

# Cluster Development – A Systematic Literature Review, Challenges and Research Agenda

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## Abstract

The development of Industrial and Artisan Clusters is identified as a crucial strategy for enhancing regional competitiveness, fostering innovation, and creating more inclusive economic avenues, particularly in developing regions. Despite substantial research into the dynamics of these clusters, inconsistencies remain, mainly due to fragmented theoretical frameworks and an overemphasis on High-Tech Clusters in developed nations. This study conducts a systematic literature review that employs the PRISMA framework, assessing 61 peer-reviewed articles published from 1995 to 2024 across various industries and geographic contexts, specifically focusing on Low-Tech and Artisan Clusters. Major findings highlight significant barriers to cluster development: inadequate infrastructure, limited access to finance, weak institutional coordination, and policy inconsistencies. On the flip side, key drivers that facilitate the development and sustainability of these clusters include knowledge transfer mechanisms, innovation-supporting networks, government backing, and collaborative value creation initiatives. This review provides valuable insights for future research aimed at reinforcing Cluster Ecosystems and informing Policy Interventions, thus addressing the critical gaps in current understanding of Low-Tech and Artisan Cluster dynamics.

**Keywords:** *Cluster Development, Industrial Clusters, Institutional support, Governance*

## 1. Introduction

There has been increasing acknowledgment that industry clusters are significant for the economic development of any country (Anić et al., 2019) and show exceptional competitive superiority (Delgado et al., 2010), outstanding vigor, and a strong stimulus effect on the regional economy (Hashino & Otsuka, 2013). In addition to the inherent productive advantages of close relationships, clusters can promote high wages by facilitating the production of novel goods and services that are in great demand (Schoales, 2006). As a regional development strategy, cluster-based economic development (CBED), has drawn a lot of interest (Paraušić et al., 2017) in an era of globalization. Clustering contributed to a positive impact (Royo-Vela et al., 2022) on the market performance of small and medium enterprises (SMEs).

Cluster-based rural industrialization was crucial to the early phases of industrialization in many European and other Asian nations (World Bank, 2008) and contributed to rural income growth, poverty reduction, and lower income inequality (Guo et al., 2022). Research demonstrates that areas with robust entrepreneurial activity bases and clusters foster start-ups, which in turn generate employment and a positive correlation between the inventiveness of entrepreneurs and their aspirations to engage in social entrepreneurship (Navickas & Malakauskaite, 2009) and positively influences the innovativeness of firms. Industry clusters are a convenient analytical tool for assessing the structure of a regional economy and understanding how its regional economy functions. The clustering of firms helps in the growth of total production (Paraušić et al., 2017), employment generation (Behrens et al., 2020, Tambunan, 2005) and export market (Hashino & Otsuka, 2013).

Even though during the past three decades, our knowledge of clusters and their effect on economic performance has grown. Still, there is a lack of consensus on the definitions of clusters partly because the cluster literature is fragmented over various disciplines of economic geography (Asheim et al. 2008), development study, business, management, planning (Turok and Bailey 2004), political science (den Hertog et al. 2001; Lazzeretti et al., 2014)), sociology and technology and have different applications and characteristics. Every viewpoint has an emphasis on how location affects performance and sometimes these are disconnected from each other. The cluster concept has also been described as 'chaotic' (Martin & Sunley, 2003), while other literature suggests the significant features: multidisciplinary, cross-disciplinary, and global dimension, with success (Lazzeretti et al., 2014). Furthermore, it has completely infused political discourse, inspiring the creation of various policy initiatives in numerous nations (OECD, 2007).

Cluster theory can be traced back to the groundbreaking work of Michael Porter (1998, 2000), who views clusters as geographically localized assemblies of interrelated firms and institutions that contribute to the productivity, innovation, and competitive advantage. Porter posited that the closeness would create knowledge spillovers, specialized inputs, and collaborative efficiencies as the base of strategic foundation of the economic development of the regions. His model changed the perspective of the idea of competitiveness by focusing on individual firms into the localized ecosystems, which affected the global policy and the scholarly discussion of the development based on clusters. Porter (2000) demonstrated that, as opposed to vertical integration, union with foreign businesses, or importing the inputs from far-off places, cluster involvement can supply less priced and more accessible specialized inputs, such as machinery and equipment, components, and business services. Michael Porter's cluster theory, however, has been adopted by policymakers across the world (Swords, 2013). Furthermore, firms in a region connected to exchange technology and information, provide specialized services and prepare labor for employment become more inventive and competitive than firms operating independently. The creation of different industrial clusters helps in understanding and evaluating national and international policies and the growth of these clusters can be achieved by a multilateral approach with the inclusion of the influential factors (Danesh Shakib, 2020).

The cluster idea has been widely discussed by Porter (1998) and others (Feldman & Francis, 2004; Schmitz & Nadvi, 1999; Lazzeretti et al., 2014, Abbasiharofteh & Dyba, 2018 ;Thesis & Resbeut, 2021; Martin & Sunley, 2003). Research findings show that cluster-related literature has mostly concentrated within the academic fields relating to geography, urban studies, and regional development (González-torres et al., 2020) and urban planning, while the scarcity of studies being conducted in business and management, and development disciplines (Bloom et al., 2020 ). In the past, attempts have been made to use SLR to identify different cluster development components from a strategy perspective (Lazzeretti et al., 2014). A deeper understanding of cluster drivers and barriers may provide a better opportunity to understand the clusters and this task is difficult due to the lack of literature dedicated to cluster barriers, and this area of the cluster is somewhat under-researched (Hall, 2012).

Digital and technology ecosystems are significantly transforming how industrial and innovation clusters function by introducing platform-based coordination, data-driven specialization, and networked collaboration across traditional space. Digital platforms drastically reduce transaction costs and facilitate real-time coordination amongst specialized suppliers, producers, and customers, which increases the speed of compatible supply and demand matches compared to conventional cluster mechanisms (Porter, 1998; OECD, 2019). Added to the cluster landscape, this digital layer enhances scale-up, whereby firms can corner additional value through the integration of complementary services, share aspects of production capabilities, tap into specialized labor pools, and take advantage of distributed knowledge assets over large distances (Kenney & Zysman, 2016). As a consequence, clusters generate very new efficiencies and significantly improved agility, which allows for effective responses to changing market conditions and technology disruptions.

In addition, the increased data flows and shared digital standards promote knowledge spillovers among clusters and promote modularized forms of innovation, through which firms can build-off each other's innovations (Nambisan, 2017). Data and digital infrastructures lower barriers to entry for startups and micro-enterprises by facilitating the ability for these firms to "plug into" established platforms without incurring legacy costs (Goldfarb & Tucker, 2019). This ultimately fuels entrepreneurial activity and supports the emergence of new niche markets within cluster ecosystems. Through data-driven learning, cluster firms are able to optimize resource allocation, streamline value chains and collaborate more effectively with research institutions, industries, and global markets. Consequently, digital technologies and data reconfigure clusters into dynamic and interconnected ecosystems that encourage continual innovation, inclusive participation, and enhanced economic resilience (UNIDO, 2020).

The major research in the clusters segment is focused on high-tech sectors (Giuliani, 2013) in developed regions and literature is scarce in less-developed regions, especially in mature, low-tech industries (Pavelkova et al., 2021). Modern theories like cluster development, which support cluster development processes by effective cluster development plans, are frequently disregarded or underutilized in emerging countries like India (Pachouri & Sharma, 2016). Case studies of rural clusters in India show that public and commercial institutions are not well-coordinated, do not have a progressive vision, and do not understand the context in which these clusters operate (Das, 2015). Literature suggests considering the success of the cluster development approach, it is imperative to understand the barriers that are hindering the growth of the clusters (Mohamed, 2022).

The primary objective of this article is to review cluster research with the main thematic area explored by the literature dealing with cluster development and explore the key facilitators and inhibitors

that impact the strategic implementation and success of cluster development. By doing this, the study not only offers a summary of barriers and drivers of cluster development, but also broadens the viewpoint to pinpoint areas that might influence the artisan-based cluster development initiatives down the road. This necessitates more advanced planning and policy interventions that acknowledge the possibility of maintaining the traditional artisan-based clusters while expanding upon and innovating around the heritage of highly skilled design and production methods. The remaining section of the paper is organized as follows. Section 2 presents the research method utilized in the paper. In Section 3, the results are approached through descriptive analyses and discussed. Section 4 presents the barriers and drivers of the cluster development, in addition to a research agenda. Finally, Section 5 provides the main conclusions, managerial implications, and limitations.

