

The Role of Innovation in Shaping Entrepreneurial Ecosystems in the Indian Economy

Dr. Asheesh Kumar¹, Prof. S. K. Rastogi²

¹Assistance Teacher, Basic Education Department, Moradabad

²Faculty of Commerce, Hindu College, Moradabad, Affiliated to Guru Jambheshwar University, Moradabad

Abstract:

India has rapidly emerged as the world's third-largest startup ecosystem, hosting over 157,000 recognized startups and more than 100 unicorns by 2024, signalling a decisive shift in its economic landscape from factor-driven to innovation-driven growth. This paper critically examines the role of innovation in shaping India's entrepreneurial ecosystem by analysing sectoral trends, geographic distribution, policy frameworks, and demographic contributions. Drawing on secondary data from government reports, industry surveys, and empirical studies, the research investigates how innovation interacts with enabling institutions, venture capital, incubator networks, and cultural dynamics to foster entrepreneurial growth. The study identifies that government initiatives such as the Startup India program and state-level innovation policies have been pivotal in reducing entry barriers, enhancing funding access, and democratizing entrepreneurship. Ultimately, the findings confirm that innovation is not merely an outcome but the central driver of India's entrepreneurial ecosystem. It enables startups to address grassroots challenges, scale globally competitive solutions, and contribute to long-term economic resilience. The study concludes that sustaining this momentum requires holistic ecosystem strengthening through continuous policy adaptation, collaborative stakeholder engagement, and longitudinal evaluation of ecosystem impacts. Future research should focus on longitudinal data collection, regional cluster dynamics, and interventions to enhance inclusivity and innovation diffusion in underrepresented geographies.

Keywords: Entrepreneurship; Innovation; Startup; Digital Infrastructure; and Startup Ecosystem in India

Introduction

India has emerged as the third-largest startup ecosystem in the world, hosting over 157,000 recognized startups as of mid-2024, including more than 100 unicorns. The rapid rise of these entrepreneurial ventures marks a dramatic shift in the Indian economy, turning it from a largely factor-driven landscape to one deeply shaped by innovation, entrepreneurship, and knowledge spillover. Government policies such as the Startup India initiative, improvements in digital infrastructure, and a vibrant demographic dividend have contributed substantially to this transformation. Innovation now serves as a primary engine for job creation, technological advancement, and economic growth, while also enabling India to address grassroots challenges and compete globally.

This paper provides a comprehensive review of how innovation has shaped entrepreneurial ecosystems across India, examining key policies, sectoral trends, regional clusters, and the challenges faced by startups. Real-world data and empirical analyses are deployed to investigate the dynamic interrelations among government support, funding landscapes, incubator and accelerator networks, and the evolving culture of entrepreneurship.

Review of Literature

India's entrepreneurial transformation is underpinned by extensive research analyzing the mechanisms, challenges, and policy frameworks that define the country's innovation-led ecosystem. The literature encompasses theoretical models—such as cluster theory, knowledge spillover theory of entrepreneurship (KSTE), stakeholder theory, and systems theory—as well as empirical studies on the impact of digital infrastructure, education, venture capital, and government incentives.

Key Insights from Recent Literature:

Stam and Spigel (2018) aimed to develop an integrative framework for understanding entrepreneurial ecosystems as systems of interdependent actors and factors that enable productive entrepreneurship. They developed standardized indicators and used statistical analysis to examine relationships between ecosystem quality and entrepreneurial outputs in 12 Dutch regions. The study found strong interrelationships among ecosystem elements, confirming the systemic nature of entrepreneurial ecosystems and demonstrating that ecosystem quality is strongly correlated with entrepreneurial outputs, particularly high-growth firm prevalence.

Wurth, Stam, and Spigel (2023) extended this foundation by focusing specifically on the mechanisms through which entrepreneurial ecosystems operate, seeking to understand the causal relationships and feedback loops that drive ecosystem performance. They utilized a mechanisms-based approach, employing systematic literature review and theoretical synthesis to identify and categorize the specific mechanisms through which entrepreneurial ecosystems operate. The results highlighted the importance of understanding not just what elements exist in an ecosystem, but how they interact dynamically to produce entrepreneurial outcomes.

