

Entrepreneurial Ecosystems: A Systematic Literature Review and Bibliometric Analysis Using PRISMA Framework

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Abstract. This systematic review examines the altered mechanism of the Entrepreneurial Ecosystems with the help of PRISMA framework and AI enhanced bibliometric analysis to give a methodologically accurate and comprehensive combination of the state of the research. An exhaustive analysis of 486 articles, obtained from widely used academic publications and from articles that met given inclusion criteria was conducted to investigate the complex aspects of, principle actors, and active exchange that define entrepreneurial ecosystems in various parts of the world. Organizational support, a financial approachable, innovation infrastructure and social capital are influential in promoting resilience and high performing entrepreneurial ecosystems according to the study. Law, culture and technology should be emphasized in the research as vital force in facilitating continuous entrepreneurial development. The impact of such results is really meaningful, and they can add key information for academics, politicians, and ecosystem development practitioners within an effort to develop and maintain resilient entrepreneurial systems. By using the contemporary bibliometric methods and the systematic review approaches, this research integrates two research approaches to conduct a comprehensive evidence-based review concerning the entrepreneurial ecosystem and identify research opportunities for the future.

Keywords: PRISMA, AI-based bibliometric analysis, Entrepreneurial Ecosystems, Innovation, Institutional Support, Systematic Literature Review, Entrepreneurial Growth.

1 Introduction

Entrepreneurial Ecosystems (EE)s is a concept that has developed as critical framework to understand the socio-economic environments that foster entrepreneurship and innovation. Definition of entrepreneurial ecosystem is an interlinked group of participants and components including entrepreneurs, investors, educational institutions, incubators, governmental policies, cultural norms and technological infrastructure which collectively support the startup, growth and sustainability of entrepreneurial endeavors.

The Ecosystem approach differs from previous models focusing exclusively on the individual entrepreneurs or the market; it emphasizes the systemic features of entrepreneurship, emphasizing the systemic nature of entrepreneurship: cooperation, co-evolution and the local

dynamics that promote entrepreneurial success. In the current rapidly moving innovation-based economy of the world, the entrepreneurial ecosystems are recognized as vital stakeholders to the economic development, the regional competitiveness and job creation. Governments, academic and corporate bodies are investing a lot of resources in trying to understand and improve these ecosystems. The increasing amount of literature on topics in management, economics, regional studies, and public policy creates the problem of synthesizing results and establishing the framework. Although entrepreneurial ecosystems are theoretically and practically important, the existing research does not necessarily have a common analytical frame and shows high diversity in conceptualizations, research designs, and geographical focus. As such, there is an urgent need for a systematic and panoramic view of the existing research landscape in the field, what key issues have been engaged and what have been the key contributions and issues yet to be addressed. This study closes the gap to conduct the research by conducting a SLR and an AI driven bibliometric analysis following the PRISMA protocol. This study investigates 486 scholarly articles in peer reviewed journals to provide a systematic review of the development of entrepreneurial ecosystem literature to define trends in academic collaborations as well as citations and to make strategic recommendations for future research and policy formulation. The findings of this research are expected to significantly contribute to academic dialogue and provide practical insights for ecosystem developers, policymakers, and educators committed to advancing entrepreneurship across diverse socio-economic environments.

1.1 Key Components of Entrepreneurial Ecosystems

1.1.1 Actors and Agents

Entrepreneurial ecosystems are driven by a range of actors. Entrepreneurs and startups are central to these systems, serving as the key agents of innovation and enterprise creation [1] [5]. Government institutions influence the ecosystem by establishing supportive policies, offering funding mechanisms, and fostering an enabling environment [1] [9]. Universities and research institutions contribute significantly through innovation, research, and by supplying skilled human capital [5][9]. Additionally, financial intermediaries such as venture capitalists, angel investors, and banks provide critical funding for entrepreneurial ventures [5] [6].

1.1.2 Support Structures

Supportive institutional frameworks are also essential. Incubators and accelerators help in refining business models, offering mentorship, and facilitating networking opportunities [2][9]. Furthermore, professional services including legal, accounting, and consulting firms—aid in ensuring operational efficiency and regulatory compliance [7].

