CLUSTER DEVELOPMENT APPROACH IN INDIA: AN ANTIDOTE FOR MICRO, SMALL, AND MEDIUM ENTERPRISES

Dinesh Rawat,

Ph. D Student,
University School of Management Studies, Guru Gobind Singh
IndraprasthaUniversity, New Delhi, India

R.K. Mittal,

Professor,
University School of Management
Studies, Guru Gobind Singh
IndraprasthaUniversity, New Delhi, India

Vijita Singh Aggarwal,

Professor,
University School of Management
Studies, Guru Gobind Singh
IndraprasthaUniversity, New Delhi, India.

ABSTRACT

This paper focuses on two main aspects of the clusters, namely, which factors gives rise to development of clusters and what benefits are acquired by firms from participating in clusters of India. The methodology used for this article is a literature review of published materials. A broad search strategy was used using key terms like industrial clusters, evolution of clusters, and advantages of clusters from electronic databases. Among the factors that give rise to clusters in India, the more important ones are historical background, easy availability of raw materials, existence of one or few large enterprises, pooled labour market of skilled workers, regional government policy, and presence of entrepreneurial spirit. The important benefits reported by enterprises through their presence in clusters are formation of new business, network formation with supporting institutions, women empowerment, market development, product development, easy availability of finance, increased trust and collaboration among members, increase in sales, skills up gradation of workers and employment opportunities. We expect that the findings from this study will assist firms and policy makers in making more informed decisions regarding the adoption of a cluster approach and start new initiatives for promoting inter-firm relations within MSME clusters. The major contribution of this paper is that it attempts to justify the positive impact of cluster approach and describe the status of clusters in India.

Keywords: Clusters, Industrial clusters, Small and medium enterprises (SMEs), MSMEs, SME clusters.

Introduction:

Worldwide, the micro, small and medium enterprises (MSMEs) have played a leading role in promoting equitable regional development and economic growth. Globally, MSMEs are the largest employment generators. MSMEs employ at least 45 percent of the workforce in half of the high income economies (FICCI, 2013). Similar results have been observed in India, where MSMEs have contributed beyond doubt to the Indian economy by generating employment opportunities, promoting exports and innovations, and by developing entrepreneurial skills. This sector has emerged as a highly vibrant and dynamic sector of the Indian economy and enabled our country to achieve

industrial growth and development (Vasu, MAY, 2014). MSMEs helped in industrialisation of rural and backward areas. They also played a crucial role in providing large employment opportunities, reducing regional imbalances, assuring more equitable distribution of national income and wealth. Since MSMEs contribute enormously to the socio-economic development of the country thus they can be boon and a hope for Indian economy in near future (Ali, 2014). In the present business scenario, the MSMEs have been accepted as the engine of industrial growth as they provide employment to around 805 lakh people and contribute 37.33 percent towards total manufacturing output of the country (MSME, 2016). With a contribution of 35 percent to direct exports, the MSME sector has achieved substantial landmarks for the industrial development of India (FICCI, 2013).

An important feature of India's industrial organization is that Indian MSMEs often form clusters. Clustering has been the age old phenomenon in India. Clusters have been in existence in India for centuries and are known for their products at the national and international level (Singh, 2010). Clusters are geographic concentration of interconnected companies and institutions in a particular field which includes actors such as suppliers, customers, manufacturers, government and other institutions such as standards-setting agencies, universities, think tanks, and trade associations (Porter, 1998). Clusters occur at several geographical levels (nations, states, cities) and in many types of industries either large or small which decreases the appropriateness in the definition of cluster (Porter, 2000). With respect to micro, small and medium enterprises, cluster is a sectoral and geographical concentration of micro, small and medium enterprises producing a similar range of goods or services and facing similar threats and opportunities (UNIDO, 2006); Das et al., 2007). Industrial clusters consist of firms in a region dedicated to particular product and offer favourable environment which allows the firms to easily pool the resources for them to become more competitive (Niu et al., 2008). In India it is estimated that there are around 6400 clusters. A total number of 5847 clusters have been mapped. Out of theses, 2443 are SME clusters, 540 are handloom clusters and 2864 are handicraft clusters.