Jones and Ratten (2021) concentrated on university entrepreneurial ecosystems and knowledge spillover effects, aiming to understand how academic institutions contribute to entrepreneurial activity through knowledge transfer and innovation diffusion. Their methodology emphasized qualitative analysis of knowledge transfer processes and quantitative measurement of spillover effects. The study demonstrated that universities play a crucial role in entrepreneurial ecosystems through knowledge spillovers, with research institutions serving as key nodes for innovation diffusion and startup creation. The study showed that the proximity of universities to entrepreneurial activity significantly enhances ecosystem performance through both direct and indirect knowledge transfer mechanisms.

The Government of India's Startup India Ecosystem Report (2024) had policy-oriented objectives, seeking to document the growth trajectory of India's startup landscape, measure employment generation, and assess the effectiveness of government initiatives in fostering entrepreneurship. Their methodology included both absolute and relative scoring systems, incorporating feedback mechanisms from startups and ecosystem participants. The reports showed significant geographic expansion beyond traditional metros, with states like Maharashtra, Karnataka, and Delhi leading in startup registrations, while also revealing growth in tier-II and tier-III cities.

KPMG's Democratisation of Entrepreneurship report (2024) analysed the transformation of India's entrepreneurial landscape toward greater inclusivity, particularly focusing on tier-II and tier-III cities, women entrepreneurs, and democratized access to capital and resources. Report utilized a mixed-methods approach combining quantitative analysis of startup data, geographic distribution patterns, and sector-wise trends with qualitative insights from industry stakeholders. Their results indicated that domestic capital flows, improved digital infrastructure, and targeted government schemes have successfully expanded entrepreneurial opportunities beyond traditional urban centres.

Bala Subrahmanya (2018) pursued a systemic and evolutionary analysis of Bangalore's IT entrepreneurial ecosystem, seeking to understand the long-term, multi-level processes that shaped the region's entrepreneurial development. The author employed a single in-depth case study design based on over 20 semi-structured interviews with key ecosystem actors, combined with historical analysis tracing Bangalore's development from post-independence through the IT boom. The results identified the crucial role of the Indian diaspora, government research institutions, and multinational enterprises in nurturing the ecosystem. However, he also identified structural constraints including infrastructure limitations and what he termed "structural heterogeneity" - a vibrant entrepreneurial core surrounded by underdeveloped systemic conditions.

Krishna, M. (2021). aimed to conduct a comprehensive book review examining the structure and components of entrepreneurial ecosystems for tech start-ups in India. The primary objectives were to understand how entrepreneurial ecosystems evolve, their structural composition, and the specific role they play in nurturing technology-based startups in the Indian context. The methodology involved detailed analysis of the book's eight chapters, examining the theoretical framework, empirical evidence, and comparative analysis between Bangalore and Hyderabad ecosystems. The study identified key interlinkages between startup lifecycle stages and ecosystem components, demonstrating how different elements become critical at various phases of startup development.

OECD (2025), report aimed to develop a standardized diagnostic tool for measuring and benchmarking entrepreneurial ecosystems globally. The methodology incorporated both quantitative indicators and qualitative assessments, utilizing data from multiple sources including government statistics, private sector reports, and international databases. The framework emphasized normalization techniques to enable fair comparisons across countries with different economic structures and development levels. The results provided a comprehensive diagnostic framework that offers policymakers sophisticated tools for measuring entrepreneurial ecosystem health and identifying specific areas for improvement. The framework successfully demonstrated variations in ecosystem performance across different dimensions, highlighting the importance of balanced development rather than focusing solely on individual metrics.

