linkages like raw materials, labor, etc are playing an important role and we explained what kind of factors were involved. In the forward linkages or supplying of production output, we explained various factors and their importance in the development of the cluster.

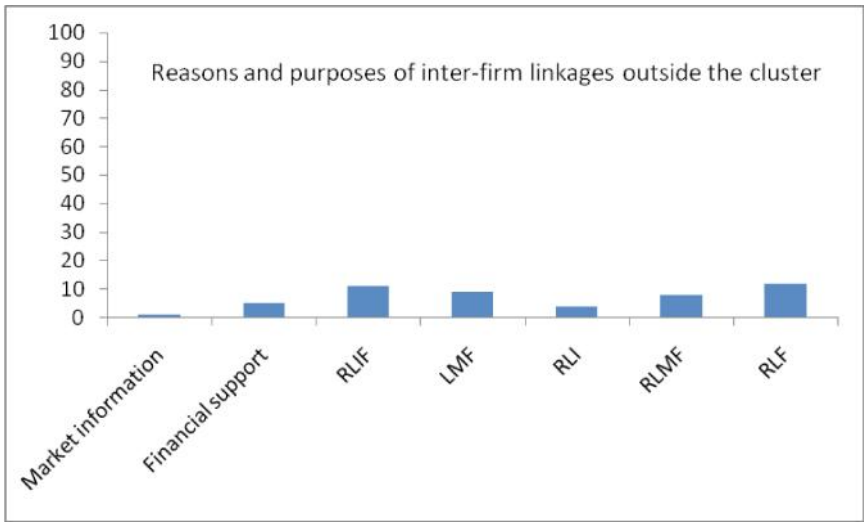
Table No. 6: Backward and forward linkages

	Frequency	Percent
Yes	50	100

Source: Primary data collected by authors, 2021.

Based on our above discussion, we tried to understand the status of backward and forward linkages in the cluster. However, the available information revealed all the firm owners agreed that they had backward and forward linkages with other sectors for production purposes.

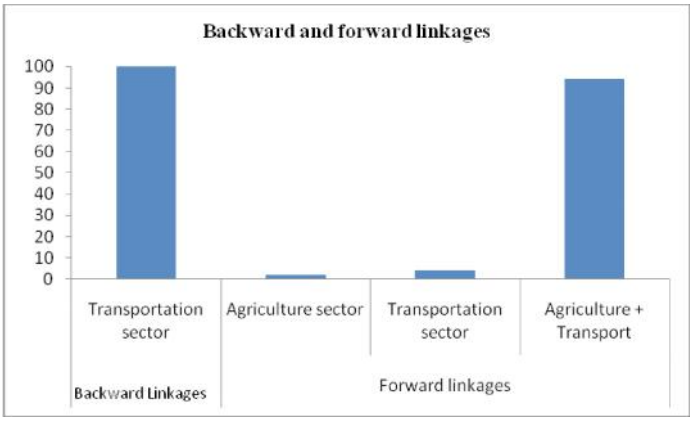
Figure 2: Inter-firm linkages outside the cluster



Source: Primary data collected by authors, 2021.

*R – Raw materials, L – Labour, I – Information related to the market, F – Financial support, M – Machines/Equipment

Figure 3: Backward and forward linkages in the cluster



Source: Primary data collected by authors, 2021.

The above diagram suggested that in the backward linkages all firms used only the transportation sector to supply raw materials and laborers in firms. Where forward linkages played a crucial role in supplying production output to the domestic and international markets. The majority of the respondents claimed that after finalizing the product, it was delivered to various markets by the transportation sector. Later, the product was used in the agriculture sector and transport sectors. Very few respondents said that after finalizing the product, the party or buyers directly used it in the agricultural sector. Where less than 10 percent of respondents said buyers used the transportation sector to collect the final product and then they supplied it for various purposes as per requirements.

