

Start-up Ecosystems in India: The Role of Innovation, Incubation and Government Support

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Abstract

The start-up ecosystem has emerged as an important component of India's economic development, contributing to innovation, employment generation, technological advancement and entrepreneurial activity. The development of this ecosystem depends on the interaction of entrepreneurs, investors, educational institutions, research organisations, business incubators and government agencies. This study examines the role of innovation, incubation and government support in promoting the growth of start-ups in India. It uses a descriptive and analytical research design based on secondary data collected from the Department for Promotion of Industry and Internal Trade (DPIIT), the Government of India, and other relevant publications available up to May 2025. The empirical analysis indicates a substantial expansion of the start-up ecosystem following the launch of the Startup India initiative in January 2016. The number of DPIIT-recognised start-ups increased from approximately 500 in 2016 to 1,57,706 as of 31 December 2024. These recognised start-ups reportedly generated more than 17.28 lakh direct jobs. Government programmes such as Startup India, the Fund of Funds for Startups, the Startup India Seed Fund Scheme and the Atal Innovation Mission have contributed institutional mechanisms for financing, mentoring and developing entrepreneurial capabilities. However, access to early-stage capital, regional inequalities, limited commercialisation of research, market uncertainty and business sustainability remain important challenges. The study concludes that a coordinated approach involving innovation, effective incubation, accessible finance and outcome-oriented government support is essential for the sustainable development of India's start-up ecosystem.

Keywords: *Start-up ecosystem; innovation; incubation; Startup India; entrepreneurship; government support; employment generation; India.*

Introduction

Entrepreneurship is widely recognised as an important driver of economic growth, structural transformation and employment generation. In a developing economy such as India, start-ups can contribute to the introduction of new products, improvement of production processes, development of digital services and creation of innovative business models. They may also help address social and economic challenges in agriculture, healthcare, education, financial services, manufacturing and environmental sustainability.

A start-up ecosystem consists of the interconnected institutions, organisations, resources and individuals that facilitate the creation and growth of new enterprises. Its major participants include entrepreneurs, venture capitalists, angel investors, commercial banks, universities, research institutions, incubators, accelerators, government agencies and

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customers. The effectiveness of the ecosystem depends not only on the availability of finance but also on access to technology, skilled workers, infrastructure, mentorship and markets.

India launched the Startup India initiative on 16 January 2016 to encourage innovation, facilitate entrepreneurship and support the development of new enterprises. The initiative introduced measures relating to simplified compliance, funding support, intellectual property rights, public procurement and industry-academia collaboration.

According to the Government of India, 1,57,706 start-ups had received DPIIT recognition by 31 December 2024. These recognised enterprises had reportedly generated more than 17.28 lakh direct jobs. The government also reported that over 51% of recognised start-ups originated in Tier II and Tier III cities, indicating the geographical expansion of entrepreneurial activity. These figures describe the recognised start-up sector rather than every new business operating in India.

Despite this expansion, important questions remain concerning the quality of innovation, effectiveness of incubation, accessibility of government schemes and long-term survival of start-ups. The present study examines these issues using officially reported data available before May 2025.

Statement of the Problem

India's start-up ecosystem has expanded considerably, but the growth of registered or recognised enterprises alone does not establish whether they are commercially sustainable, technologically innovative or successful in generating long-term employment.

Many entrepreneurs face difficulties in converting ideas into marketable products, securing seed capital, protecting intellectual property and accessing experienced mentors. The availability of incubation facilities and financial support also varies across locations and institutions.

The central problem addressed by this study is therefore to understand how innovation, incubation and government support contribute to the development of India's start-up ecosystem and to identify the constraints that may limit its inclusive and sustainable growth.

Objectives of the Study

The study has the following objectives:

1. To examine the growth of the Indian start-up ecosystem between 2016 and December 2024.
2. To analyse the role of innovation in promoting entrepreneurship and competitiveness.
3. To study the contribution of business incubators and accelerators to start-up development.
4. To examine major government initiatives supporting start-ups in India.
5. To analyse available empirical evidence concerning start-up recognition and employment generation.
6. To identify the major challenges faced by start-ups and suggest policy measures for sustainable development.