## 2. Theoretical Framework

### ➤ Resource-Based View (RBV) Theory

Resource-Based View (RBV) theory is a theory that explains how companies and groups of companies derive a long-term competitive advantage by having distinctive, valuable, rare, inimitable, and non-substitutable (VRIN) resources. Regarding the context of cluster development, RBV points out that clusters perform well when companies jointly apply specialized resources, including technological expertise, pools of skilled workers, localized knowledge spillovers, and shared infrastructures (Freeman et al., 2021). The closer the resources are to each other and the more they interact, the more strength they gain, and in fact, through clusters, firms are more likely to innovate quicker, produce at lower costs, and react promptly to alterations in the market (Shibin et al., 2020). RBV is also keen on the contribution of intangible resources such as reputation, shared learning, and tacit knowledge, which are particularly concentrated in well-established clusters. Therefore, the theory offers a powerful present of how resources heterogeneity and capability creation contribute to the success and strength of industrial and technology clusters (Barney et al., 2021).

Nevertheless, there are also issues of clusters where the firms are not in a position to convert their shared resources into competitive results due to their lack of capability. Inequality in resources distribution, ability differences between small and large companies, and lack of absorptive capacity can inhibit the process of innovation and cooperation in clusters (Gerhart and Feng 2021). Also, digital transformation, disruption around the globe, and speedy technological change demand clusters to establish dynamic capabilities including agility, digital preparedness, and adaptability. RBV-informed research agenda would look into the ways clusters develop shared competencies, the way digital resources redefine competitive advantages, and how resource coordination among institutions advance cluster performance (Shibin et al., 2020). The next generation of research can also address the interaction between tangible and intangible resources in hybrid offline-online cluster ecosystems, especially in new knowledge-intensive industries (Warner & Wäger, 2019).

### ➤ Institutional Theory

The institutional theory describes the influence of formal and informal institutional pressures on organizational behaviors, structures, and practices in clusters. In cluster creation, organizations like the regulating agencies, industry associations, universities, and government departments develop norms and regulations, and incentives that affect the manner in which firms collaborate, innovate, and compete (Li and Bosma 2025). Normative pressures such as professional organizations influence what firms within a cluster should expect of the dissemination of knowledge and technological advancement, whereas coercive pressures such as government policies and industrial regulations can make firms within a cluster to adopt same production standards, or embrace the same sustainability practices (Sahin and Mert 2023). The role of mimetic pressures is also present, as in the cases of developing clusters, firms tend to replicate the successful experiences of leading global clusters with the aim of reducing uncertainty or increasing legitimacy. Consequently, the institutional theory is quite useful in explaining the impacts of external and internal governance structures on cluster evolution (Jepperson and Meyer 2021).

Nevertheless, institutional factors persist in negatively affecting the development of clusters in most areas and these problems include bureaucratic inefficiencies, lack of regular policy support, poor enforcement procedures, and lack of alignment of institutional participants. Such institutional gaps are likely to make clusters fragmented, less collaborative, and slower in the diffusion of innovations (Voronov and Weber 2020). An institutional theory-informed research agenda notes the necessity to investigate the role of digital governance, innovation policies, and institutional entrepreneurship in helping cluster institutions to become more adaptive and resilient (Vadasi et al., 2020). Besides, researchers emphasize the necessity of analyzing the impact that new institutions, including digital platforms, smart regulatory

systems, and transnational networks of innovation, have on the institutional environment of clusters. As more clusters come to be based on hybrid offline-online ecosystems, future studies are encouraged to examine how the logics of institutions change according to networked, knowledge-intensive, and digitally mediated cluster conditions (Jepperson and Meyer 2021).

➤ **Social Capital Theory**

The social capital theory underlines the value created using network, trust, norms and shared social structure and therefore it has much relevance in the case of cluster development. Social capital has implications on knowledge sharing, collaborative innovation and inter-firm learning in clusters (Kasim et al., 2022). Trust based relationship helps firms to mutualize sensitive technological information, lowers the transaction cost and undertakes jointly, the R&D or market expansion venture. Bonding social capital enhances the cohesion effect within homogeneous groups, whereas bridging social capital relates firms with various networks which aid the company to acquire access to the new markets, talents and technological possibilities (Thomas and Gupta 2021). Collective efficiency is also increased by social capital, which helps in problem-solving collectively, developing a coherent strategy, and supporting each other among companies in the cluster (Martin et al., 2020).

Although social capital in clusters is an important phenomenon, the challenges it encounters include inequality of access to networks through networks, over embeddedness and indicated exclusive formation of sub-groups that impede the flow of knowledge. Weakly bridged clusters tend to be less adaptable and competitive in integrating new entrants or connecting to the world of innovation, as it is difficult to involve them (Gannon and Roberts 2020). The social capital theory is an informed research agenda that emphasizes the need to study how digital platforms, online communities, and hybrid networking spaces redefine the generation and mobilization of social capital within clusters (Bosua and Evans, 2024). With the rise in the digitalization pace, further studies ought to explore the effects of virtual interaction on the development of trust, the quality of collaboration, and the intensity of knowledge-sharing in new digital physical cluster settings, bringing new knowledge of how social capital works under the new conditions of digitalization (Thomas and Gupta 2021).

**3. Review Structure and Methodology**

A scientific method-based literature review that complied with the PRISMA statement was conducted to produce transparent, egalitarian, and inclusive results. The phases were modified based on particular characteristics from comparable previous work proposed in the literature (Moher et al., 2009). The review was conducted using the databases Scopus, Google Scholar, Web of Science, and Science Direct, which were utilized to find papers for the literature review. To find further pertinent literature, we performed a backward citation analysis by selecting the relevant references from the shortlisted publications. Literature from several databases was included based on a search using keywords such as cluster development, industrial cluster knowledge management. Figure 1 represents the search string combination.

**3.1 Literature search**

**Table 1: Description of parameters**

|                                       |           |
|---------------------------------------|-----------|
| Description of the sample             |           |
| Metric                                | Results   |
| Timespan                              | 1995-2024 |
| Total number of articles              | 61        |
| Source journals                       | 41        |
| Average citation per article          | 744       |
| Average citation per year per article | 37        |

|                  |     |
|------------------|-----|
| Authors keywords | 246 |
|------------------|-----|

### 3.2 Article Selection

The study conducted a search process that involved identification, screening, eligibility, and inclusion as illustrated in Figure 2 and articles were identified based on the keyword search in the article title, abstract, and article keyword sections. Online catalogs, research reports, and database features were used to search other sources, cited references, keywords, and surveyed literature. The inclusion, exclusion, and quality assessment criteria for vetting pertinent articles based on search results are as follows.

#### 3.2.1 Inclusion criteria

- **Publication Type:** Journal articles with full text are only considered. The initial level screening was performed on the title, keywords, and abstract. The major research fields used are business and management, economics, econometrics, geography, planning & development, public administration accounting, and finance, written in English.
- Research directly related to cluster development, industrial districts, and knowledge management.

#### 3.2.2 Exclusion criteria

- Books, reviews, dissertations, white papers, technical papers, non-English papers, and non-peer-reviewed publications are not considered.
- Research items that appeared repeatedly in search results and papers on cluster development that don't specifically address clusters or industrial districts or cluster development-related knowledge management
- software programs for performing cluster analysis.
- clustering algorithm and clustering analysis.

Following the systematic procedure outlined in the study methodology section, this paper's literature evaluation encompasses 61 different periodicals (outlined in Table 1). Nine of the Fifty-nine articles that were chosen for evaluation were classified as A\* by the 2019 ABDC journal quality list; the remaining twenty-nine were classified as A, four as B, five as C category journals, and 14 as others. Moreover, nine papers were excluded from both the Scopus database and the ABDC quality list. <Table 2 > represents the complete details of the category.

The assessed literature referenced references, and other sources were searched using online catalogs, government reports, and database features. This method of indexing citations is similar to going backward or forwards on a bibliographic trail—that is, locating research articles from a paper's reference list (Sherman et al., 2009). In total, the search yielded 1194 (1132 papers from databases and 45 papers from bibliographic trail search) documents. After removing the duplicates, 1140 articles remained for review. In the next step, the number of relevant articles was further narrowed down based on exclusion, inclusion, and quality assessment criteria and this brought down the number to 214 articles. 163 papers were filtered and excluded from the study in the next iteration. Finally, 61 research papers were encompassed for literature synthesis.