Role of technology and Innovation in the cluster

In the contemporary era, manufacturing units and the quality of products are significantly dependent on technology and innovation. Where a technology impacts their production output and product quality depends on product and process innovation. Therefore, manufacturing units equipped with technology and innovation are captured by the market where other manufacturing units are struggling to sell their products. As a result, manufacturing units with labor capital are facing huge competition with highly technological and innovative manufacturing units. In this section, the authors are trying to explain issues related to technology and its impact on innovation and production output.

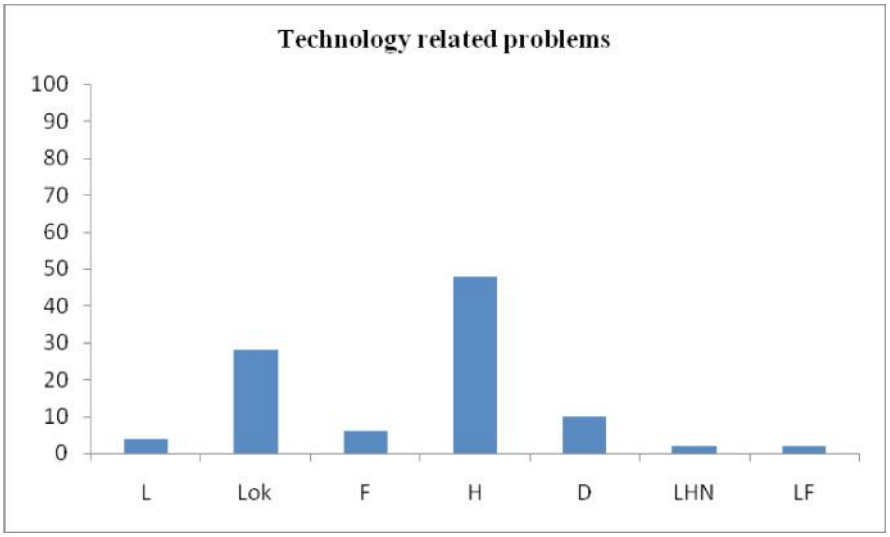
Table No. 7: Facing competition with the foreign products

	Frequency	Percent
Yes	23	46
No	27	54

Source: Primary data collected by authors, 2021.

The available information from the given table shows that facing competition with the foreign product was significantly high. About 50 percent of the respondents agreed that they faced competition with foreign products to sell in domestic and international markets. The majority of the respondents said that competition with foreign products was enormous, particularly with Chinese products. It is also important to note that products from China were machine oriented. Therefore, the quality was good and available in the market at a cheap rate. Coming to the Liluah metal casting cluster, the production units were highly labor-oriented and product quality was not good as Chinese products. As a result, production was costlier than foreign products, and less demand in the domestic and international markets. Where about more than 50 percent of respondents said they never faced competition as their products were made as per buyer's requirements.

Figure 4: Technology-related problems



Source: Primary data collected by authors, 2021.

L - Low productivity due to obsolete technology, LoK - Lack of knowledge information and advanced technology, F - Few/no machinery suppliers in the area, H - High cost of new machines/technology, D - Difficult in repair and maintenance, LHN - Lack of information + High cost of new machines + No technical experts, LF - Lack of knowledge information and advanced technology + Few/no machinery suppliers in the area.

The Liluah metal casting cluster is highly dependent on a manual workforce were using of technology was minimal in the manufacturing process. However, as per the available resources, it was revealed that some latest technology is available in the market but financial constraints forced them to use a manual workforce. Apart from that, it is important to note that the cluster was facing various issues including technology.

Regarding the technological issues, the authors assumed that a good number of respondents realized the high cost of new machines while planning to purchase. Also, a significant number of respondents said lack of knowledge of information and advanced technology made them realize the issues related to technology. In addition, fewer respondents agreed that technology-related issues like low productivity due to obsolete technology, few or no machinery suppliers in the area, difficulty in the repair and maintenance of machines, and no technical experts had created more barriers in the manufacturing units.