1.1.3 Cultural and Social Context

A robust cultural and social setting reinforces the ecosystem. Effective networking among stakeholders enhances information flow and resource mobilization [8] [12]. Moreover, cultural attitudes that celebrate entrepreneurship and accept failure contribute to the proliferation of startups [13].

1.2 Objectives and relevance of the study

The aims of the study are to use PRISMA guidelines and AI-based bibliometric analysis to carry out systematic review of literature on entrepreneurial ecosystems that exist. This entails a process of their identification of key components, trends, and influential factors that define the development and performance of such ecosystems. The study will look into how such elements as institutional support, finance, innovation, policy among others combine to promote entrepreneurial growth. The relevance of this research is enhanced by a rising global interest in entrepreneurship as a source of economic development. By examining 486 chose articles, the research gives a thorough insight into the structure, dynamics and future path of entrepreneurial ecosystems.

2 Literature Review

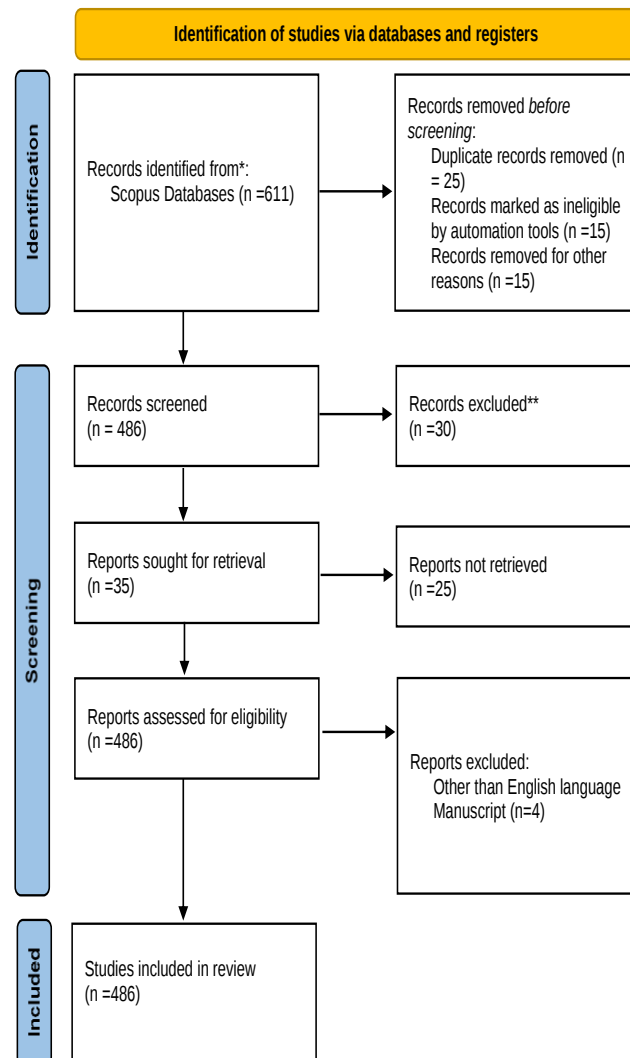
The study provided a systematic analysis of the intricate structure and impact by the entrepreneurial ecosystems in different geographical, cultural, and economic environments. Using a synthesis of 486 scholarly articles, the approach identifies key ecosystem components, interrelationships and consequences on entrepreneurial success, innovation, and economic resilience. Empirical findings confirm the fact that entrepreneurial ecosystems are made up of many related pillars such as human capital, financial capital, markets, policy, support systems and culture [1]. The theoretical foundations developed by Isenberg [2] and Stam [3] have set the direction for researchers in identifying and duplicating ecological frameworks worldwide. Studying portraits, the vital role that governmental policies play in the development of entrepreneurial ecosystems through incentives, financing of start-ups as well as regulatory support [4]. Venture money, angel investors and exposure to crowdfunding significantly enhances company scalability and innovation. The entrepreneurial culture, shaped by social values, risk tolerance and success images that are very much part of the cultural context, encourages the identification of opportunity as well as the desire for entrepreneurial activity, which means the emergence of new businesses. Knowledge spillovers, research commercialization, and talent cultivation are all methods by which academic institutions participate [7]. The roles played by business incubators and accelerators in mentorship, networking and resource provision of early-stage businesses are well documented [8]. Research on regional cluster growth and localized innovation centers in territories of Europe, Asia, and Latin America reveals varied degrees of success dependent on cooperation and governance frameworks [9, 10]. The research demonstrates the diverse evolution of entrepreneurial ecosystems in developing and grown nations with regard to infrastructure, size of market, and institutional maturity [11, 12]. Triple Helix and Quadruple Helix frameworks are frequently applied to analyze this interdependence of academics, business, government and civil society [13, 14]. Active research in recent years applies the bibliometric analysis to delimit intellectual structure and topic evolution, revealing surge in transdisciplinary and multinational collaborations post-2010 [15, 16]. Digital transformation and Industry 4.0 are presented as leverage for the reinvention of traditional entrepreneurial ecosystems through virtual entrepreneurship and platform mediums [17]. Diversity and inclusive policies are increasingly becoming critical in ecosystem health whereby data has shown that different ecosystems offer more resilient and sustainable enterprises [18]. Social and environmental entrepreneurship are gaining momentum, putting entrepreneurial ecosystems as tools of sustainable development [19, 20]. Crisis-focused literature, particularly during the period of the COVID-19 epidemic, focuses on the importance of flexible, resilient ecosystems capable of establishing the recovery and