**Table 2: Journal category**

| Sr. No | ABDC Journal Category | Count | Total % |
|--------|-----------------------|-------|---------|
| 1      | A*                    | 9     | 15      |
| 2      | A                     | 29    | 48      |
| 3      | B                     | 4     | 7       |
| 4      | C                     | 5     | 8       |
| 5      | other                 | 14    | 23      |

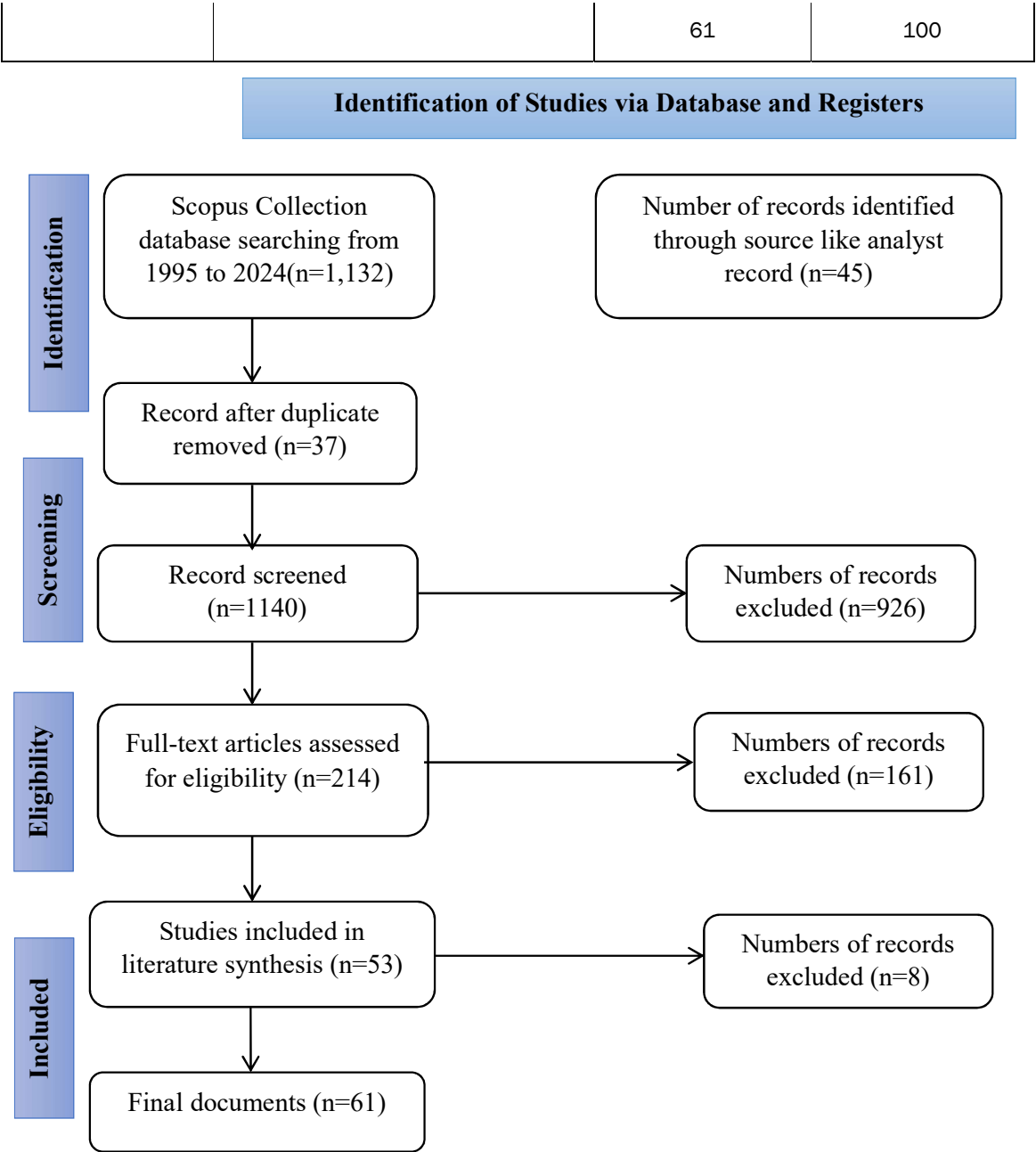


Figure 1: PRISMA Model (Moher et al., 2009)

PRISMA methodology was chosen to make the literature review process transparent, reproducible, and rigorously structured to conduct a screening and selection process. Its systematic recording of each step, i.e., identification to final inclusion, raises methodological validity and reduces selection bias, thus contributing to the validity of the synthesized results. The PRISMA flow diagram displays the process of identifying, screening, and determining which studies were retained for the final synthesis of studies in the literature. The search found a potential total of 1,177 records identified, of which 1,132 had been identified via Scopus database search (1995–2024), in addition to the identification of 45 other records through analyst sources. After following the procedures to remove 37 duplicates from the list of records, then left with a total of 1,140 studies to screen. Screening the identified records—using titles and abstracts—resulted in the exclusion of 926 studies for a variety of reasons. This led to the review of 214 full-text articles to determine eligibility. Ultimately, after reviewing the 214 full-text self-evaluation to determine eligibility for which articles met inclusion criteria, it ended up excluding an additional 161 articles that did not meet the inclusion criteria based on journal articles which had a variety of publication

standards. In total, this resulted in 53 studies being eligible for inclusion in the literature synthesis. Even after synthesizing these 53 studies and further excluding 8 studies or other articles, it left with 61 original studies that were determined to be the core body of evidence reviewed in this study. Overall, this systematic process illustrates a careful process for the selection of studies meeting the rigorous methodology required by the study and that is also relevant and high-quality work included in this research.

#### 4. Results

The body of the cluster development research has become fragmented along diverse perceptions (Hervas-Oliver et al., 2015). The literature has shown how traditional empirical techniques can be effectively combined with qualitative, contextual elements that allow for a broader perspective on policy and measuring the true impact of clusters and cluster policies. The literature review indicates the various definitions of the cluster and there is less symmetry in the challenges the sustainable cluster development ecosystem faces while achieving transformation. Literature suggests that contemporary definitions take into account elements like information and knowledge sharing, innovation, and global networks, while early definitions concentrated on geographic closeness (Morosini, 2004).

The definition of a cluster differs widely across the literature due to the different range of conceptual approaches, historical evolution, diverse typologies, theoretical foundations, distinct characteristics of the industries, diverse policy priorities, economic and social perspectives, and settings in which the term is used. These variances reflect clusters' complexity and multidimensional nature, ranging from the local context to regional, informal networks to internationally competitive industrial hubs. Moreover, there is a need to understand the difference between an industry-based cluster and an artisan-based cluster. An artisan-based cluster is defined as a geographically concentrated household unit or group of individuals producing some products (Venkataramanaiah & Kumar, 2011). Clusters also include those involved in creative industries, which are activities-based industries based on intellectual property that are culturally and scientifically grounded, and have the potential to create value and jobs (Namyślak, 2020).

In the context of knowledge transfer, cluster research emphasized the value of unofficial social ties, such as those with family members (Morosini, 2004) which helps in the transmission of knowledge from one generation to another (Dias et al., 2020). According to the theory of competitive industries, businesses gravitate toward locations with comparable industrial clusters to take advantage of the cluster's competitive advantages (Sosnovskikh, 2017). According to cluster theory, organizations that interact well in local settings and clusters can gain a significant competitive edge in the global market (Osarenkhoe & Fjellström, 2017). Thus, the sustainable development of the cluster depends heavily on both competition and collaboration (Sosnovskikh, 2017).

**Table 3: Sources of Cluster Development Literature**

| Bibliographic Source                                               | Articles Reviewed | Total % |
|--------------------------------------------------------------------|-------------------|---------|
| Research Policy                                                    | 6                 | 9.8     |
| Journal of Business Research                                       | 6                 | 9.8     |
| World Development                                                  | 5                 | 8.2     |
| Benchmarking: An International Journal                             | 3                 | 4.9     |
| China Economic Review                                              | 2                 | 3.3     |
| Innovation & Management Review                                     | 2                 | 3.3     |
| Journal of Knowledge Management                                    | 2                 | 3.3     |
| Technological Forecasting & Social Change                          | 2                 | 3.3     |
| African Journal of Science, Technology, Innovation and Development | 1                 | 1.6     |

|                                                                  |   |     |
|------------------------------------------------------------------|---|-----|
| Asian Journal of Innovation and Policy                           | 1 | 1.6 |
| City, Culture and Society                                        | 1 | 1.6 |
| Computers & Industrial Engineering                               | 1 | 1.6 |
| Economic Development Quarterly                                   | 1 | 1.6 |
| Eastern Journal of European Studies                              | 1 | 1.6 |
| Economic Geography                                               | 1 | 1.6 |
| Entrepreneurship and Regional Development                        | 1 | 1.6 |
| EuroMed Journal of Business                                      | 1 | 1.6 |
| European Planning Studies                                        | 1 | 1.6 |
| Finance Research Letters                                         | 1 | 1.6 |
| Harvard Business Review                                          | 1 | 1.6 |
| Heliyon                                                          | 1 | 1.6 |
| Industrial Management & Data Systems                             | 1 | 1.6 |
| International Journal of Productivity and Performance Management | 1 | 1.6 |
| Journal of Cleaner Production                                    | 1 | 1.6 |
| Journal of Comparative Economics                                 | 1 | 1.6 |
| Journal of Development Studies                                   | 1 | 1.6 |
| Journal of Management Development                                | 1 | 1.6 |
| Journal of New Business Ideas and Trends                         | 1 | 1.6 |
| Journal of Rural Studies                                         | 1 | 1.6 |
| Journal of Small Business Management                             | 1 | 1.6 |
| Journal of Strategic Information Systems                         | 1 | 1.6 |
| Regional Science and Urban Economics                             | 1 | 1.6 |
| Regional Science Policy & Practice                               | 1 | 1.6 |
| Regional Studies                                                 | 1 | 1.6 |
| Social Sciences                                                  | 1 | 1.6 |