Table No 8: Changes in technology/ machinery in the last 5 years

	Frequency	Percent
Yes	4	8
No	46	92

Source: Primary data collected by authors, 2021.

The given table shows that only 8 percent of the respondents said changes in machinery or technology were done in the last 5 years and the reasons were very specific.

(i) Daily new types of machines introduced in the market, (ii) Due to maintenance, the quality improvement machines are changing every year, (iii) Only cast structure changed for a new shape, (iv) Sometimes design changes were as per market demand (product design) and more than 90 percent of respondents accepted that there was no machinery or technological changes in the last 5 years.

Table No. 9: Were machines helping your production

	Frequency	Percent
Yes	50	100

Source: Primary data collected by authors, 2021.

The respondents from the metal casting cluster claimed that despite the importance of manual workforce could not be justifiable but the role of machines for manufacturing purposes is not deniable. Though laborers worked hard to maintain production quality where machines or equipment helped to initiate the manufacturing of the product. However, the given table indicated that without machines production process could not be complete. In addition, to the process of melting and casting, machines were used to increase the production capacity. Since the manufacturing units were labor-oriented and machinery use was very minimal. However, without machinery or technology, labor costs will be high and sometimes could hamper production cycles.

Table No. 10: Were machines helping to maintain production quality

	Frequency	Percent
Yes	49	98
No	1	2

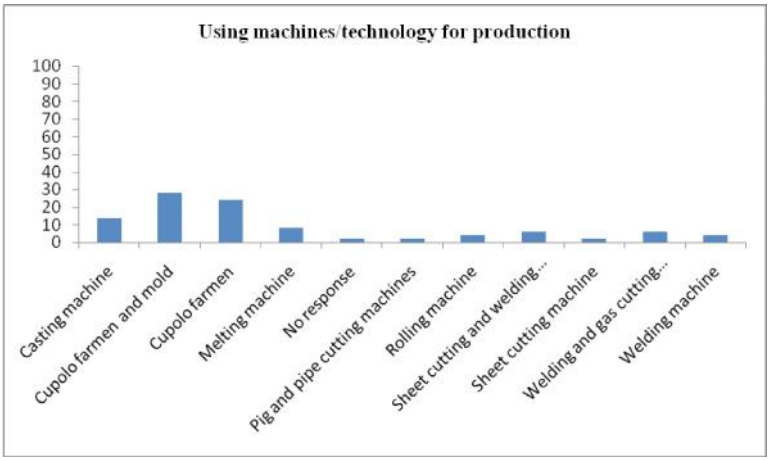
Source: Primary data collected by authors, 2021.

As far as the manufacturing process is concerned, we argued that machines or equipment helped in the production purposes not only in high production output but also maintains the production quality. Here, in the given table respondents also agreed that to maintain production quality the role of machines played a crucial role and positively impacted the production cycle. However, the majority of the respondents revealed that machines were always helping to maintain product quality. Also, it helps to increase the efficiency of the workforce, and stabilize the manufacturing process. Among them, very few said that though machines were helping to maintain product quality the work depended on laborers.

From the above diagram, it suggested that most of the firms had only one or more than one types of equipment for production purposes. Among all the respondents, a significant number were using both cupolo farmen and mold machines whereas, other good numbers were using cupolo farmen only. Apart from that other firms were using different kinds of machines for various purposes. The machines were a casting machine, melting machine, pig, and pipe cutting machine, sheet cutting and welding machine, welding and gas cutting machine, etc.

In the above tables, we tried to explain the machine's conditions and upgraded machines if required. The available data shows that

Figure 5: Machines or technology used for production



Source: Primary data collected by authors, 2021.