Few important questions common to these clusters arise: What are the critical drivers for their growth in India? What benefits MSMEs gets by participating in these clusters? The purpose of this paper is to address these two questions. This paper answer these questions by examining a sample of 20 clusters on the basis of information provided in the previous surveys on India's industrial clusters.

This paper has been divided into 7 sections. Section 2 reviews the important studies relevant to the present research. Section 3 defines the objectives of the study. Section 4 deals with research methodology part and provides a brief description of the selected clusters. Sections 5, 6, and 7 respectively deal with findings, conclusion, and scope for further research.

Literature Review:

For better understanding and to draw useful inferences, the important studies reviewed have been presented under the following heads:

Clustering Perspective:

The underlying concept of cluster which most economists have referred to as agglomeration dates back to 1890 in the work of Alfred Marshal. Alfred Marshall is among the first who examined the phenomenon of clustering in industrial organizations. Alfred Marshall in 1920 explained why particular specialized industries concentrate in particular localities through Industrial districts which he defined as concentration of specialized industries of similar kind in a particular locality. (Marshall, 1920) suggested that clustering of firms operating in similar industries creates externalities in the form of economies of labor and supply of specialized input materials. (Pouder & St. John, 1996) describe geographic clustering of firms in the same industry through hot spot which they defined it as regional clusters of firms that compete in the same industry, begin as one or several start-up firms that, as a group, grow more rapidly than other industry participants in sales and employment levels, and have the same or very similar immobile physical resource requirements in the long run. However, Michael Porter was the one who gave the cluster concept relevance. Michael Porter, a leading authority on company strategy and the competitiveness of nations and regions introduced the term industry cluster in his book The Competitive Advantage of Nations in 1990. Porter defined clusters as geographic concentration of interconnected companies and institutions in a particular field which includes actors such as suppliers of specialized inputs for components, machinery and services, providers of specialized infrastructure, customers, manufacturers of complementary products, companies in industries requiring skills, technologies, or common inputs, government and other institutions such as universities, standards-setting agencies, think tanks, vocational training providers, and trade associations which provide specialized training, education, information, research, and technical support (Porter, 1998). Later various other scholars and organizations worked in this area (Baptista & Swann, 1998); (Morosini, 2004); UNIDO, 2006; Das et al., 2007; (Planning Commission, 2012); (Giuliani, 2013); (Fundeanu & Badele, 2014). (Baptista & Swann, 1998) defined geographic cluster as a strong collection of related companies located in a small geographical area, sometimes centered on a strong part of a country's

science base. Morosini (2004) defined industrial cluster as a socioeconomic entity characterized by a social community of people and a population of economic agents localized in close proximity in a specific geographic region. Clusters are defined as sectoral and geographical concentration of enterprises, especially small and medium, which share a future, both in terms of opportunities and threats (UNIDO, 2006; Das et al., 2007). A Cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, that share common markets, technologies, worker skill needs, and which are often linked by buyer-seller relationships (Planning Commission, 2012). Industry clusters are geographic agglomerations of firms specialized in one or more related industries (Giuliani, 2013). According to (Fundeanu & Badele, 2014) competitive and innovative industry which favours the emergence of new form of competitive advantages in the form of partnerships between businesses, research institutions, universities and states is called cluster.

Cluster development thought in India:

It was observed that MSME sector was hard hit by the Government's recourse to liberalisation policy in 1991. The MSME sector was vulnerable because it had neither the size nor the technology advantage. Small scale industries observed deterioration in their performance after 1991. Table 1 shows the deterioration in the performance of small scale industries after 1991.

No. of Units: The number of units in the SSI Sector over the year is the criteria to decide the growth of SSI in the economy. Though the numbers of units were increasing in absolute figures, the compound annual growth rate has decreased (Table 1) from 10 % in 1977-1992 .i.e. pre-reform periods to 8.97 % after 1991 .i.e. post-reform periods from 1992-2002. This was supported by further annual decrease from 2002-2006 (Table 1).