|                                                           |    |       |
|-----------------------------------------------------------|----|-------|
| South African Journal of Economic and Management Sciences | 1  | 1.6   |
| South Asian Journal of Business and Management Cases      | 1  | 1.6   |
| Strategic Management Journal                              | 1  | 1.6   |
| Sustainable Production and Consumption                    | 1  | 1.6   |
| Technology in Society                                     | 1  | 1.6   |
| World Development Perspectives                            | 1  | 1.6   |
| Total                                                     | 61 | 100.0 |

Table 4 shows the literature's different definitions of the cluster.

**Table 4: Cluster definitions**

| Cluster Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Author(s) and year                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| "A cluster is a sizable agglomeration of firms in a spatially delimited area which has a distinctive specialization profile and in which interfirm specialization and trade is substantial"                                                                                                                                                                                                                                                                                        | Altenburg and Meyer-Stamer (1999) |
| "Spatial configurations of economic activity, which articulate a wide range of economic agents (firms, producers, suppliers, service providers, universities, research institutes, governmental agencies, financial systems, consultants, clients, etc.) that interact in proximity. This combination of capabilities, under a peculiar institutional frame, can be seen as promoting local competitive advantage, innovation, and growth"                                         | Almodovar and Teixeira (2009)     |
| "A strong collection of related companies located in a small geographical area sometimes centered on a strong part of a country's science base"                                                                                                                                                                                                                                                                                                                                    | Baptista and Swan (1998)          |
| "A geographical grouping of firms that belong predominantly to one activity sector"                                                                                                                                                                                                                                                                                                                                                                                                | Bisso (2003)                      |
| "A regional cluster is an industrial cluster in which member firms are in close proximity to each other"                                                                                                                                                                                                                                                                                                                                                                           | Enright (1996)                    |
| "as geographical concentrations of firms in one or a limited number of adjacent industries that form cooperative and competitive networks together with the institutions of environment"                                                                                                                                                                                                                                                                                           | Gancarczyk (2015)                 |
| "The definition of industry cluster we use states that cluster relationships can be built around buy-sell relationships (also known as customer-supplier relationships or forward and backward linkages) between the driver industries and others in the complex, the use of common technologies among establishments in the driver industries and other industries in the cluster, or scarce occupations or a very particular skill set that exists in the regional labor market" | Hill and Brennan (2000)           |
| "referred to as 'locational economies' and embraces those economies that arise from geographical agglomeration of related economic activities...the territorial configuration most likely to enhance learning processes"                                                                                                                                                                                                                                                           | Maskell (2001)                    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| “A cluster is a group of enterprises located within an identifiable and as far as practicable, contiguous area or a value chain that goes beyond a geographical area and producing same/similar products/complementary products/services, which can be linked together by common physical infrastructure facilities that help address their common challenges”                                                                                                                                                           | Ministry of Micro, Small & Medium Enterprises (MoMSME) |
| “An industrial cluster is 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. Within an industrial cluster, a significant part of both the social community and the economic agents work together in economically linked activities, sharing and nurturing a common stock of product, technology and organizational knowledge in order to generate superior products and services in the marketplace” | Morosini (2004)                                        |

The descriptions of clusters provided by different scholars have all had an effect of highlighting the geographical density, interdependence, and interaction that are characteristic of industrial and economic clusters. Although words are used differently, three fundamental concepts are united in the interpretations and these include; geographical proximity, sectoral or technological relatedness, and mutually reinforcing relationships among firms, institutions and supporting organizations. Other researchers like Almodovar and Teixeira (2009) and Morosini (2004) emphasized the more encompassing ecosystem of universities, government agencies, and research centers supporting innovation and competitiveness, but other researchers like Altenburg and Meyer-Stamer (1999), Enright (1996), and Bisso (2003) emphasize physical agglomeration. Inclusion in definitions by Hill and Brennan (2000) and a definite emphasis on flows of knowledge, specialization of skills, and shared technologies by the MoMSME definition, additions to the concept by both authors include value-chain bondages that may not necessarily be geographically fixed. In general, clusters may be seen as dynamic socio-economic systems in which a combination of proximity, specialization, and institutional support all increases productivity, creates an environment that encourages innovation and also helps firms deal with common challenges better than they could individually.

Table 5: Ranking of Top articles

| Rank | Title of the research article                                                                      | Author(s) and year         | ABDC List | TC/t | TC    |
|------|----------------------------------------------------------------------------------------------------|----------------------------|-----------|------|-------|
| 1    | Clusters and the New Economics of Competition                                                      | Porter (1998)              | A         | 842  | 21901 |
| 2    | Location, competition, and economic development: Local clusters in a global economy                | Porter (2000)              | B         | 381  | 8771  |
| 3    | Clusters, convergence, and economic performance                                                    | Delgado et al. (2014)      | A*        | 127  | 1274  |
| 4    | The micro-determinants of meso-level learning and innovation: evidence from a Chilean wine cluster | Giuliani and Bell 2005     | A*        | 97   | 1842  |
| 5    | Do firms in clusters innovate more?                                                                | Baptista and Swan 1998     | A*        | 86   | 2243  |
| 6    | Clustering and Industrialization - Introduction                                                    | Schmitz and Nadvi (1999)   | A         | 70   | 1743  |
| 7    | How to Promote Clusters: Policy Experiences from Latin America                                     | Altenburg and Meyer-Stamer | A         | 49   | 1227  |

|    |                                                                                                                          |                           |    |    |     |
|----|--------------------------------------------------------------------------------------------------------------------------|---------------------------|----|----|-----|
|    |                                                                                                                          | (1999)                    |    |    |     |
| 8  | Knowledge flows through informal contacts in industrial clusters: myth or reality                                        | Dahl and Pedersen (2004)  | A* | 44 | 884 |
| 9  | Identifying enablers of technological innovation for Indian MSMEs using best–worst multi criteria decision making method | Gupta and Barua (2016)    | A  | 44 | 353 |
| 10 | The effects of industry cluster knowledge management on innovation performance                                           | Lai et al. (2014)         | A  | 44 | 437 |
| 11 | Network dynamics in regional clusters: Evidence from Chile                                                               | Giuliani (2013)           | A* | 38 | 421 |
| 12 | How can clusters sustain performance? The role of network strength, network openness, and environmental uncertainty      | Eisingerich et al. (2010) | A* | 38 | 531 |

TC/t = Average total citations per year: TC = Total citations

The list of the leading research articles on clusters indicates the intellectual basis and development of the cluster theory illustrating the role of influential articles in the formation of academic and policy discourses of regional competitiveness, innovation, and flows of knowledge. The list is dominated by Porters seminal contributions (1998, 2000) which have exceptionally high citation levels and the key one in the discussion of clusters as drivers of competitive advantage in the globalized economies. The articles by Delgado et al. (2014), Giuliani and Bell (2005), and Baptista and Swan (1998) are highly cited A+ articles that add more empirical evidence on the benefits of clustering in promoting innovation, learning, and firm performance. The contributions of Schmitz and Nadvi (1999) and Altenburg and Meyer-Stamer (1999) focus on the industrialization and policy perspectives, whereas Dahl and Pedersen (2004) and Giuliani (2013) put more emphasis on the significance of informal networks and knowledge dynamics. The most recent works, including Gupta and Barua (2016) and Lai et al. (2014), demonstrate that the cluster research remains relevant in terms of emerging economies and technological innovation. In general, the ranking indicates a combination of the classical theories and the modern empirical research and proves the timelessness of the cluster research in different fields and on the international level.