Research Methodology

The study follows a descriptive and analytical research methodology.

Nature of the study: Descriptive study based on secondary data.

Sources of data: Government of India publications, DPIIT reports, Press Information Bureau releases, Startup India publications and relevant academic literature.

Reference period: 2016 to 31 December 2024, with information published or available by May 2025.

Analytical tools: Percentage change, annual comparisons, tabular analysis and graphical presentation.

Scope: The study covers the national start-up ecosystem, including innovation, incubation, financing, employment generation and public policy.

The study does not use a primary survey or firm-level econometric model. Consequently, the findings identify observed trends and institutional relationships but do not independently establish that a particular government scheme caused a specified increase in start-ups or employment.

Limitations of the study

- DPIIT recognition figures do not represent the total number of new businesses in India.
- Employment figures are reported by recognised start-ups and should be interpreted as reported direct employment, not independently audited net job creation.
- Recognition data measure formal participation in the ecosystem rather than start-up survival, profitability or innovation quality.
- The study uses aggregate national data, which may conceal differences between states, sectors, genders and enterprise sizes.

Review of Literature

Schumpeter (1934): Innovation and entrepreneurship

Schumpeter, in *The Theory of Economic Development*, emphasised the role of entrepreneurs in introducing new products, production methods, markets, sources of supply and forms of business organisation. His work provides a theoretical foundation for understanding start-ups as potential agents of innovation and economic change. The framework suggests that entrepreneurial activity can contribute to economic development when new combinations of resources and technologies are introduced.

Isenberg (2010): Entrepreneurship ecosystems

Isenberg's work on entrepreneurship ecosystems highlighted the importance of an integrated environment involving policy, finance, culture, support institutions, human capital and markets. This perspective suggests that entrepreneurship cannot be promoted through a single intervention. Effective ecosystems require coordination among multiple stakeholders.

Stam (2015): Entrepreneurial ecosystems and regional development

Stam examined entrepreneurial ecosystems as a framework for understanding how regional conditions influence productive entrepreneurship. The approach draws attention to the interaction between institutions, networks, finance, leadership, talent and demand. It is relevant to India because start-up opportunities and support infrastructure differ across states and cities.

Government of India: Startup India

The Startup India Action Plan, introduced in 2016, established a policy framework for simplifying procedures, improving funding access, providing incentives and promoting incubation and industry–academia partnerships. Government reports subsequently documented a substantial increase in the number of DPIIT-recognised start-ups. These reports provide an important empirical basis for examining the scale of the formal start-up ecosystem, although recognition growth alone cannot establish the causal impact of the initiative.

Government of India: Employment and inclusion

Official figures published in 2024 reported that DPIIT-recognised start-ups had generated over 15.53 lakh direct jobs by 30 June 2024. A separate government report stated that 67,499 recognised start-ups had at least one woman director

at the same date. These indicators provide evidence of reported employment generation and women's participation in formal start-up ownership or leadership structures. However, the presence of a woman director does not necessarily establish women's ownership share, operational control or employment conditions.

Research gap

The literature establishes the importance of innovation, entrepreneurial ecosystems and institutional support. Government reports provide data on start-up recognition and employment. However, recognition statistics alone cannot show how effectively innovation, incubation and government assistance translate into commercial success.

This study addresses the issue by bringing these three dimensions together in a descriptive analysis of India's start-up ecosystem, using data available up to May 2025.

Conceptual Framework of the Start-up Ecosystem

A start-up ecosystem can be understood as an interconnected system in which different forms of support help entrepreneurs transform ideas into viable enterprises.

Innovation: Research, new ideas, technology, product development and problem-solving

Incubation and Mentoring: Business planning, prototype development, technical assistance and market validation

Finance and Government Support: Seed funding, investment facilitation, credit access, policy support and procurement opportunities

Expected Economic Outcomes: Enterprise growth, employment, commercialisation, productivity and wider market access

The framework illustrates a proposed relationship rather than an empirically estimated causal model. Successful outcomes also depend on customer demand, management capability, competition, infrastructure and broader economic conditions.