Table No. 12: Machine's status and requirements of new machines

The machines are			Do you think new machines are required		
	Frequency	Percent		Frequency	Percent
Latest	21	42	Yes	36	72
Old	29	58	No	14	28

Source: Primary data collected by authors, 2021.

around 42 percent of the respondents said using machines for production purposes was the latest and 58 percent said they were using old machines. Coming to our concern regarding if they realized the need for new or upgraded machines in the manufacturing firms.

It is important to note that more than 70 percent of respondents needed new or upgraded machines. In addition, the available data revealed that the majority of the respondents were not able to purchase new machines due to financial crisis despite knowing the importance of machines for huge productions. However, required machines were available in the local market but costlier and sellers did not provide credit facilities to the owners and less than 30 percent said new or upgraded machines were not required for the production process.

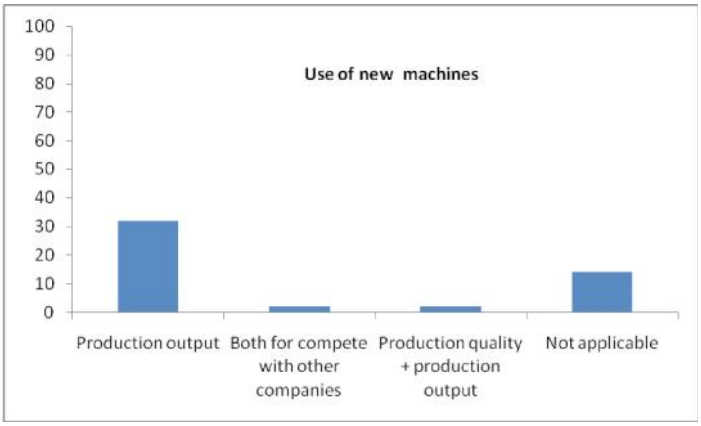
Among the 72 percent of respondents, more than 60 percent argued that they needed new or upgraded machines to increase the production output. Around 5 percent said they needed for improving product quality and production output to compete with foreign products and the remaining respondents needed only to improve product quality and production output. While near about 30 percent did not want new machines for production purposes.

Research center/Incubator

The empirical research shows that there was not a single research center or incubator for developing the cluster facilitated by the government or association and they have never approached any research center to improve the product quality.

The author was further sought particular causes regarding the research center or incubator, more than 80 percent of respondents agreed that these kinds of centers not useful or necessary to improve product quality. As per their information, it is important to note that the research center or incubator was not helpful in the cluster. The cluster was situated in a highly polluted area; therefore, a pollution control mechanism could be implemented rather than a research center.

Figure 6: Use of new machines



Source: Primary data collected by authors, 2021.

As far as the research center or incubator is concerned, less than 10 percent of respondents said that previously they came here only for their study purposes but it never helped to develop the cluster and never tried to solve the real issues.

Table No. 13: laborers are helping you to maintain production quality

	Frequency	Percent
Yes	48	96
No	2	4

Source: Primary data collected by authors, 2021.

As far as the use of technology and innovation in the cluster is concerned, the role of laborers also played a vital role to maintain production quality which directly and indirectly impacted the manufacturing units and cluster development as well. Keeping in view the importance of laborers to maintain production quality the given table shows that 96 percent of the respondents agreed laborers helped to maintain product quality while only 4 percent disagreed. For a further explanation, we approached firm owners and according to them, laborers were working at the firm premises average of 8 to 10 hours a day. However, laborers were doing hard work to maintain product quality. Also, laborers came every day to work and owners were getting benefitted as their dedication towards work was fully satisfied to maintain the product quality. Therefore, the cluster still survived the competition with foreign products.

As we proved that to maintain product quality and production output in the manufacturing units the importance of laborers was enormous. Therefore, we extended our further analysis of the role of labor and machines to improve the production quality and production output in the last 5 years and outcomes can be noted for further analysis.

Based on available data from the field the authors argued that only 28 percent of respondents believed laborers improved the product quality and production output to maximize profits. According to them, the kind of work done there was purely labor oriented and the manufacturing process was completely dependent on them. Also, they were very hardworking and the product quality and output were totally in the hand of the laborers.