**Table 6: Major Industries**

| Cluster Industry           | Count | Author(s) and year                                                                                                                        |
|----------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Furniture                  | 7     | Beerefoot (2008); Chung, Y. C. (2019); Das (2015); Ferreira et al. (2022); Hoffmann et al. (2014) ; Sellitto et al. (2020); Shakib (2020) |
| Agro / Potato / Rice Mill  | 3     | Otsuka and Ali (2020); Singh and Shrivastava (2013); Zhang and Hu (2011)                                                                  |
| Electronic / Semiconductor | 2     | Kim et al. (2022); Park et al. (2014)                                                                                                     |
| Textile                    | 2     | Arimoto et al. (2014); Bellandi and Lombardi (2012)                                                                                       |
| Bicycle                    | 1     | Gerke et al. (2023)                                                                                                                       |
| Craft                      | 1     | Rathnayake and Grodach (2022)                                                                                                             |

|                                    |   |                              |
|------------------------------------|---|------------------------------|
| Embroidery                         | 1 | Ruchi Tyagi (2012)           |
| Energy                             | 1 | Jaegersberg and Ure (2011)   |
| Flower                             | 1 | Mano et al. (2011)           |
| Terracotta, Bamboo craft           | 1 | Das (2015)                   |
| Garment                            | 1 | Sonobe et al. (2002)         |
| Iron and steel                     | 1 | Nam et al. (2009)            |
| Knitwear                           | 1 | Meenu Tiwari (1999)          |
| Maritime                           | 1 | Osman et al. (2022)          |
| Medical                            | 1 | McKernan and David (2024)    |
| Leather, small goods, and hardware | 1 | Bellandi and Lombardi (2012) |
| Toy                                | 1 | Balland et al. (2016)        |
| Wood industry                      | 1 | Vigan`o et al. (2023)        |

The fact that cluster-related studies have been distributed widely in industries indicates the broad applicability of the cluster theory, and where the dynamics of clustering have been most studied. Furniture industry has seven studies and this makes it the most studied industry on the basis of its good tradition of localized systems of production, network of craftsmanship and the chain of localized value. Agro-based clusters such as potato and rice mill industries also enjoy a lot of attention as they are considered as vital in rural development and modernization of supply chains. The high-technology segments like electronics and semiconductors and the traditional segments like textiles all feature in various research fields as evidence of the interest in both advanced and labor intensive clusters. The other industries, which include bicycles, craft, embroidery, energy, flowers, terracotta, garments, iron and steel, knitwear, maritime, medical, leather goods, toys and wood indicate that cluster studies cut across a very broad economic spectrum. This diversity demonstrates the flexibility of cluster models to examine the process of innovation, competitiveness, and socio-economic connections in industries of the traditional craft and in technologically advanced economies.

**Table 7: Major Countries**

| Sr. No | Country | Count | Author(s)                                                                                                                                        |
|--------|---------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | China   | 7     | Ai & Wu. (2016); Bellandi & Lombardi (2012); Guo et al. (2022); Huang et al. (2008); Sonobe et al. (2002); Yang & Zhou (2021); Zhang & Hu (2014) |
| 2      | India   | 6     | Bhawsar & Chattopadhyay (2018); Das (2015); Gupta & Barua (2016); Tiwari (1999); Tyagi (2012); Singh & Shrivastava (2013)                        |

|    |                |   |                                                                                                                                      |
|----|----------------|---|--------------------------------------------------------------------------------------------------------------------------------------|
| 3  | USA            | 6 | Altenburg & Meyer-Stamer (1999); Delgado et al. (2014); Jaegersberg & Ure (2011); Kim et al. (2022); Porter (2000); Rosenfeld (2005) |
| 4  | Brazil         | 4 | Ferreira et al. (2022); Fioravanti et al. (2023); Hoffmann et al. (2014); Sellitto et al. (2020)                                     |
| 5  | Europe (Mixed) | 3 | Hyk et al. (2022); Jaegersberg & Ure (2011); Turkina et al. (2019)                                                                   |
| 6  | Chile          | 2 | Giuliani (2013); Giuliani & Bell (2005)                                                                                              |
| 7  | Italy          | 2 | Barboza & Capocchi (2020); Viganò et al. (2023)                                                                                      |
| 8  | Spain          | 2 | Balland et al. (2016); Casanueva et al. (2013)                                                                                       |
| 9  | Taiwan         | 2 | Gerke et al. (2023); Lai et al. (2014)                                                                                               |
| 10 | Tanzania       | 1 | Chung, Y. C. (2019)                                                                                                                  |
| 11 | Australia      | 1 | Mitchell et al. (2014)                                                                                                               |
| 12 | Austria        | 1 | Eisingerich et al. (2010)                                                                                                            |
| 13 | Bangladesh     | 1 | Liton et al. (2016)                                                                                                                  |
| 14 | Canada         | 1 | Eisingerich et al. (2010)                                                                                                            |
| 15 | Japan          | 1 | Arimoto et al. (2014)                                                                                                                |

As can be seen, the country -wise distribution of cluster research is well geographically concentrated in China, India and USA, which are diverse in terms of their industrial base as well as their active participation in cluster development with regard to academic activities. China comes first with eight studies and this marks how fast the country is industrializing and has competitive regional clusters. India and the USA are close behind them as they show interest in traditional and high-tech cluster dynamics. Regions in Europe and Brazil contribute a good deal as well, which means that the cluster theory is relevant globally in the areas of both emerging and developed economies. The context-specific cluster explorations are observed in countries such as Chile, Italy, Spain, Taiwan, and Tanzania and the isolated contributions are observed in Australia, Austria, Bangladesh, Canada, and Japan indicating the involvement of the wider international community.

**Table 8: Objectives and Key Findings of Reviewed Studies on Cluster Development**

| Sr. No. | Author(s) & Year                | Objective of the Study                                     | Key Outcome / Findings                                                                   |
|---------|---------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 1       | Ai & Wu (2016)                  | Examine external knowledge and interdependence in clusters | External and cross-regional knowledge linkages significantly enhance innovation outcomes |
| 2       | Altenburg & Meyer-Stamer (1999) | Analyse cluster types and policy approaches                | Learning-by-interaction and institutional support are central to                         |

|    |                                |                                                         |                                                                                 |
|----|--------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------|
|    |                                |                                                         | cluster upgrading                                                               |
| 3  | Anić et al. (2019)             | Assess value creation in competitiveness clusters       | Heterogeneity among cluster members shapes service expectations and performance |
| 4  | Arimoto et al. (2014)          | Identify productivity drivers in Japanese silk clusters | Both agglomeration and selection effects improve productivity                   |
| 5  | Balland et al. (2016)          | Study informal networks in toy clusters                 | Embeddedness influences knowledge flows more than proximity                     |
| 6  | Baptista & Swan (1998)         | Compare innovation inside vs outside clusters           | Firms in strong clusters exhibit higher innovation rates                        |
| 7  | Barboza & Capocchi (2020)      | Assess employment effects of spillovers                 | Regional specialization increases employment                                    |
| 8  | Beerepoot (2008)               | Study skill transfer in furniture clusters              | Informal learning dominates in low-tech clusters                                |
| 9  | Bellandi & Lombardi (2012)     | Examine market-cluster interaction                      | Specialized markets drive regional growth                                       |
| 10 | Bhawsar & Chattopadhyay (2018) | Measure competitiveness of Indian clusters              | Government and organizational dimensions are critical                           |
| 11 | Casanueva et al. (2013)        | Analyse strategic positioning in clusters               | Central network positions enhance innovation                                    |
| 12 | Dahl & Pedersen (2004)         | Examine informal knowledge sharing                      | Informal ties are crucial for tacit knowledge transfer                          |
| 13 | Das (2015)                     | Identify barriers in artisan clusters                   | Institutional failures and market constraints cause decline                     |
| 14 | Delgado et al. (2014)          | Assess regional cluster performance                     | Strong clusters generate employment and patents                                 |
| 15 | Eisingerich et al. (2010)      | Develop cluster performance model                       | Network openness and strength jointly affect outcomes                           |
| 16 | Fabio Lotti Oliva (2014)       | Study knowledge management barriers                     | Organizational maturity determines KM success                                   |
| 17 | Ferreira et al. (2022)         | Analyse knowledge worker mobility                       | Organizational structure enables effective knowledge flow                       |
| 18 | Fioravanti et al. (2023)       | Examine knowledge transmission                          | Cooperation and institutional ties enhance learning                             |
| 19 | Gerke et al. (2023)            | Study SME upgrading in clusters                         | Horizontal trust-based linkages support upgrading                               |