strength of entrepreneurship [21]. Longitudinal studies show that ecosystem maturity is a continuously learning and iteratively policy aligned process. [22]. Various studies support the call to bring-bottom up (entrepreneur-led) and top-down (policy-driven) approaches in ecosystem governance for successful ecosystem governance [23]. Their enormous value for empowering the global entrepreneurial ecosystems through diaspora networks and cross-border linkages is widely acknowledged [24]. It is investigated whether rural and non-urban entrepreneurial ecosystems have the potential to decentralized innovation and moderate regional inequalities [25]. Exchange of knowledge and innovation flow in ecosystems are supported by official channels (conferences, publications) and non-formal ones (networking events, meetings) [26]. A network-based theory is applied to gain insight into the effects of trust, reputation and social capital on cooperation and entrepreneurial outcomes [27]. Findings reveal that metrics / indicators are indeed key in determining the success of ecosystems, past headcount of a company or money raised [28]. Studies encourage creation of learning-oriented environments where experiments are encouraged and failure is tolerated with constant improvement [29]. At the end of the day, researchers push for context-specific ecosystem models that are tailored to suit the situation of the locality, shying off the generic solutions and encouraging indigenous entrepreneurship [30].

3 Methodology

This study is derived from a comprehensive examination of the literature on "Entrepreneurial Ecosystems," using the Scopus database and according to the PRISMA 2020 principles (Figure 1). A three-step process was implemented to guarantee the incorporation of the most relevant and high-caliber research articles. In step 1, a record identification was conducted by an extensive search of the Scopus database, yielding 611 results. Screening was conducted in phase 2. Ninety book chapters and thirty-five conference papers were removed for failing to fulfill the inclusion criteria centered on journal articles. This decreased the count of qualifying papers to 486 for comprehensive evaluation. In stage 3, after the evaluation of the remaining documents for relevance and redundancy, all 486 journal articles were deemed legitimate and included in the final research for systematic review and bibliometric analysis. The chosen materials include the timeframe from 2012 to 2025, sourced from 270 sources. The dataset indicates a robust yearly growth rate of 34.02%, accompanied by an average document age of 3.35 years. The papers have garnered an average of 21.61 citations per article, resulting in a cumulative total of 36,115 references. A total of 1040 Keywords plus (ID) and 1718 authors ' keywords (DE) were discovered, demonstrating extensive theme coverage. The authorship pattern comprises 1414 writers, with 91 single-authored papers and an average of 2.82 co-authors each work. International cooperation is substantial, with 32.57% of co-authorships occurring internationally, demonstrating the worldwide reach of research in this field. The retrieved data underwent bibliometric analysis using the Biblioshiny interface in R Studio, enabling the mapping of publishing trends, keyword clusters, citation networks, and collaboration patterns. This analytical approach guarantees a clear, thorough, and reproducible examination of the academic environment regarding entrepreneurial ecosystems.