Employment growth: Employment generation has always been one of the main objectives of the policies aimed at economic development and growth of the nation. The compound annual growth rate has decreased (Table 1) from 5.45 per cent in pre-reform period to 5.33 per cent in post reforms period, which is quite disheartening.

Gross Output: The compound annual growth rate has decreased from 91.06 per cent in pre-reform period to 16.81 per cent in post reforms period (Table 1). This further went down from 2002-06 (Table 1).

Export performance: During the pre-reforms period, the average growth in SSI exports was 24.26 percent which was reduced to 18.98 percent in post-reform period (Table 2).

All these results show that the small scale sector does not get the required support from the Governments. Thus it was necessary to help small scale industries to

improve their performance. Several promotional measures were taken by the Government. Keeping in view the enormous potential of this sector, the Department of small scale industries and Agro & Rural industries (DSSI & ARI), Ministry of industry set up Abid Hussain Committee in 1995. The Committee report, which was released in 1997, advocated cluster development as the approach to be followed to promote SSI. It said that cluster based approach is a very practical approach to SME promotion in India since there already exist a large range of small scale industry clusters across the country. In 1996, UNIDO was requested by the DSSI, Ministry of Industry, to conduct a mapping of SSI clusters, promote pilot projects in selected clusters and assist the Ministry to formulate a national cluster development programme. Various project, organizations and schemes were launched like UPTECH (scheme for technology up-gradation and management) in 1998 which was renamed as Small Industry Cluster Development Programme (SICDP) in 2003, Baba Saheb Ambedkar Hastashilp Vikas Yojana (BAHVY) for integrated development of potential handicrafts clusters in 2001-02, and Foundation for MSME Clusters (FMC) in 2005 for promoting MSMEs in clusters. In the Budget speech of 2006-07 the then Finance Minister said that the Cluster Development model can be usefully adopted not only to promote manufacturing but also to renew industrial towns and build new industrial townships. In 2007, the erstwhile cluster development scheme 'Small Industries Cluster Development Programme (SICDP) was renamed as Micro and Small Enterprises Cluster Development Programme (MSE-CDP) with more broad objectives like support the sustainability and growth of MSEs by addressing common issues such as improvement of technology, skills and quality, market access, access to capital, etc.

Types of Clusters:

Clusters are present worldwide. Every country has a number of agencies which have come up with a range of definitions, tailored to suit the typology of clusters, which an agency is mandated to cater to. For instance in India, clusters are broadly divided into SME clusters, handicraft clusters and handloom clusters, similarly in U.S and Canada they are divided into traded clusters and local clusters, and in Japan they are divided as per industry like automobile and transport equipment, aircraft, food manufacturing etc. (Markusen, 1996) gave three new types of industrial districts (Table 3): first, hub-and-spoke districts, revolving around one or more dominant, externally oriented firms; a satellite platform, an assemblage of unconnected branch plants embedded in external organization links; and the state-anchored district, focused on one or more public-sector. (John & Pouder, 2006)proposed two types of clusters:

technology-based clusters and industry-focused clusters, on the basis of differences in economic activity. As per them industry-focused clusters develop deep expertise in the industry of interest and include resources skilled labor, banks, accountants and other service providers with in-depth knowledge of industry. In contrast, technology-based clusters always focus on new technologies and include resources such as entrepreneurial experience and insight. (Gulati & Sarkar, 2006) defined different types of clusters (Table 4) based on various types of categorisations.

Defining clusters in India:

In India a number of agencies have come up with a range of definitions, tailored to suit the typology of clusters, which an agency is mandated to cater to, by specifying a certain minimum number of units in a given measured location. Few major agencies and their cluster definition are: Micro and Small Enterprises - Cluster Development Programme (MSECDP) defined cluster as a group of enterprises located within an identifiable and as far as practicable, contiguous area and producing same/similar products/services; Office of the Development Commissioner (Handlooms) - Integrated Handloom Cluster Development Programme (IHCDP), Ministry of Textiles – define handloom cluster as one having a minimum of 500 looms; and Office of the Development Commissioner (Handicrafts) - , Ministry of Textiles - Baba Saheb Ambedkar Hastshilp Vikash Yojana (AHVY) - defined handicraft clusters as agglomerations having 100 artisans. In case of North East Region, Jammu & Kashmir and other hilly terrains, the clusters will have a minimum of 50 artisans.