|    |                          |                                            |                                                            |
|----|--------------------------|--------------------------------------------|------------------------------------------------------------|
| 20 | Giuliani (2013)          | Analyse micro-dynamics of clusters         | Institutional weaknesses hinder global integration         |
| 21 | Giuliani & Bell (2005)   | Examine absorptive capacity                | Knowledge is unevenly distributed within clusters          |
| 22 | Guo et al. (2020)        | Study ambidexterity and innovation         | Tacit knowledge strengthens innovation outcomes            |
| 23 | Gupta & Barua (2016)     | Identify innovation enablers               | Government support and skills drive MSME innovation        |
| 24 | Gusmanov et al. (2021)   | Assess rural development via clusters      | Cluster approach supports sustainable rural planning       |
| 25 | Hassan & Talib (2015)    | Evaluate competitiveness barriers          | Firms co-locate due to incentives, not clustering benefits |
| 26 | Hoffmann et al. (2014)   | Study knowledge flow in furniture clusters | Knowledge transfer occurs even without collaboration       |
| 27 | Huang et al. (2008)      | Examine cluster restructuring              | Policy reforms reshape industrial clusters                 |
| 28 | Jaegersberg & Ure (2011) | Study energy clusters                      | Institutional frameworks shape sustainability              |
| 29 | Kenney & Zysman (2016)   | Analyse platform ecosystems                | Digital platforms reshape cluster coordination             |
| 30 | Lai et al. (2014)        | Study KM and innovation                    | Knowledge management improves firm performance             |
| 31 | Liton et al. (2016)      | Examine handloom clusters                  | Social capital sustains artisan clusters                   |
| 32 | Mano et al. (2011)       | Study flower clusters                      | Market access enhances rural incomes                       |
| 33 | Martin & Sunley (2003)   | Critique cluster theory                    | Conceptual ambiguity limits policy application             |
| 34 | Maskell (2001)           | Examine learning regions                   | Proximity enhances collective learning                     |
| 35 | McKernan & David (2024)  | Analyse medical clusters                   | Knowledge integration improves innovation                  |
| 36 | Mitchell et al. (2014)   | Study wine clusters                        | Knowledge diversity drives innovation                      |
| 37 | Mohamed (2022)           | Identify cluster constraints               | Infrastructure and finance remain key barriers             |
| 38 | Morosini (2004)          | Examine social embeddedness                | Social ties enable tacit knowledge diffusion               |

|    |                                |                                    |                                              |
|----|--------------------------------|------------------------------------|----------------------------------------------|
| 39 | Nam et al. (2009)              | Study steel clusters               | Policy coordination enhances competitiveness |
| 40 | Nambisan (2017)                | Study digital innovation           | Platforms enable modular innovation          |
| 41 | OECD (2007)                    | Analyse cluster policy             | Policy alignment determines cluster success  |
| 42 | Osarenkhoe & Fjellström (2017) | Examine competitiveness            | Collaboration enhances global positioning    |
| 43 | Otsuka & Ali (2020)            | Study agro-clusters                | Technology adoption improves productivity    |
| 44 | Pachouri & Sharma (2016)       | Analyse Indian cluster policy      | Weak implementation limits outcomes          |
| 45 | Park et al. (2012)             | Study semiconductor clusters       | Innovation depends on institutional support  |
| 46 | Pavelkova et al. (2021)        | Examine mature clusters            | Low-tech clusters remain under-researched    |
| 47 | Porter (1998)                  | Develop cluster theory             | Clusters enhance productivity and innovation |
| 48 | Porter (2000)                  | Analyse competitiveness            | Local context shapes global advantage        |
| 49 | Rathnayake & Grodach (2022)    | Study craft clusters               | Cultural value sustains creative clusters    |
| 50 | Rosenfeld (2005)               | Examine cluster networks           | Interaction creates collective advantage     |
| 51 | Royo-Vela et al. (2022)        | Study SME performance              | Clustering improves market outcomes          |
| 52 | Schmitz & Nadvi (1999)         | Examine industrialization          | Collective efficiency drives upgrading       |
| 53 | Sellitto et al. (2020)         | Study green innovation             | Sustainability enhances competitiveness      |
| 54 | Shakib (2020)                  | Analyse cluster governance         | Governance quality affects resilience        |
| 55 | Sonobe et al. (2002)           | Study garment clusters             | Learning and scale improve productivity      |
| 56 | Sosnovskikh (2017)             | Analyse cooperation vs competition | Balance is essential for sustainability      |
| 57 | Swords (2013)                  | Study policy diffusion             | Policy transfer reshapes clusters            |
| 58 | Thomas & Gupta                 | Study social capital               | Trust enhances collaboration                 |

|    |                       |                             |                                         |
|----|-----------------------|-----------------------------|-----------------------------------------|
|    | (2021)                |                             |                                         |
| 59 | Turkina et al. (2019) | Analyse innovation networks | Network diversity improves performance  |
| 60 | UNIDO (2020)          | Study inclusive clusters    | Institutional support enables inclusion |
| 61 | Zhang & Hu (2011)     | Study rice mill clusters    | Technology adoption raises efficiency   |

## 5. Discussion

### 5.1 Barriers and Drivers

Fundamentally, clusters can arise in two ways – as a result of natural processes or based on the initiative of governmental or other institutions (Pavelkova et al., 2021) and can vary in size, breadth, and state of development (Porter, 2000). A key component of regional diversification is agglomeration, and robust regional clusters have a favorable impact on the expansion of regional industries in terms of employment and patent strength as well as the formation of new regional sectors (Delgado et al., 2014). Empirical research suggests that businesses that are a part of a regional cluster have greater success than businesses that are not in terms of promoting innovation and profitability (Schoales, 2006).

Numerous empirical studies have shown that clusters are considered a source of entrepreneurship, creativity, employment generation, and innovation (Delgado et al., 2014, Thesis & Resbeut, 2021). Begum and Abdin (2015) highlighted cluster development's positive impact on employment generation in Bangladesh and highlighted the barriers in four categories as access to technology and skilled workforce, access to credit, suitable policy, and institutional arrangement. Research suggests that the rural area income in the nonfarm sector is higher in the districts having industrial clusters than in the districts without clusters (Guo et al., 2022). Empirical evidence suggests an increase in the tribal artisan income in the Thenzawl handloom cluster in Meghalaya, and discusses the most crucial factors as working capital, marketing, and raw resources (Ramswamy & Kumar, 2013).

**Table 9: Key Barriers and Drivers of Cluster Development Identified from Literature**

| Dimension       | Category                        | Description                                                                                                                                             | Key References                                         |
|-----------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>Barriers</b> | Infrastructure Deficiency       | Inadequate physical infrastructure, logistics bottlenecks, unreliable power supply, and poor digital connectivity hinder cluster growth and efficiency. | Das (2015); Mohamed (2022); UNIDO (2020)               |
|                 | Limited Access to Finance       | Difficulty in obtaining credit, lack of venture capital, and high dependence on informal financing constrain innovation and scaling.                    | Altenburg & Meyer-Stamer (1999); Hassan & Talib (2015) |
|                 | Weak Institutional Coordination | Poor coordination among government agencies, industry associations, and support institutions reduces policy effectiveness.                              | Pachouri & Sharma (2016); Giuliani (2013)              |
|                 | Policy Inconsistency            | Fragmented, short-term, or poorly implemented policies weaken long-term cluster sustainability.                                                         | Swords (2013)                                          |
|                 | Low Absorptive Capacity         | Limited skills, inadequate R&D capability, and weak learning mechanisms restrict knowledge utilization.                                                 | Giuliani & Bell (2005); Shibin et al. (2020)           |
| <b>Drivers</b>  | Knowledge Spillovers            | Geographic proximity and informal networks facilitate learning, innovation, and tacit                                                                   | Porter (1998); Morosini (2004); Dahl                   |

|  |                     |                                                                                                      |                                                     |
|--|---------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
|  |                     | knowledge exchange.                                                                                  | & Pedersen (2004)                                   |
|  | Innovation Networks | Collaboration among firms, universities, and research institutions enhances technological upgrading. | Feldman & Francis (2004); Eisingerich et al. (2010) |
|  | Government Support  | Targeted cluster policies, incentives, and infrastructure investments stimulate cluster development. | Altenburg & Meyer-Stamer (1999); UNIDO (2020)       |
|  | Social Capital      | Trust-based relationships and shared norms promote cooperation and collective efficiency.            | Martin et al. (2020); Thomas & Gupta (2021)         |
|  | Digital Platforms   | Platform-based coordination and data-driven collaboration improve efficiency and global linkages.    | Kenney & Zysman (2016); Nambisan (2017)             |