Press Information Bureau (2024) Startup India Factsheet aimed to document the remarkable growth and impact of India's startup ecosystem under the Startup India initiative. The methodology involved comprehensive data collection from multiple government sources including DPIIT registration data, state government submissions, and ecosystem participant surveys. The approach utilized both absolute and relative measurement frameworks, incorporating feedback mechanisms from startups and ecosystem stakeholders. The results demonstrated unprecedented growth with over 157,000 recognized startups creating more than 1.5 million direct jobs by 2024.

Mishra et al. (2024) examined the crucial intersection of innovation and entrepreneurship as primary drivers of sustainable economic growth in the Indian context. The research employed a mixed-methods approach combining literature review, case study analysis, and empirical examination of selected

enterprises from IT and pharmaceutical sectors. The study utilized both startup enterprises from first-time entrepreneurs and established decade-old companies to provide comprehensive insights. The findings revealed that innovation serves as one of the main drivers of long-term economic prosperity, with India's economy showing 7% average growth over the past 20 years.

Singh et al. (2019) explored the application of stakeholder theory to entrepreneurial ecosystem development, examining how the interconnected nature of ecosystem components mirrors stakeholder relationships in organizational contexts. The approach involved systematic examination of how stakeholder theory principles apply to ecosystem development, analysis of interconnected relationships between ecosystem components, and investigation of collaborative coordination mechanisms among various stakeholders including startups, large organizations, and public institutions. The findings emphasized that ignoring the interconnected nature of ecosystem components can result in negative outcomes.

Sharma (2014) aimed to identify factors acting as positive forces for innovative entrepreneurship in the Indian context while also identifying obstacles hindering the realization of India's innovative entrepreneurial potential. The methodology employed case study analysis of selected enterprises from IT and pharmaceutical sectors, combining both quantitative and qualitative approaches. The research investigated factors including background information, innovation management practices, influencing factors, and resources affecting innovative practices in SMEs. The results emphasized the need for coordinated efforts to strengthen India's innovation ecosystem through better policy integration and stakeholder collaboration.

NITI Aayog (2021) India Innovation Index aimed to create a comprehensive framework for evaluating and developing India's innovation ecosystem at the state and union territory level. The methodology employed a structured seven-pillar framework consisting of five 'Enabler' pillars (Human Capital, Investment, Knowledge Workers, Business Environment, Safety and Legal Environment) and two 'Performance' pillars (Knowledge Diffusion and Knowledge Output). The index utilized 66 indicators distributed across 16 sub-pillars, representing a significant expansion from the previous 36 indicators. The results demonstrated the scope of innovation analysis across India and contributed to the government's Global Indices for Reform and Growth (GIRG) mechanism for monitoring international competitiveness.

Startup Genome (2023) APEXE Nations aimed to develop a pioneering data-driven framework helping countries measure their startup ecosystem potential and effectiveness. The methodology employed a sophisticated three-factor framework measuring Innovation Potential, Startup Ecosystem performance, and Startup-Relevant Policy effectiveness. The methodology incorporated normalization techniques to enable fair comparisons across countries of different sizes and development levels, utilizing regression analysis and correlation studies across expanded datasets including non-G20 countries. The results identified that some highly innovative countries like Australia, Germany, and Japan underperform in startup activity relative to their potential, signalling needs for targeted policy interventions.

OECD (2025), aimed to provide standardized benchmarking capabilities for comparing entrepreneurial ecosystem performance across different countries and regions. The benchmarking tool methodology incorporated both quantitative metrics and qualitative assessments, utilizing international databases and country-specific data sources. The framework successfully demonstrated the importance of holistic ecosystem development rather than focusing on individual components in isolation.

Research Methodology

Objectives

- To analyse the role of innovation in shaping India's entrepreneurial ecosystem, evidenced by quantitative and qualitative metrics.
- To assess sectoral, geographic, and demographic dimensions contributing to ecosystem vibrancy.
- To examine the impact of government policies, funding trends, and gender inclusion.
- To identify limitations and challenges facing startups in India.

Hypothesis

h_{01} : There is no relation in Innovation-led startups in India in higher economic growth, job creation, and social inclusion.