PRISMA 2020 flow diagram for new systematic reviews, which included searches of databases Fig 1.



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

Fig.1. PRISMA technique for inclusion of research articles [486].

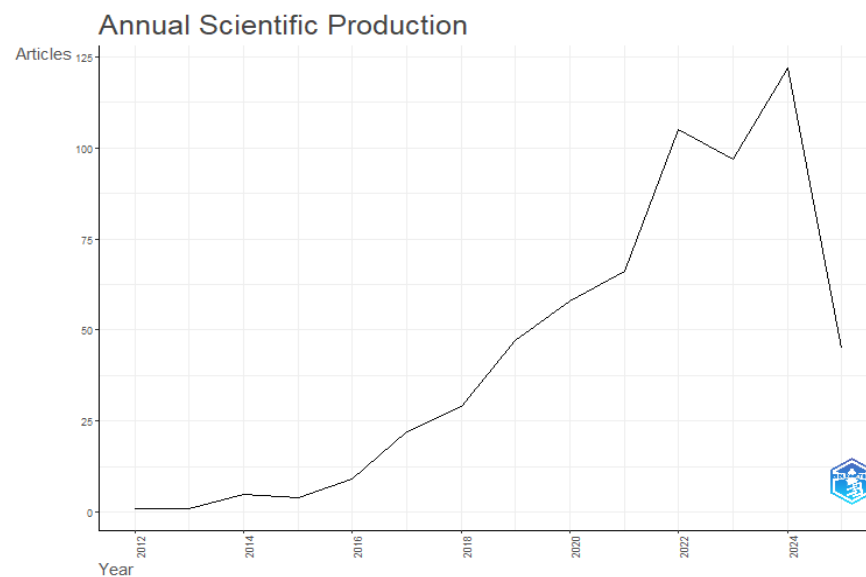


Fig.2. Trend of Annual Scientific Article Production (2012–2024).

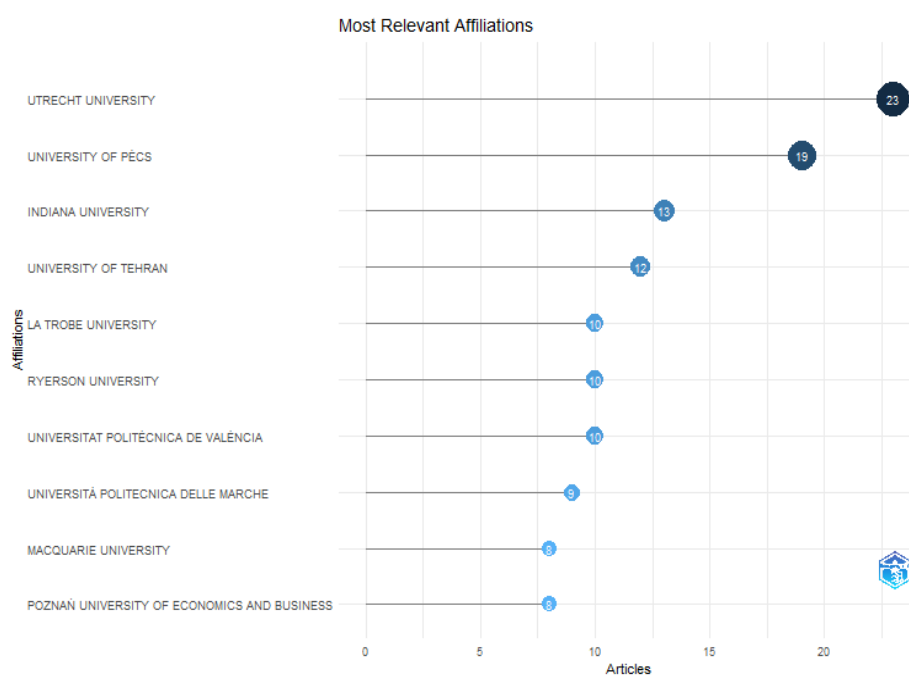


Fig.3. Most relevant affiliations.