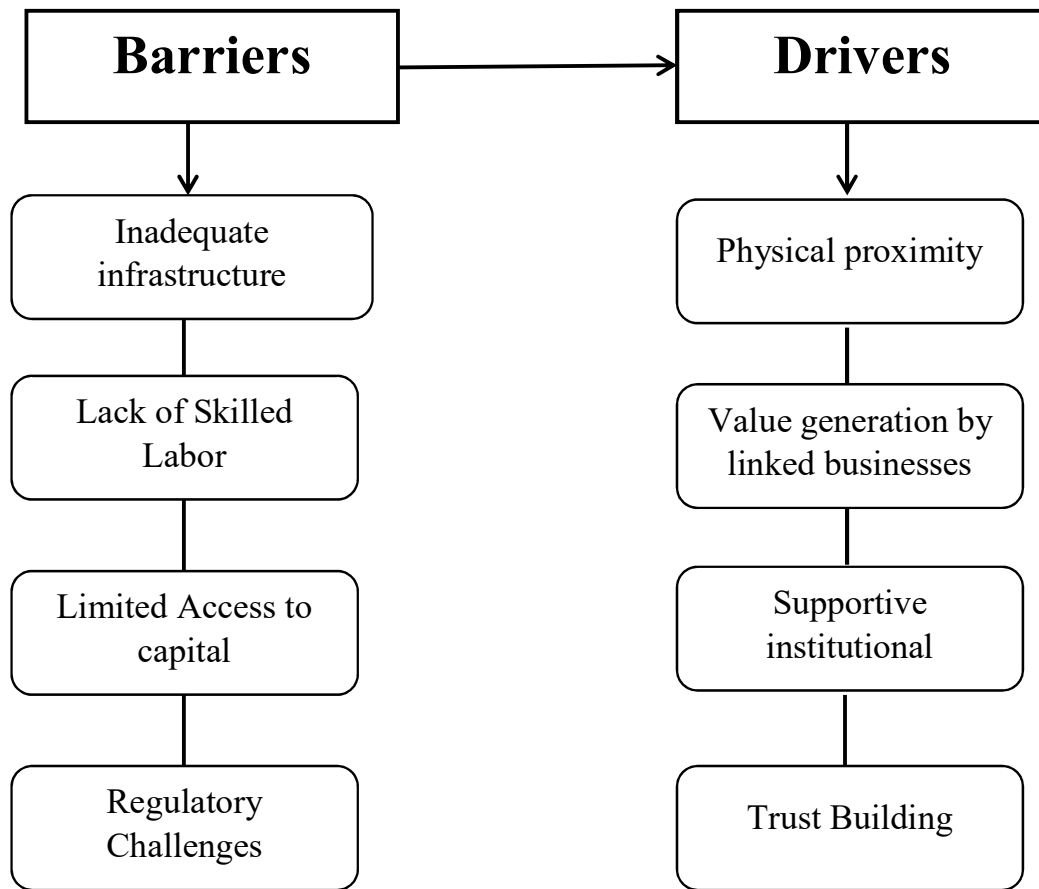
The main obstacles facing the Russian clusters were timely federal government funding, a free-market approach to their establishment and expansion, better infrastructure negotiations with investors, and the adoption of appropriate regulations that can attract both foreign and domestic capital and promote economic growth (Sosnovskikh, 2017). The barrier for the Aerospace tooling cluster in Australia lack of trust between the firms, while changing supply chains, information sharing, government policy and intervention, location, and increased global competition acted as a driver for the cluster (Hall, 2012). In a nationwide survey of Poland, the barriers to open innovation in clusters are found as joint project management, issues of intellectual property rights, fear of losing control, and unwillingness to delegate essential employees (McPhillips, 2020).

The study of 20 clusters dispersed widely across India suggests a historical background, the existence of one or a few large enterprises, regional government policy, the pooled labour market of skilled workers, entrepreneurial spirit, and accessibility of raw materials are the drivers responsible for the development of clusters (Rawat et al., 2017). Similarly, research suggests that physical proximity, knowledge sharing, innovations, government support involvement, common vision, and economic and environmental factors are the drivers for the development of the industrial clusters (Janipour et al., 2022).

The rural artisan and craft-based clusters in India are facing multiple barriers, including locational attributes, infrastructure, raw material shortage, low demand, and absence of an institutional support system for marketing, skill development, and technology upgradation (Das, 2015). Literature suggests that due to enhanced market access, the Sualkuchi handloom cluster in Assam can cater to the demands of the national and international market but faces barriers of rising prices of raw materials, unavailability of raw materials, and labor shortages in recent years, and further needs to upgrade its technology to cater to higher markets and government intervention is required to improve the conditions further (Hazarika, 2020).

Based on the research on handicraft clusters in Egypt Mohamed (2022) summarised the barriers as an absence of coordination between development organizations, a lack of business models and skills, raw material shortage, and labor issues. The author suggests the establishment of an institutional setup for the management and development of the cluster, data and statistics management system, improvements in design and innovation, raw material management system, skill development, and marketing promotion to strengthen the development of clusters.

Different governments and policymakers across the globe implement various policies to promote cluster-based development strategies and the implementation for economic growth varies from country to country and region to region. The more technologically advanced countries - France, Italy, Canada, Japan, China go for competitiveness, permeation of overseas markets, and uniqueness, while developing countries like India cluster approach is for – rural economic development through increment in artisan wages, employment generation, skill and knowledge enhancement, market development etc. The cluster approach can help increase the viability of sanctioned projects by providing requisite infrastructure, credit facility, information, and other allied support services at lower costs to provide the required employment in NE part of India (NEC, 2015). <Table 9> represents the major barriers and drivers to cluster development.



**Figure 2: Major barrier & drivers to cluster development**

Though Figure 2 illustrates graphically drivers arising out of barriers, conceptually there is a difference between barriers and drivers. Barriers are the inhibiting factors that prevent the development of a cluster, and drivers are facilitating factors that increase growth and competitiveness. Their coincidence in the model indicates interaction instead of hierarchical dependence, drivers are not created by barriers but are interested in or react to them in the development ecosystem.

## 5.2 Future Research Directions

Research on some of the new themes of the industrial clusters is still in its infancy, and this research identified some of the opportunities for future research along with the research question <Table 10>. This evaluation demonstrates that there is still a great deal of room for theoretical and practical applied cluster development research to grow. The specific future study on the dynamics of artisan clusters might yield valuable insights for stakeholders at all levels, aid in developing tailored government programs, and improve the policy-making process. These clusters are critical to local economies, particularly in developing countries, and play a significant role in preserving cultural and historical heritage and promoting sustainable development. Collaborative studies with academic institutions, government agencies, non-government organizations, financial institutions, and industry bodies could provide the much-needed data and frameworks to support and strengthen these clusters to increase artisan socio-economic conditions and subsequent employment generation.

### I. Cluster Governance and Institutional Support

The success of cluster-based economic development policies, activities, and practices is not well documented, even though many people support these kinds of policies, and the understanding of clusters and their role in economic performance has grown over time (Martin & Sunley, 2003). Literature shows evidence that policy-driven clusters sometimes fail (Manning, 2008; Tambunan, 2005) because governments and local authorities often undervalue the significance of self-driven business firms in the preliminary stage of the cluster development process (Manning, 2008). Shin & Hassink (2011) indicated that the public sector can play an important role in facilitating cluster emergence by developing

infrastructure, public R & D institutes, and improving local conditions, therefore, these administrations seek to expand the regional economy as a whole (Jia et al., 2017). Zhang & Hu (2014) provides evidence through a detailed case study of how local government intervention at different stages of the process facilitated the growth and emergence of a potato cluster sector. Studies comparing developed and developing economies can show how governance models change to accommodate institutional realities unique to a given framework.

## II. Institutional Dynamics and Market Access

The studies of rural clusters demonstrate that current institutions are deficient in terms of coordination, progressive vision, and an understanding of the setting in which these clusters operate. Berthinier-Poncet, 2014 emphasized the need for mutual trust and cooperation for the governance of a cluster. Improved market access may be made possible by strong institutional support, which makes it possible to create infrastructure, increase skills, get funding, and improve the quality of products. The contemporary research focuses on what kinds of policy interventions the government must make, but not on which level of government should design and execute them (Ketels, 2013). Artisan-based clusters may become robust engines of inclusive prosperity by integrating rural areas into national and international markets and bolstering institutional capacity.

## III. Social Inclusiveness and Resilience of Clusters

Particularly in the context of emerging economies and rural artisan-based clusters, social inclusivity and resilience have become important aspects of cluster development research. Kimura (2011) has shown that with the help of familial ties and social embeddedness handicraft clusters in Vietnam have improved in technology diffusion, skill development, and global marketing links. Over time, there will be more opportunities for the local communities to flourish as a result of an increased awareness of the resources and abilities within the community (Torri, 2010). Ooms & Ebbekink (2018) suggested in the study of three Dutch clusters that the policies were not only made to encourage cognitive, social, and geographical proximity but also personal closeness. Network analytics and relational capital theory could be combined in future studies to investigate how shared norms, trust, and reciprocity influence resilience. It is still unclear how formal institutional mechanisms and unofficial social relationships interact. Policymakers and practitioners may create resilient and inclusive cluster interventions by using research in this area as a guide.