In India, a cluster is known by the name of the product being produced by principal firms and the place they are located in. Cotton hosiery (the product) cluster of Tirupur (the place), Knitwear cluster of Ludhiana, Brass products cluster of Moradabad and Information Technology cluster of Bangalore are a few such examples. Most of these clusters have been in existence for years and are well known not only locally, but also nationally and at times internationally. At present it is estimated that there are around 6400 clusters in India. A total number of 5847 clusters have been mapped. These clusters are spread all over India.

Cluster formation:

In past few decades researchers have shown an increased interest in the study of clusters and other related areas like factors that support clusters development. Some of the factors that help in development of clusters are: presence of related and supporting industries, acts of innovation, factor conditions, sophisticated, or stringent local demand, prior existence of supplier industries, related industries, and presence of one or two innovative

companies that stimulate the growth of many others (Porter, 1998). As per (Boari, 2001) key drivers of cluster origin and formation in Northern Italy were role of high demanding customers and presence of local expertise like local technical school and lastly the presence of leading firms which were nurturing future entrepreneurs. (Boari, 2001) also concluded that the role of public policy in creating clusters of firms was negligible .i.e. no industrial clusters emerge from industrial policy initiatives. Clusters evolve because of knowledge creation within the cluster (Maskell, 2001) and strong skills base, networks and relationship, innovation and strong R&D base, presence of an entrepreneurial spirit and good physical infrastructure and access to finance (Consulting, 2001). According to (Yamawaki, 2002) factors gave rise to industrial clusters in Japan are existence of leading large firms, presence of research institutes, prior existence of supporting and related industries, and availability of human resource. There is at least one large indigenous Indian firm functioning as an anchor company and also acts as attractors for other major companies (Khomiakova, 2007). As per (Das, 2008) the key determinants of cluster performance in context of developing countries are: strength of networks, degree of nature of informalisation, and dynamics and effects of macro policy environment. Das also suggested few approaches for cluster promotion like skill formation/ training, local economic development, technology/ innovation support, and expanding trade / exports. Cooperation and integration among firms (Oprime et al., 2011), and universities and research institutes in a cluster also play an important role in development of a cluster (Fundeanu & Badele, 2014). Three key factors for success of clusters studied in India (U.P leather and footwear cluster, Varanasi silk saree cluster and Moradabad brass ware cluster) were decentralized production integrated through a complex web of relations, trust and co-operation and skills of the artisans (Varman & Chakrabarti, 2011). Professional human resource is an important factor for industrial cluster formation (Hsu et al., 2014).

Benefits of Clusters:

Once clusters are formed they provide various benefits to the firms present in there.

As per (Barkley & Henry, 1997) industry clusters encompass firm groupings with different characteristics which provide significant advantages to a regional economy through employment growth and local economic development. According to Porter (1998) cluster helps in increasing the productivity of firms present in it, enhance the innovative performance of firms, and stimulate the formation of new businesses. Clusters helps in reducing the costs faced by local firms (Maskell, 2001). (Boari, 2001) explained that clusters play an important role in performance of small firms present in packaging industry of northern Italy.