The majority of the respondents agreed that machines and laborers were equally crucial for the firms to maintain the quality and output of the product to maximize profits. However, they believed that in the manufacturing process machines and laborers were interlinked with each other. Otherwise, the manufacturing process will be hampered. Therefore, a firm needed machines as well as laborers to maintain production to fulfill market demand. From the above discussion, the researcher observed that machines and laborers were equally crucial in the manufacturing process. It is important to note that initial steps of the manufacturing process machines were playing a crucial role and in the final stage, laborers were playing a crucial role to maintain production units. Also, it is very difficult to deny that the cluster was mostly run by the manual workforce and some firm units operated without any machines and in this case, they were dependent on other firms for machine work.

Summary and Conclusions

In India, unlike other states, West Bengal has an excellent location to avail potential natural resources and is well connected by rail, road, water, etc. From the mountains of the Northern region to the coastal area of the Southern part, the state has a good number of industries, including SMEs. Instead of tremendous opportunities, many MSMEs and clusters run informally, or legal frameworks are not followed. For instance, the Liluah metal casting cluster and Purba Medinipur human hair cluster were considered for the study. In this chapter, we have analyzed the size and nature of the clusters and the importance of employment generation.

Initial days Liluah metal casting cluster supplied parts to shipyard and rail factories. Later, the cluster started delivering various parts to different industries, such as; jute, cotton spinning, paper, sugar, oil mills, etc. From sand moulding preparation to final inspection and dispatch of the products, the cluster offered income opportunities to a specific society for more than a hundred years. Nevertheless, in the last two decades, due to pollution, an unhealthy working environment, low wages, and

a tremendous workload, the cluster has experienced a shortage of workers. Also, the dependency of the workforce was shifting slowly toward machinery and technology. In contrast, more people showed interest and started manu-facturing units in the recent decade as no better income opportunities are available in the nearby locality.

The century-old Liluah metal casting cluster has provided enormous opportunities to the local people and the local and regional economies. Previously the cluster held the most giant metal casting cluster in Asia, but nowadays, the cluster is facing various challenges related to manufacturing units. The present study has analyzed the importance of the metal casting cluster to the local economy. It argued that the cluster created enormous possibilities for its stakeholders and upcoming generations. To bring more opportunities, the cluster and its people need to solve some critical issues. Also, the cluster is located in a highly polluted area, which creates serious health issues for various stakeholders and, therefore, needs government or research institute intervention.

Laborers and machines have been a part of every process for several years. The study also found that number of firms and annual turnover had increased more than in previous decades except for the number of workers. Despite their essential role in the production process, workers dramatically decreased due to a lack of employment opportunities and an unhealthy working environment.

Various sources also supplied raw materials from the local market to the cluster. Also, traders and buyers collected raw materials from domestic and international markets and supplied them to the firm units. Similarly, various sources, including traders and agents, collected the production output and supplied it to the national and international markets. Perhaps, manufacturing units linked with other firms within and outside the cluster for production purposes, and the transportation sector and agriculture sector had a critical role as far as backward and forward linkages were concerned.

Using technology in manufacturing units enhances production scale and creates a vast scope of business growth. For instance, the Liluah metal casting cluster suffered from a low production scale and product quality due to a lack of technology, which impacted the overall production process. As a result, competition with foreign products increased significantly in the last couple of years. It is important to note that the cluster has not experienced any significant changes in technology and machinery in the last five years despite the potential contribution to the production system. To enhance the innovation practices in the cluster, it is pertinent to focus on sharing knowledge and robust firm linkages mechanism. The research and development can substantially support building a favorable working environment for the workers and product quality.