Growth of the Start-up Ecosystem in India: Empirical Analysis

Growth in DPIIT-recognised start-ups

The number of start-ups recognised under the Startup India initiative increased substantially between 2016 and December 2024. The following data are drawn from the Department for Promotion of Industry and Internal Trade's reported recognition figures.

Table 1. Annual DPIIT start-up recognition certificates issued

Financial year	Recognition certificates issued
2016–17	743
2017–18	7,966
2018–19	8,625
2019–20	13,139
2020–21	16,342
2021–22	21,361
2022–23	29,688
2023–24	34,200

2024–25 (up to 31 Dec. 2024) 25,642

Cumulative total 1,57,706

Source: DPIIT, Annual Report 2024–25, Startup India Initiative, p. 50.

The data reveal a marked expansion in formal start-up recognition. Annual recognition certificates increased from 743 in 2016–17 to 34,200 in 2023–24. The figures for 2024–25 are incomplete and should not be compared directly with full-year totals.

Employment generation by recognised start-ups

Employment generation is one of the important economic outcomes associated with start-up development. According to a Government of India report published in February 2025, recognised start-ups had generated more than 17.28 lakh direct jobs as of 31 December 2024.

Table 2. Reported direct employment generated by DPIIT-recognised start-ups

Year	Direct jobs reported
2016	306
2017	51,980
2018	1,00,646
2019	1,63,463
2020	1,81,404
2021	2,10,545
2022	2,74,685
2023	3,91,943
2024 (up to 30 June)	1,78,316

Source: Ministry of Commerce and Industry, Government of India, Press Information Bureau, 6 August 2024.

Geographical and gender-related inclusion

The geographical spread of entrepreneurship is another important dimension of ecosystem development. Government figures published in February 2025 indicated that over 51% of recognised start-ups originated in Tier II and Tier III cities. This suggests that start-up activity extends beyond India's largest metropolitan centres.

In addition, as of 30 June 2024, 67,499 DPIIT-recognised start-ups had at least one woman director. These indicators suggest broader participation in the formal ecosystem. However, more detailed data are needed to establish whether entrepreneurs in smaller cities have comparable access to investment, incubation, skilled labour and markets, and whether women have equal access to leadership and finance.

Role of Innovation in the Start-up Ecosystem

Innovation is a central element of entrepreneurship because it enables businesses to introduce new solutions, improve existing services and respond to changing consumer needs.

- ❖ **Product and process innovation:** Start-ups can develop new products and improve production processes using technology, design and specialised knowledge. Innovations in software, healthcare devices, agricultural technologies and manufacturing processes may help address unmet needs and improve productivity.

- ❖ **Digital innovation:** Digital technologies have reduced some barriers to starting and operating businesses. Cloud computing, digital payments, e-commerce platforms, artificial intelligence and mobile applications allow enterprises to reach customers without establishing extensive physical infrastructure. However, the benefits depend on access to reliable connectivity, digital skills, cybersecurity and affordable technology.
- ❖ **Innovation in agriculture and rural development:** Agricultural start-ups can provide digital market information, farm-management tools, supply-chain solutions, precision-farming services and technologies for storage and processing. These innovations may help reduce information gaps and improve market access for farmers. Their effectiveness depends on affordability, local-language support, rural connectivity and the practical needs of farmers.
- ❖ **Social and green innovation:** Start-ups working in renewable energy, waste management, water conservation, affordable healthcare and educational technology can develop solutions to social and environmental challenges. Such enterprises may combine commercial objectives with wider developmental goals.
- ❖ **Commercialisation of research:** Universities and research institutions generate scientific knowledge, but the transition from research to a marketable product can be difficult. Collaboration among researchers, entrepreneurs, investors and industry can help transform research outcomes into commercially viable technologies.

Intellectual property support, prototype grants, testing facilities and technology-transfer offices are particularly relevant to this process.

Role of Incubation in Start-up Development

Business incubation provides early-stage enterprises with resources and guidance to develop their ideas and business models. Incubators may operate through universities, government institutions, research centres or private organisations.