## IV. Innovation and Knowledge Spillover

The crucial challenge for economic development is whether and how attempts to improve the efficiency of cluster networks can promote knowledge spillovers (Wolman & Hincapie, 2010). Finding better ways to supplement artisanal knowledge and abilities with formal education and outside expertise when the skilled artisans fall short is the main problem facing the Metro Cebu furniture cluster, which will then need to build a product for the global market (Beerepoot, 2015). In the context of knowledge transfer, cluster research emphasized the value of unofficial social ties, such as those with family members (Morosini, 2004) which helps in the transmission of knowledge from one generation to another (Dias et al., 2020). Future studies could evaluate regional absorptive ecosystems and firm-level learning strategies that support technology advancement. Thus, there is a need for a better understanding of the obstacles to knowledge sharing and stakeholder alignment on the ground, especially concerning SMEs as the clusters' primary driver of growth and job creation (Jaegersberg & Ure, 2011).

**Table 10: Summary of sub-themes and proposed research agenda**

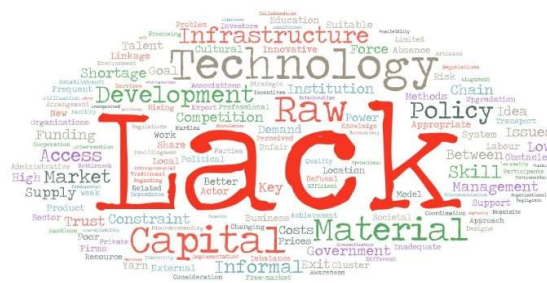
| Sr. No | Theme                                        | Sub-Theme        | Suggested research questions                                                                                                |
|--------|----------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 1      | Cluster Governance and Institutional Support | Cluster Strategy | How can artisan clusters preserve cultural heritage while adopting modern business technologies and practices?              |
|        |                                              |                  | How can artisan clusters be integrated with tourism to enhance livelihoods and promote local products?                      |
|        |                                              | Governance       | How do various governance models—such as PPPs, cooperatives, and regional networks—support sustainable cluster development? |

|   |                                                 |                     |                                                                                                                                                           |
|---|-------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                 |                     | What specific roles do governments, NGOs, SHGs, and community organizations play in strengthening institutional support for clusters?                     |
|   |                                                 | Cluster Policy      | How can governments promote inter-cluster collaboration and knowledge sharing to improve sustainability in low-technology clusters?                       |
|   |                                                 |                     | How should policies be designed to formalize artisan and small-producer clusters in underdeveloped regions?                                               |
| 2 | Institutional Dynamics and Market Access        | Market Segments     | How can digital platforms, trade fairs, and e-commerce improve market access, production, and distribution for artisans in low-technology clusters?       |
|   |                                                 | Cluster Ecosystem   | How do collaborations among government agencies, industries, universities, research institutions, and rural clusters enhance innovation and productivity? |
| 3 | Social Inclusiveness and Resilience of Clusters | Community           | What trust-building strategies are most effective for strengthening relationships within rural and artisan-based clusters?                                |
|   |                                                 |                     | How does community participation in governance influence cluster performance and long-term sustainability?                                                |
|   |                                                 | Risk Management     | How can governments design resilience-focused policies to help clusters withstand external shocks while maintaining sustainability goals?                 |
| 4 | Innovation and Knowledge Spillover              | Cluster Innovation  | How does frugal innovation contribute to the sustainability and competitiveness of clusters in developing regions?                                        |
|   |                                                 |                     | How do traditional knowledge and indigenous practices support innovation in artisan-based clusters?                                                       |
|   |                                                 | Knowledge           | How can clusters integrate modern technologies with traditional knowledge to drive sustainable development?                                               |
|   |                                                 |                     | What barriers hinder effective knowledge transfer within clusters, and what factors influence this process?                                               |
|   |                                                 | Skill development   | What challenges limit skill development in rural and artisan communities, and what strategies can address them?                                           |
|   |                                                 |                     | How can modern skill trends, product diversification, and quality enhancement drive innovation in artisan-based clusters?                                 |
|   |                                                 | Technology Adaption | How can modern technologies be integrated into existing artisan processes to enhance efficiency while preserving craftsmanship?                           |

## 6. Conclusion

The literature survey depicts that the clusters are still scattered over various fields and themes. Researchers and policy-makers have emphasized the creation and growth of industrial clusters, and the advantages of doing so are well acknowledged. In this context, we conducted a thorough literature analysis using the PRISMA frameworks, examined several publications in the field of cluster research, and represented the key findings to offer a better knowledge of the present status of the discipline by highlighting major barriers and drivers of the cluster development and emergent themes in the literature. The direction for future research offered by this study will serve as a road map for researchers in this stream. Although the literature on cluster development has increased, this work is the first to comprehensively examine the major barriers and drivers, and adding to earlier assessments while making a methodological contribution.

The main impediments to cluster development are limited access to capital, lack of technology, raw materials, infrastructure complications, policy implementation issues, skill development, and an accessible market. However, these barriers differ significantly between developed and developing countries due to variations in their infrastructure, governance, market control, policy execution, dynamics, and socioeconomic factors. The policy interventions for the solutions to these barriers will be diverse in different countries.



The main drivers to cluster development are geographic closeness, value creation by interconnected companies, government support for the business climate, establishing trust, foreign direct investment and knowledge sharing and innovations. Research findings show that cluster-related literature has mostly concentrated within the academic fields relating to geography, urban studies, and regional development (González-torres et al., 2020) and urban planning, while scarcity of studies being conducted in business and management, and development disciplines (Bloom et al., 2020 ). Generally, rather than focusing on forming new clusters, the bulk of cluster programs and efforts aim to increase the competitiveness of already-existing clusters (Ketels, 2013).

In addition to the conceptual, empirical and thematic understanding coming out of this review, the paper also highlights the need to be much more integrated and future ready in the way clusters should be developed. As global value chains become increasingly digitized and interconnected, the boundaries between traditional, technology-driven, and artisan-based clusters are beginning to blur, creating new opportunities for hybrid models of production, innovation, and market participation (Fernandez-Escobedo, 2023). This convergence demands a shift from static cluster policies toward adaptive, capability-building interventions that strengthen institutional coordination, enhance digital readiness, and encourage inclusive participation from marginalized and informal-sector producers (Das, 2015; Mohamed, 2022). By bridging resource gaps, fostering resilient governance mechanisms, and leveraging both physical proximity and digital networks, policymakers and stakeholders can build clusters that are not only economically competitive but also socially embedded and culturally sustainable (Giuliani, 2013; Kimura, 2011). This expanded vision positions cluster development as a vital strategy for achieving balanced regional growth and inclusive socioeconomic transformation across diverse economic contexts (Guo et al., 2022; Paraušić et al., 2017).

The traditional cluster sector faced difficulties with operations and worries about the viability and sustainability of initiatives in the absence of funding from subsidies, guarantees, or combined corporate social responsibility mechanisms (Pachouri & Sharma, 2016). Scholars have paid little attention to artisan-based clusters due to their informality, cultural orientation, modest economic scale, data accessibility, and research funding. However, this gap offers a significant opportunity for future research given the increased interest in inclusive growth, cultural industries, and sustainable development, especially in developing countries. Millions of individuals rely on the informal sector as their primary source of employment and income in developing nations (Okeke-uzodike & Subban, 2019) consequently, cluster development is crucial for developing economies and new markets (Paraušić et al., 2017).

### ➤ Managerial Implications

Our contribution from a managerial perspective is twofold. Firstly, we suggested a comprehensive categorization of the potential facilitators for effective cluster growth. Secondly, we determine and categorize the elements that should be reduced (i.e., obstacles or barriers) to successfully develop clusters. This study will contribute to the body of knowledge already available on cluster development, ultimately aiding in the identification of facilitators and barriers and might give practitioners and policymakers fresh perspectives on cluster development and the need for the development of the traditional cluster for the increment in the income of traditional artisans and subsequent employment generation in the rural areas of developing countries. The results of this study can serve as a valuable guide for enhancing the methodical approach of research on cluster development.

### ➤ Limitations

There are several limitations to our research. Even though we conducted a thorough assessment, we only methodically looked through peer-reviewed works that were published in prestigious publications or databases, utilizing selective search string keywords, and the search was limited to English language publications only. Therefore, it's likely that we overlooked sensible observations and relevant studies about cluster development made by others and indexed in other languages. Future studies can therefore broaden the scope by choosing new search terms, inclusion and exclusion criteria, and a different database, and in different languages. Finally, due to the broad scope of the cluster development topic itself and the limitations of search tactics by utilizing specific themes, this study does not fully handle all potential discussions regarding cluster growth, as was previously noted.

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