Limitations of the Study

The study has several limitations. For instance, the study has analyzed the impact of the cluster on the local economic development based on the firm owners' perspective and attempted to explain various challenges and prospects. Future, there is a need to integrate various stakeholders like laborers, government institutions, and mediators with other allied manufacturing sectors. The sample was selected only for the Howrah district's Liluah metal casting cluster owners.

Future Areas of Research

The results and outcomes cannot be generalized to all the manufacturing clusters in the region. However, the study recommends an enhanced sample size and including other MSMEs clusters and their stakeholders to understand the importance of manufacturing clusters and their contribution to the regional economies.

References

Baptista, R., & Swann, P. (1998). Do firms in clusters innovate more? *Research Policy*, *27*(5), 525-540. https://doi.org/10.1016/S0048-7333(98)00065-1

Best, M. H. (2011). The New Competition: Institutions of Industrial Restructuring. In *Wiley*.

Boschma, R., & Frenken, K. (2011). The emerging empirics of evolutionary economic geography. *Journal of Economic Geography*, *11*(2), 295-307.

Brenner, T., & Gildner, A. (2006). Long-term Implications of Local Industrial Clusters. *European Planning Studies*, *14*. https://doi.org/10.1080/09654310600933371

Brown, J. S., & Duguid, P. (1991). Organizational Learning and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation. *Organization Science*, *2*(1), 40-57.

Cainelli, G., & Zoboli, R. (2004). The Evolution of Industrial Districts: Changing Governance, Innovation and Internationalisation of Local Capitalism in Italy. In

Contributions to Economics. https://doi.org/10.1007/978-3-7908-2700-2

Christensen, C. M. (1997). *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, MA: Harvard Business School Press.

Cooke, P. (1997). Regions in a global market: the experiences of Wales and Baden-Wurttemberg. *Review of International Political Economy*, *4*(2), 349-381. https://doi.org/10.1080/096922997347814

Dalum, B., Pedersen, C. Ø. R., & Villumsen, G. (2005). Technological Life-Cycles: Lessons from a Cluster Facing Disruption. *European Urban and Regional Studies*, *12*(3). https://doi.org/10.1177/0969776405056594

Easterby-Smith, M., Snell, R., & Gherardi, S. (1998). Organizational Learning: Diverging Communities of Practice? *Management Learning*, *29*(3), 259-272. https://doi.org/10.1177/1350507698293001

Gittelman, M., & Kogut, B. (2003). Does Good Science Lead to Valuable Knowledge? Biotechnology Firms and the Evolutionary Logic of Citation Patterns. *Management Science*, *49*(4), 366-382. https://doi.org/10.1287/mnsc.49.4.366.14420

Grabher, G. (1993). The Weakness of Strong Ties; the Lock-In of Regional Development in the Ruhr Area. In *The Embedded Firm: On the Socioeconomics of Industrial Networks* (pp. 255-277). Routledge.

Guerrieri, P., & Pietrobelli, C. (2004). Industrial districts' evolution and technological regimes: Italy and Taiwan. *Technovation*, *24*(11), 899-914. https://doi.org/10.1016/S0166-4972(03)00048-8

Iammarino, S., & McCann, P. (2006). The structure and evolution of industrial clusters: Transactions, technology and knowledge spillovers. *Research Policy*, *35*(7), 1018-1036. https://doi.org/10.1016/j.respol.2006.05.004

Jones, A. (1998). Local economies and business networks re visited. A case study of business and professional services in London. *Local Economy*, *13*(2), 151-165.