According to Yamawaki (2002) important benefits acquired by small firms in industrial clusters of Japan are ease of procurement, diffusion of technology, access to suppliers and market information, policy support, and division of labour or specialization. (Bell, 2005) investigated the relationship among clusters, networks, and firm innovativeness in an industrial cluster of Toronto. They concluded that presence in cluster enhances the firm innovativeness without the influence of network structure. (Narayana, 2007) concluded that in India economic performance of small scale enterprises has been higher than non-clustered small scale enterprises. Cluster promotes and facilitates productivity, innovation, reduction in transportation cost (Karaev et al., 2007) and reduces transportation cost (Khomiakova, 2007). As per (Porter, 2007) firms in clusters transact more efficiently, can start new business more easily, share knowledge more readily, and implement innovation more rapidly. Cluster provide competitive structure to the firms present which contribute to lower costs and higher innovative performance (Schiele, 2008) and also provide an environment which is conducive to innovation and knowledge creation (Solvell, 2008). (Beaudry & Swann, 2009) examined how firm growth in the UK is affected by being present in strong industrial clusters. They used level of employment as a variable for measuring firm growth and cluster strength. According to them there was a positive association between firm growth and cluster strength .i.e. own-sector employment majorly in manufacturing sector. Firms innovate more frequently and improve their market positions due to constant competitive pressure from rival firms in cluster (He & Rayman-Bacchus, 2010). Clusters provide pooled market for workers with industry specific skills, provide higher wages to employees, and drive local employment (Wennberg & Lindqvist, 2010). Clusters allow firms to have access to suppliers, qualified human resources, implicit knowledge of production process which increase firm's competitiveness (Oprime et al., 2011). Clusters makes marketing and sales easier, contributed positively towards regional economic development, rural income generation and poverty alleviation (Das & Das, 2011). Felzensztein et al. (2012) conducted their study on perceived role of clusters among clustered and non-clustered firms in Latin America. They concluded that firms present in clusters tend to perceive more benefits and opportunities in terms of marketing knowledge availability, innovation and new product development. Industrial cluster effectively disseminate knowledge and information among firms and due to which firms are more able to increase competitiveness which is not available to an individual firm (Niu et al., 2012). Clusters also stimulate new business formation (Planning Commission, 2012). In India MSMEs have increasingly benefited from the advent of industrial clusters (IBEF, 2013). There is positive relationship

between firm performance and the factors such as proximity to companies, social capital, business environment, trust building and knowledge resources for rice mills located in a cluster. Proximity of companies and business environment are strongly related with the performance (Singh & Shrivastava, 2013). Clusters have positive impact firm's performance and enhance their competitive advantage (Hsu et al., 2014). Clusters are key factors for creating new jobs, boosting entrepreneurship, economic growth and innovation by fostering relationships between enterprises, universities, research institutes and local government (Fundeanu & Badele, 2014). Lai et al., (2014) explored the effects of industry clusters on knowledge management and innovative performance. They concluded that industry clusters significantly influences knowledge management and this knowledge management act as a meditor between positive effect of industry cluster on innovative performance. (Rocha, 2015) conducted review of empirical studies on clusters impact on firm performance in clusters of Latin America and concluded that clusters have positively contributed to firm growth.

Objectives:

The present study has two objectives:
- To identify the critical determinants of industrial clusters development in India
- To identify the benefits accrued by MSMEs present in industrial clusters in India

Research Methodology:

The methodology used for this paper is a literature review of published materials. A broad search strategy was used using key terms like industrial clusters, evolution of clusters, and advantages of clusters from electronic databases. Further, a sample of 20 clusters in India was selected from the clusters previously studied by the Foundation for MSME clusters (FMC, 2006); Das et al., 2007, (Russo, Clara, & Gulati, 2000), and (Planning Commission, 2012). Detailed analysis of these 20 clusters was done. These clusters are not located in one particular area rather they are dispersed widely across India. Each of these clusters is briefly described in below table 5.

Result and Discussion:

Key factors responsible for cluster development:

What are the key driving factors that underlie these 20 clusters? Many important drivers have emerged from the analysis of above mentioned clusters. Following are the key drivers.

i.   Historical background:

The Chanderi Handloom cluster , Solapur terry towel cluster, Brass and bell metal cluster of Rengali,

Floriculture cluster of Pune, Crochet lace cluster of Narsapur, Mojari clusters of Rajasthan, Kannaur handloom cluster, Hand block printed textile cluster of Jaipur, Wet grinder cluster of Coimbatore, Bidri cluster of Bidar and Stone carving cluster of Konark had already been known for their products. Traditionally the artisans and families have been making products for generation in these clusters. Through their long histories the artisans have accumulated the skills required for making products.