The oscillations may signify the differing levels of interest in the subject under examination. Fig 2 and 3 illustrates the annual variation in the quantity of articles about the terms 'ecosystems', 'entrepreneurial ecosystem', and 'entrepreneur'. The area of scientific study in question does not tend consistent expand. The influential variables may include the dynamic characteristics of entrepreneurship research, the development of the entrepreneurial ecosystem idea, or the changing emphasis of researchers on developing domains in management and innovation. These variances may also be influenced by changes in governmental funding objectives and the use of multidisciplinary methodologies in entrepreneurship research.

4 Results and Discussions

It is quite helpful to analyze the affiliations contributing to the literature on entrepreneurial ecosystems. The affiliations that contributed to this field are listed in Fig2. Among these, Utrecht University leads with 23 articles, indicating a consistent and strong research focus on entrepreneurial ecosystems. The University of Pécs follows with 19 contributions, while Indiana University and the University of Tehran show notable engagement with 13 and 12 articles, respectively. Other prominent contributors include La Trobe University, Ryerson University, and Universitat Politècnica de València, each with 10 publications. This highlights a diversified global interest across institutions, reflecting both geographic and disciplinary variety. The spread may also suggest collaborations or regional strengths in entrepreneurship research.

The map in Fig 2 displays the geographical distribution of scientific output in this domain. As can be observed, the *United Kingdom* dominates with a substantial 3,348 publications, reflecting a concentrated and mature research ecosystem. The USA and Italy follow with 1,767 and 1,337 contributions, respectively. Countries such as Germany, China, and France also show strong engagement, while Sweden stands out with a remarkable intensity score of 96.8 despite fewer publications. This metric could imply a focused scholarly interest or high-quality output relative to volume. In contrast, Australia and the Netherlands reflect moderate contributions both in terms of volume and intensity.

This distribution pattern may be attributed to several factors such as regional academic infrastructure, availability of research funding, policy focus on entrepreneurship, and the maturity of startup ecosystems in respective countries. For instance, the UK's leading position might reflect its robust entrepreneurial support systems and well-established academic networks around innovation and entrepreneurship. Similarly, universities from varied continents reflect the increasing globalization and academic collaboration in entrepreneurship studies.

Country Scientific Production

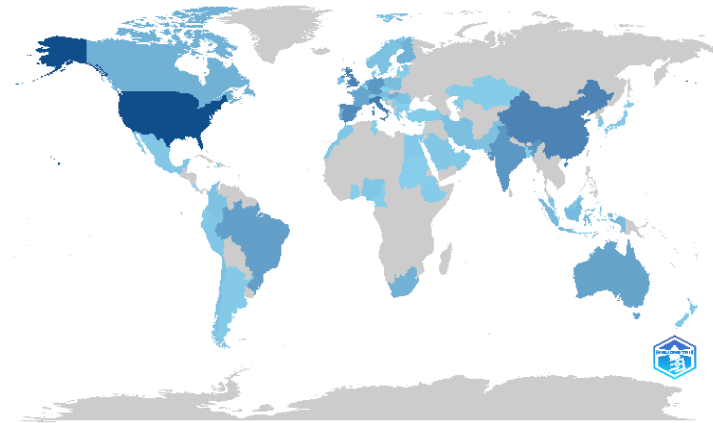


Fig.4. Global Distribution of Scientific Publications by Country.