Kasabov, E. (2010). Why Every Cluster Cannot be a Successful Community? *European Planning Studies*, *18*(9), 1445-1468. https://doi.org/10.1080/09654313.2010.492586

Lagendijk, A., & Lorentzen, A. (2007). Proximity, Knowledge and Innovation in Peripheral Regions. On the Intersection between Geographical and Organizational Proximity. *European Planning Studies*, *15*(4), 457-466. https://doi.org/10.1080/09654310601133260

Langlois, R. N., & Steinmueller, W. E. (1999). The evolution of competitive advantage in the worldwide semiconductor industry 1947-1996. In *Sources of industrial leadership/ : studies of seven industries* (Issue Ferguson 1993, pp. 19-78). Cambridge University Press. https://doi.org/10.1017/CBO9781139175128

Lave, J., & Wenger, E. (1991). *Situated Learning Legitimate Peripheral Participation*. https://doi.org/10.1017/CBO9780511815355

Lovering, J. (2001). The Coming Regional Crisis (And How to Avoid It). *Regional Studies*, *35*(4), 349-354. https://doi.org/10.1080/00343400124009

Lovering, J. (2007). The Relationship Between Urban Regeneration and Neoliberalism: Two Presumptuous Theories and a Research Agenda. *International Planning Studies*, *12*(4), 343-366. https://doi.org/10.1080/13563470701745504

Macleod, G., & Jones, M. (2007). Territorial, Scalar, Networked, Connected: In What Sense a 'Regional World'? *Regional Studies*, *41*(9), 1177-1191. https://doi.org/10.1080/00343400701646182

Martin, R., & Sunley, P. (2011). Conceptualizing Cluster Evolution: Beyond the Life Cycle Model? *Regional Studies*, *45*(10), 1299-1318. https://doi.org/10.1080/00343404.2011.622263

Menzel, M.-P., & Fornahl, D. (2010). Cluster Life Cycles – Dimensions and Rationales of Cluster Evolution. *Industrial and Corporate Change*, *19*(1), 205-238. https://doi.org/10.1093/icc/dtp036

Miles, R. E., & Scaringella, L. (2012). Designing Firms to Fit the Future. *Journal of Organization Design*, *1*(2). https://doi.org/10.7146/jod.1.2.6343

Ministry of MSME, G. of I. (2017). *District Industrial Profile*. http://www.msmedikolkata.gov.in/uploads/2021/03/districtprofiles/2017-18/HOWRAH.pdf

Montiel, I., & Delgado-Ceballos, J. (2014). Defining and Measuring Corporate Sustainability: Are We There Yet? *Organization & Environment*, *27*(2), 113-139. https://doi.org/10.1177/1086026614526413

Østergaard, C. R. (2008). Knowledge flows through social networks in a cluster: Comparing university and industry links. *Structural Change and Economic Dynamics*, *20*(3), 196-210. https://doi.org/10.1016/j.strueco.2008.10.003

Porter, M. E. (1998). Clusters and the new economics of competition. *Harvard Business Review*, *76*(6), 77-90.

Randelli, F., & Boschma, R. (2012). Dynamics of Industrial Districts and Business Groups: The Case of the Marche Region. *European Planning Studies*, *20*(12), 1961-1974. https://doi.org/10.1080/09654313.2012.665040

Shaw, A. T., & Gilly, J.-P. (2000). On the Analytical Dimension of Proximity Dynamics. *Regional Studies*, *34*(2), 169-180. https://doi.org/10.1080/00343400050006087

Steven Klepper. (2010). The origin and growth of industry clusters: The making of Silicon Valley and Detroit. *Journal of Urban Economics*, *67*(1), 15-32. https://doi.org/10.1016/j.jue.2009.09.004

Swan, J., Scarbrough, H., & Robertson, M. (2002). The Construction of 'Communities of Practice' in the Management of Innovation. *Management Learning*, *33*(4), 477-496. https://doi.org/10.1177/1350507602334005

The Energy and Resources Institute, T. (2016). *Annual Report, 2016/17*. aahttps://www.teriin.org/sites/default/files/files/TAR_2016-17.pdf

Torre, A., & Rallet, A. (2005). Proximity and Localization. *Regional Studies*, *39*(1), 47-59. https://doi.org/10.1080/0034340052000320842

Walker, R., & Storper, M. (1989). *The Capitalist Imperative: Territory, Technology and Industrial Growth* (XI). New York: Basil Blackwell.