ii.   Existence of one or few large enterprises:

The second factor is the existence of one or few large enterprises. The existence of a large enterprise in clusters like Machine tools cluster of Bangalore, Chittoor Fruit Processing cluster, Heavy Engineering fabrication cluster of Trichy, Rubber cluster of Kottayam, and Hosiery cluster of Tirupur, has stipulated the entry and growth of other firms and the cluster itself.

iii.   Pooled labour market of skilled workers:

Some of these clusters were formed and got success because of access to pooled labour market of skilled workers in their region. The Chanderi Handloom cluster, Solapur terry towel cluster, Crochet lace cluster of Narsapur, Mojari clusters of Rajasthan, Kannaur handloom cluster, and Hand block printed textile cluster of Jaipur , took the advantage of the presence of such pool of skilled manpower.

iv.   Regional Government Policy:

The regional governments often played significant roles in providing seed for formation and development of these clusters. Heavy Engineering fabrication cluster of Trichy, Solapur terry towel cluster, Floriculture cluster of Pune, are the few clusters where regional governments took important initiatives for their growth. Supportive law and order situation, supportive regulatory framework, and absence of unnecessary interference by government officials and inspectors were some of initiatives provided by the state governments.

v.   Presence of entrepreneurial spirit:

Diesel engine and engineering cluster of Rajkot and Brass parts cluster of Jamnagar have emerged only after when a few pioneering entrepreneurs started manufacturing the products.

vi.   Easy availability of raw materials:

The Coir cluster of Alleppey, Hosiery cluster of Ludhiana and Rubber cluster of Kottayam are the clusters which illustrates the importance of the easy availability of raw materials.

Benefits accrued by firms in clusters:

As per the analysis of above mentioned clusters it was found that the firms have reaped multiple benefits by being actively associated in the cluster. The advantages experienced under cluster approach are mentioned below.

i.   Formation of new business:

In Coir cluster of Alleppey more than 4500 tiny and small enterprises were evolved. There has been an increase in the number of ISO registered enterprise in Chittoor Fruit Processing cluster, Floriculture cluster of Pune, and Diesel engine and engineering cluster of Rajkot.

ii.   Network formation with supporting institutions:

Greater synergies were established between cluster MSMEs and support institutions. Gap between enterprises, institutions were reduced over the period in Heavy Engineering fabrication cluster of Trichy, Solapur terry towel cluster, Diesel engine and engineering cluster of Rajkot, Floriculture cluster of Pune. Strong institutional linkages were formed in these clusters. Supporting institutions has helped enterprises in pursuing common activities in terms of input purchases, establishing common testing laboratory and carrying out common marketing initiatives. Enterprises in these clusters started collaborations and tie ups with domestic firms and research institutes including Universities.

iii.   Women Empowerment:

Many women consortia were financed in Coir cluster of Alleppey. Women majorly housewives were organized into self help groups in Brass and bell metal cluster of Rengali. Various training programme for rural woman artisans were launched in Mojari clusters of Rajasthan.

iv.   Market Development:

Various new international markets were explored in Machine tools cluster of Bangalore. Consortium of various enterprises was formed and also a website was developed for marketing the products in Crochet lace cluster of Narsapur. Enterprises in Mojari clusters of Rajasthan got opportunity to sell their markets in new marketing avenues like Dilli Haat, India Habitat Centre. Various international firms visited these clusters for marketing tie-ups and it became easy for the enterprises to access market information through specialised agencies.

v.   Product Development:

New techniques to raise competitiveness were introduced in Machine tools cluster of Bangalore, Chittoor Fruit Processing cluster, Heavy Engineering fabrication cluster of Trichy, Brass and bell metal cluster of Rengali, and Diesel engine and engineering cluster of Rajkot. Enterprises introduced new design

inputs with the help of local and international designers in cluster like Mojari clusters of Rajasthan, and Hosiery cluster of Ludhiana.

vi. Easy availability of finance:

Enterprises in Chanderi Handloom cluster reported easy access to capital assistance from the institutions. Grant-in-aid was sanctioned by the financing institutions to MSMEs for setting up CFC, and business promotion. State government provided support packages for infrastructure development in clusters like Wet grinder cluster of Coimbatore, and Chanderi Handloom cluster.

vii. Increase in sales, skills up gradation of workers and employment opportunities:

All clusters reported additional business sales, better employment opportunities and skills upgradation of workers. Many enterprises made huge savings through implementation of better shop floor practices and efficient energy audits.

viii. Increased trust and collaboration among members:

To enhance the backward and forward linkages, exchange for sub-contracting was established in cluster like Rubber cluster of Kottayam. Cluster like Chittoor Fruit Processing cluster, Solapur terry towel cluster, and Diesel engine and engineering cluster of Rajkot observed increase in trust and collaboration among the enterprises and other supporting institutions. Enterprises in these clusters started pursuing common business plans. Enterprises in these clusters started inter-firm collaborations for sub-contracting and other business activities.

Conclusion:

The present research had two objectives viz. first, to identify critical determinants of cluster development in India and to identify the benefits accrued by firms present in clusters. This study has been carried out in the context of 20 clusters dispersed widely across India. This study incorporates a literature review method to filter key factors that are responsible for cluster development and major benefits accrued by firms due to their presence in clusters to conclude a conceptual framework. Further detailed analysis of the 20 clusters of India has been done to conclude that firms in a cluster reap emormous benefits. On cluster development factors front, the analysis showed the following factors responsible for development of clusters; Historical background, existence of one or few large enterprises, pooled labour market of skilled workers, regional government policy, presence of entrepreneurial spirit, easy availability of raw materials. These six factors are not meant to substitute each other instead several of them are often present

together and complement each other when a cluster emerges in a region. These factors by no means are exhaustive but they are consider critical for these twenty clusters in India in this paper. Understanding of these driving factors will assist the managers of these enterprises in making more informed decisions and frame new policies for the healthy growth of their firm. On the benefits front, the enterprises have benefited in multiple ways by actively associated in the cluster. They reported the following benefits; formation of new business, network formation with supporting institutions, women empowerment, market development, product development, easy availability of finance, increased trust and collaboration among members, and increase in sales, skills up gradation of workers and employment opportunities. The results suggest that firms have benefitted from the advent of industrial clusters. Due to the benefit of networking, firms have been able to overcome barriers such as global Competition, technological obsolescence, investment shortages, and supply chain incompetence. The inter-firm trust and collaboration stimulated by these networks have aided the firms to move up the value chain and gain competitiveness. Presence in clusters has helped firms in introducing innovation in products and processes. The list of these key cluster development determinants and major benefits of industrial clusters are quite similar and consistent with the factors and benefits given in previous literature.

Scope for further research:

Despite of the benefits of clustering to the firms present in clusters, few issues have been observed. First, related to display of varying degrees of success within the cluster by the enterprises. Firms in clusters do not have equal chances of sustaining economic growth (Perry & Tambunan, 2009). Mere location in the cluster does not guarantee higher level of performance than their rivals (Lei & Huang, 2014). Second, related to networks among cluster stakeholders. Zhao et al., (2010) suggest that the main concern is that how firms in cluster interact and how the networks formed by this inter-firm relationship influence overall business performance. There is a need to highlight the difference between the kind of relationship among firm in cluster (Lamprinopoulou & Tregear, 2011). Industrial clusters differ with regard to networks .i.e. structure of networks is different in different clusters (Martinez et al., 2012). Third, related to uneven distribution of knowledge. Knowledge is unevenly distributed in clusters and its flow is restricted to some firms only which make them different in terms of innovation and economic performance (Morrison & Rabellotti, 2009). Firms in cluster do not have knowledge or cannot access all the knowledge transfer resources just by their physical presence (Hoffmann et al., 2014). Such issues raised the interesting question about the strategy which the

firms must adopt to reduce the difference in their performance and increase the flow of knowledge among them in the cluster. Thus the next step would be answer such questions and make cluster approach more inclusive.