1. **Infrastructure and shared facilities:** Incubators may provide office space, laboratories, internet connectivity, meeting facilities, equipment and access to technical infrastructure. Shared resources can reduce initial operating costs, particularly for technology-intensive enterprises.
2. **Mentoring and business development:** Entrepreneurs often require support in preparing business plans, identifying target customers, pricing products, managing finances and building teams. Experienced mentors can help founders assess risks and refine their strategies.
3. **Access to investors:** Incubators can connect start-ups with angel investors, venture capital funds, banks and other financing institutions. They may also help entrepreneurs prepare financial projections, investment presentations and funding applications. Such connections improve access to potential financiers but do not guarantee that a start-up will receive investment.
4. **University–industry collaboration:** Academic incubators can facilitate interaction between students, researchers and businesses. They can support student entrepreneurship, research commercialisation and industry-linked innovation.
5. **Atal Innovation Mission:** The Atal Innovation Mission (AIM), established by NITI Aayog, promotes innovation and entrepreneurship through initiatives that include Atal Tinkering Labs and Atal Incubation Centres. These initiatives support innovation-related learning and the development of entrepreneurial capabilities.
6. **Incubation-related challenges:** Despite their potential, incubation facilities may face constraints such as limited specialist mentors, inadequate laboratory infrastructure, weak investor networks and uneven regional distribution. Some incubators may also focus excessively on the number of enterprises admitted rather than their long-term outcomes.

Therefore, incubation performance should be assessed through indicators such as enterprise survival, follow-on investment, commercialised products, intellectual property, revenue growth and quality employment.

Role of Government Support in India

Government policy can reduce barriers to entrepreneurship by improving access to finance, simplifying regulations, supporting research and facilitating access to markets.

The principal initiatives relevant to the period covered by this study are discussed below.

1. **Startup India:** Launched on 16 January 2016, Startup India provides a policy framework for promoting entrepreneurship. Its measures include DPIIT recognition, facilitation of compliance, intellectual property support, public procurement provisions and access to other eligible benefits. The programme seeks to create an environment in which innovative enterprises can be established and expanded.
2. **Fund of Funds for Startups:** The Fund of Funds for Startups was established with a corpus of ₹10,000 crore and is operated through SIDBI. Rather than investing directly in individual start-ups, the mechanism commits capital to eligible alternative investment funds, which then invest in enterprises. It is intended to help expand the domestic risk-capital ecosystem.
3. **Startup India Seed Fund Scheme:** The scheme was introduced in 2021 with an approved outlay of ₹945 crore. It supports eligible early-stage start-ups through selected incubators, including for proof of concept, prototype development, product trials and market entry. Its design addresses the financing gap that can arise before an enterprise becomes attractive to conventional investors.
4. **Atal Innovation Mission:** AIM supports innovation and entrepreneurship through school-level innovation facilities, incubation infrastructure and ecosystem partnerships. It seeks to encourage problem-solving, experimentation and entrepreneurial capabilities among students and innovators.
5. **Make in India and Digital India:** Make in India is relevant to manufacturing, industrial innovation and investment, while Digital India supports digital infrastructure and service delivery. These broader programmes can create opportunities for start-ups, although their objectives and benefits are not exclusively directed towards start-up enterprises.

The existence of these schemes establishes the range of policy instruments available to entrepreneurs. Their effectiveness must be assessed separately by examining awareness, eligibility, application procedures, actual disbursement, additional private investment and enterprise outcomes.

Major Challenges Facing Start-ups in India

Despite the expansion of the ecosystem, start-ups face several structural and operational constraints.

- ❖ **Limited access to early-stage finance:** Many start-ups lack collateral, a stable revenue stream or a proven business model. Traditional lenders may consider them risky, while equity investors generally seek enterprises with substantial growth potential. This creates a financing gap, especially during the idea-development and prototype stages.
- ❖ **Regional inequalities:** Although start-up activity has expanded into smaller cities, access to venture capital, specialist mentors, research infrastructure and experienced professionals remains uneven. Entrepreneurs outside established hubs may face higher costs in building networks and accessing markets.
- ❖ **Regulatory and compliance requirements:** Registration, taxation, labour compliance, intellectual property protection and sector-specific approvals can impose costs on young businesses. The burden may be particularly significant for founders without specialised legal and accounting support.
- ❖ **Shortage of specialised skills:** Technology-intensive enterprises require employees with relevant technical, managerial and commercial skills. Gaps in product development, financial management, marketing and leadership can affect enterprise performance.