Area and Sample Size

- Area: Pan-India coverage of startups across all major metropolitan, tier-II, and tier-III regions.
- Sample Size: Secondary data analysis utilized official datasets from DPIIT, Startup India, NASSCOM, and industry reports covering more than 150,000 startups in 2024.

Data Collection and Analysis

Data were collected from government sources and scholarly publications to create quantitative evidence and detailed tables illustrating ecosystem evolution.

Year-wise Growth of Startups and Employment: Growth trajectory of Indian startup ecosystem showing exponential increase in both startup registrations and job creation from 2019 to 2024

Table 01: Year-wise Growth of Startups and Employment (2019-2024)

Year	Total Startups	Funding (Billion USD)	Jobs Created (Lakhs)	Unicorns	YoY Growth Startups (%)	YoY Growth Jobs (%)
2019	10,604	11.0	5.00	30	N/A	N/A
2020	11,000	11.0	7.50	38	3.7	50.0
2021	50,000	36.0	10.2	44	354.6	36.0
2022	61,400	18.2	12.8	68	22.8	25.5
2023	99,000	6.0	14.5	100	61.2	13.3
2024	157,066	11.3	15.53	108	58.7	7.1

Source: RBI Reports, 2024; Startup India Factsheet" (2024); & NASSCOM and Invest India sector reports (2024)

The data reflects the exponential growth of India's startup ecosystem between 2019 and 2024, showcasing remarkable expansion in both scale and impact. Startups grew from 10,604 in 2019 to over 157,000 in 2024, with the sharpest rise observed in 2021 when figures jumped nearly fivefold, driven largely by policy support and increased investor confidence. Funding peaked at USD 36 billion in 2021 during the global investment surge but declined thereafter, indicating volatility in funding flows despite continuous startup growth. Job creation also rose steadily, from 5 lakh in 2019 to 15.53 lakh in 2024, though its growth

rate slowed after 2022. The number of unicorns increased consistently, surpassing 100 by 2023, signifying India's rise as a global entrepreneurial hub. Overall, the data highlights strong momentum, though the mismatch between rising startup numbers and fluctuating funding suggests structural challenges in sustaining capital flow and ecosystem stability.

State-wise Distribution of Startups: Geographic distribution of startup registrations across Indian states in 2023, highlighting regional concentration patterns

Table 02: State-wise Distribution of Startups (2023)

State	Startups
Maharashtra	5,816
Karnataka	3,036
Delhi	3,162
Uttar Pradesh	3,431
Gujarat	3,295
Tamil Nadu	2,816
Telangana	1,760
Haryana	1,742
Kerala	1,296
Rajasthan	1,445

Source: Startup India Factsheet” (2024)

The geographic distribution of startups in 2023 reflects both concentration in established metropolitan hubs and the growing spread to emerging regions. Maharashtra leads with 5,816 startups, reaffirming its role as India's financial and commercial hub, supported by strong infrastructure, investor presence, and access to markets. Karnataka (3,036) and Delhi (3,162) follow, with Bengaluru and Delhi NCR long recognized as innovation-driven clusters, especially in IT, SaaS, e-commerce, and fintech. Interestingly, non-traditional states such as Uttar Pradesh (3,431) and Gujarat (3,295) also report significant startup activity, indicating increasing diffusion beyond metros, supported by proactive state policies and improved digital access. Tamil Nadu (2,816) and Telangana (1,760) further showcase the role of technology hubs like Chennai and Hyderabad. Meanwhile, states like Kerala (1,296) and Rajasthan (1,445) reflect promising but smaller ecosystems with sectoral niches such as tourism, healthcare, and agritech. Overall, the data highlights both concentration in leading hubs and democratization of entrepreneurship across tier-II and tier-III regions.