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Table 1: Performance of small scale sector

	Employment (Annual Compound growth rates)	No of Units (Annual Compound growth rates)	Gross Output (Annual Compound growth rates)
1977-1992	5.45	10	91.06
1992-2002	5.33	8.97	16.81
2002-03	5.85	4.06	8.67
2003-04	4.40	4.07	9.64
2004-05	4.44	4.07	10.87
2005-06	4.27	4.07	12.32

Source: 1 and 2 census reports of SSI and Economic survey reports

Table 2: Export of small scale industries

Year	Average growth rate (%)
Pre-reform period (1982-1992)	24.26
Post –reform period (1992 – 2006)	18.98

Source: Economic survey reports and (Asra & Prasad, 2011)

Table 3: Main characteristics of Markusen's industrial districts

Indicator	Hub-and-spoke districts	Satellite industrial platforms	State-anchored industrial districts
Business structure dominated by	one or several large, vertically integrated firms surrounded by suppliers	large, externally owned and headquartered firms	one or several large, government institutions surrounded by suppliers and customers
Key investment decisions made	locally, but spread out globally	externally	at various levels of government, some internal, some external
Degrees of cooperation, linkages with external firms	High both locally and externally	High especially with parent company	High
exchanges of personnel	Moderate	High	Moderate
Degree of cooperation among competitor firms	Low	Low	Low
Source of finance	by large firms	provided externally, through firm or external purchase	No specialized sources of finance
Government role	Strong	Strong	Weak
Growth prospects	Long-term prospects	Short-term due to intermediate-term portability of plants and activities elsewhere	Long-term prospects

Table 4: Different types of clusters as per Gulati and Sarkar (2006)

Categorisation	Type of cluster	
Origin	Naturally clusters which evolved by themselves	Induced which evolve through special policy measures
volume of business	Large	Small
relationship among firms	Vertical cluster which consists of one or a few large enterprises and a large number of other small supplier enterprises	Horizontal cluster which consists of a large number of small & medium sized enterprises (often in hundreds) that may produce and market directly while competing with one another
Nature of business	Exporting	Non-exporting

Table 5: Brief description of selected clusters

Cluster	Products
Coir cluster of Alleppey	Mats, mattings, etcetera, ropes
Machine tools cluster of Bangalore	Metal cutting machines
Chanderi Handloom cluster	Pagri, saris, dupattas
Chittoor Fruit Processing cluster	Fruit pulp, concentrate and purees
Heavy Engineering fabrication cluster of Trichy	Boilers, heat exchangers, pressure vessels
Solapur terry towel cluster	Bed sheets, towels
Brass and bell metal cluster of Rengali	Metal products
Floriculture cluster of Pune	Flower cultivation
Crochet lace cluster of Narsapur	Dollies, furnishings, garments, tablemats
Mojari clusters of Rajasthan	Handcrafted ethnic footwear (Mojari)
Hosiery cluster of Ludhiana	Woollens, acrylic and acrowool / wollens

Cluster	Products
Rubber cluster of Kottayam	Rubber products like rubber mats, rubber bands, Hawaii chappals
Kannaur handloom cluster	Table, kitchen and bed linen, furnishings, curtains, fabrics (shirts), dhotis
Brass parts cluster of Jamnagar	Machinery tools, jigs, fixtures, electrical pins, holders, cycle tube wars
Hosiery cluster of Tirupur	Undergarments, T-shirts, cardigans, jergeys, pullovers, nightwear, ladies' blouses, skirts, trousers, sportswear
Hand block printed textile cluster of Jaipur	Hand printed products
Diesel engine and engineering cluster of Rajkot	Diesel engine, pumps, watch cases
Wet grinder cluster of Coimbatore	Grinders
Bidri cluster of Bidar	Flower vase, metal and silver products
Stone carving cluster of Konark	Handcrafted stone products

Source: (FMC, 2006), (Das et al., 2007), Russo et al., (2000), and (Planning Commission, 2012)

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