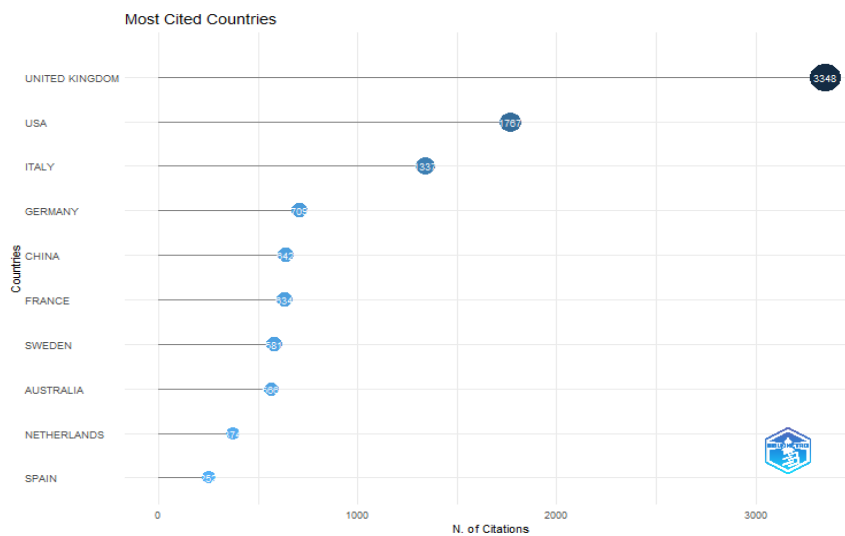


Fig.5. Most Cited Countries in Scientific Publications.

Fig 4 and 5 and the accompanying table illustrate the total number of publications and the average citations per article for nations contributing to the literature on entrepreneurial ecosystems. The United Kingdom ranks first with 3,348 articles and the greatest average citations of 98.5, signifying substantial academic influence. Sweden has a notable average citation rate of 96.8, despite a lower volume of publications, indicating superior quality of production. Conversely, the USA, Italy, and France have intermediate citation averages, but

nations such as China, Germany, and Australia show lower averages, indicating either more recent research or less exposure.



Fig.6. Word Cloud.

The word cloud in Fig 6 highlights key terms in the literature on *Entrepreneurial Ecosystems*. The most frequent are “ecosystems” (89), “entrepreneurial ecosystem” (81), and “entrepreneur” (55), showing the strong focus on core concepts. Other common terms like “innovation,” “entrepreneurship,” and “regional development” reflect the interdisciplinary nature of the field. Terms such as “sustainable development,” “public policy,” and “social entrepreneurship” point to broader societal and policy interests. The presence of “education,” “technology transfer,” and “case studies” suggests growing academic engagement. Overall, the analysis shows a diverse and evolving research landscape in entrepreneurial ecosystems.

4.1 Challenges and Measurement

Notwithstanding their significance, entrepreneurial ecosystems have difficulties in conceptual clarity and assessment. A lack of widespread consensus on the concept or paradigm for assessing EEs complicates thorough evaluation. Ecosystems are strongly context-dependent, exhibiting considerable variation between geographies regarding resources, participants, and maturity [1] [3].

4.2 Policy Implications

From a policy standpoint, customized interventions are crucial. Policymakers must design plans that correspond to the specific qualities and difficulties of the local environment. [1] [3]. Furthermore, fostering inclusivity by advocating for women, minorities, and underrepresented groups is essential for the comprehensive development of entrepreneurial ecosystems [11] [12].

4.3 Future Directions

The emergence of digital technology is transforming conventional ecosystems. The emergence of digital entrepreneurs necessitates novel types of support and regulation. Moreover, there is an increasing emphasis on sustainability, necessitating that ecosystems maintain resilience to disturbances and adapt to market dynamics [4] [9].

5 Conclusions

Entrepreneurial ecosystems are the fundamental for innovation-based economic growth. Understand their structure, correct measure limitations, and enforce context-specific regulations are critical towards the development of the ecosystem. Towards ecosystem digital integration and sustainability, consistent research and supportive policies will be critical in facilitating entrepreneurial vigour [10]. The research in a systematic review of entrepreneurial ecosystems based on the PRISMA framework highlights the dynamic interplay between the basic tenets of entrepreneurial theories and the complex complexities of modern business settings. This work considered a wide range of academic contributions, from a study of the structural-institution-cultural facets of entrepreneurial ecosystems and their consequences for innovation, start-up growth, regional development. The results of this research show that there is relatively a cooperative nature of the notion of entrepreneurs' ecosystems as cooperative nature, access to resources, assistance from the government, and building human capital that underlies the notion. This research integrates information in order to improve understanding of the operation and evolution of entrepreneurial ecosystems in different situations. Yet, it does not make full use of research potential of the area; therefore, there has to be a rush for further empirical and conceptual research to establish link between growing trends and contextual variance that affect entrepreneurial environment.

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