Sector-wise Funding Distribution

Sectoral funding allocation in India's startup ecosystem showing dominance of fintech, e-commerce and health tech sectors

Table 03: Sector-wise Funding Distribution

Sector	No. of Startups	Funding Share (%)
Fintech	15,000	18
E-commerce	12,000	15

Health Tech	8,500	12
Ed Tech	7,000	10
SaaS	6,500	9
Deep Tech	5,000	8
Enterprise Tech	4,500	7
Agri Tech	3,500	6
Clean Tech	3,000	5
Logistics	2,800	4

Source: NASSCOM’s Sectoral Startup Report (2024); & KPMG’s “Democratisation of Entrepreneurship in India” report (2024)

The sector-wise analysis of India’s startup ecosystem highlights fintech, e-commerce, and health tech as the dominant recipients of funding, together accounting for 45% of total allocation. Fintech leads with 18% share and 15,000 startups, reflecting India’s rapid digitalization, UPI adoption, and financial inclusion initiatives. E-commerce follows closely at 15%, driven by rising internet penetration, consumer demand, and logistics integration. Health tech, with 12%, has gained momentum post-pandemic, addressing gaps in accessibility, telemedicine, and affordable healthcare innovation. Ed tech (10%) and SaaS (9%) demonstrate India’s strength in digital learning and enterprise solutions, bolstered by its IT talent pool. Deep tech (8%) and enterprise tech (7%) represent the next wave of disruptive innovation, though requiring higher R&D investment. Meanwhile, agri-tech, clean tech, and logistics—despite their critical role in inclusive and sustainable growth—together account for only 15% of funding, suggesting untapped potential. Overall, the distribution underscores both sectoral concentration and opportunities for diversification to ensure balanced ecosystem growth.

Key Metrics (2024)

- Total Recognized Startups: 157,066
- Women-led Startups: 73,000 (46.5%)
- Direct Employment Created: 1,553,000
- Total Funding: \$11.3 billion
- Global Ranking: 3rd largest startup ecosystem

Employment Generation by Startups

Recent studies have pointed to the multiplier effect of startup-driven job creation, impacting youth, women, and highly skilled professionals. Most startups are concentrated in major urban clusters but are increasingly spreading to tier-II and tier-III cities.

Innovation Metrics and Ecosystem Indicators

Key innovation indicators include patents, degree attainment, entrepreneurial finance, high-tech density, university presence, and sectoral diversity. The India Innovation Index ranks states based on R&D expenditure, infrastructure, and knowledge spillovers, with Karnataka and Maharashtra leading in ecosystem quality.

Results

Evidence of Innovation's Role

- The number of startups and unicorns have grown exponentially in India since 2016, testifying to a vibrant entrepreneurial ecosystem.
- Government programs have catalysed this growth by simplifying compliance, offering funding, and democratizing entrepreneurship across regions and social groups.
- Sectoral innovation in fintech, SaaS, health tech, and deep tech has spurred job creation and positioned Indian startups for global competitiveness.
- The rise of women entrepreneurs and the entry of startups from non-metro cities reflect the inclusive nature and expansive reach of India's entrepreneurial transformation.
- Challenges remain in regulatory complexity, uneven infrastructure, limited access to early-stage finance, and competitive pressures. Effective collaborative stakeholder models and continuous policy evolution are necessary to sustain and scale ecosystem growth.

Conclusion

Innovation is central to the resilience, growth, and competitiveness of the Indian entrepreneurial ecosystem. Government initiatives, venture capital influx, knowledge spillovers, and digital infrastructure have collectively shaped a landscape where startups drive economic transformation, job creation, and social inclusion. Despite structural and regulatory challenges, the entrepreneurial spirit powered by innovation has propelled India towards its vision of becoming a global powerhouse, with regional clusters and sectoral diversity assuring a dynamic, forward-looking future.

To unlock further potential, future research should employ longitudinal analysis of policy impacts, measure ecosystem health in emerging regions, and address social inclusion for underrepresented founders. Targeted interventions to address funding gaps, regulation, and infrastructure, along with robust performance metrics, will continue to steer India's innovation-led entrepreneurial journey.

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