- ❖ **Market access and competition:** A technically innovative product may not achieve commercial success if customers are unwilling to pay for it. Start-ups must compete with established firms, understand consumer preferences and develop effective distribution channels.
- ❖ **Business sustainability:** Rapid expansion does not necessarily imply profitability. High operating costs, dependence on external investment, weak cash-flow management and uncertain demand can threaten long-term survival.
- ❖ **Unequal access to entrepreneurial opportunities:** Women entrepreneurs, rural innovators and founders from economically disadvantaged backgrounds may face additional barriers in accessing finance, professional networks and business opportunities. General improvements in recognition figures do not by themselves establish equal access to resources.

Findings of the Study: Based on the descriptive analysis of official data and the review of relevant literature, the following findings emerge.

1. Expansion of formal entrepreneurship: DPIIT-recognised start-ups increased from approximately 500 in 2016 to 1,57,706 by 31 December 2024. This indicates substantial growth in formal participation in India's start-up ecosystem.
2. Reported employment generation: Recognised start-ups reportedly generated over 17.28 lakh direct jobs by the end of December 2024. The figure indicates the employment contribution associated with this sector, subject to the limitations of administrative and self-reported data.
3. Innovation as a source of enterprise development: Innovation enables start-ups to introduce new products, improve processes, use digital technologies and address emerging market needs. Its commercial benefits depend on customer demand, technical capabilities and the availability of finance.
4. Importance of incubation: Incubators can help entrepreneurs convert ideas into prototypes and viable business models through mentoring, infrastructure, investor connections and market support. The magnitude of their contribution requires outcome-based evaluation.
5. Multiple forms of government support: Startup India, the Fund of Funds for Startups, the Startup India Seed Fund Scheme and the Atal Innovation Mission provide different forms of institutional, financial and entrepreneurial assistance.
6. Geographical expansion: Government-reported figures indicate that more than 51% of recognised start-ups originated in Tier II and Tier III cities, although the distribution of funding and support infrastructure may remain uneven.
7. Women's participation: The reported number of recognised start-ups with at least one woman director indicates participation by women in the formal start-up ecosystem. Further evidence is required to assess ownership, access to finance and leadership responsibilities.
8. Need for better impact measurement: Start-up recognition and reported job creation are useful indicators of scale, but they do not measure profitability, productivity, survival rates, job quality or the causal impact of individual government programmes.

Suggestions and Policy Recommendations

The following measures could strengthen the Indian start-up ecosystem.

Improve access to early-stage finance

- Expand transparent and accessible seed-funding opportunities for innovative enterprises.
- Improve awareness of existing financing schemes among eligible founders.
- Encourage angel investment and private participation alongside public funding.
- Strengthen credit assessment mechanisms appropriate for enterprises with limited operating histories.
- Publish information on applications, approvals, disbursements and subsequent enterprise outcomes.

Strengthen incubation infrastructure

- Expand effective incubation facilities in universities, government colleges and research institutions.
- Provide access to laboratories, testing facilities, shared equipment and technical experts.
- Establish structured mentoring programmes involving experienced entrepreneurs and industry professionals.
- Evaluate incubators using enterprise survival, commercialisation and employment indicators rather than admission numbers alone.

Promote research and commercialisation

- Encourage university–industry research partnerships.
- Establish technology-transfer and intellectual property support facilities.
- Provide grants for proof of concept, prototype development and product testing.
- Develop mechanisms through which researchers and entrepreneurs can jointly commercialise research outcomes.

Reduce unnecessary compliance burdens

- Simplify procedures and improve coordination among government departments.
- Provide clear, accessible guidance on registration, taxation and sector-specific requirements.
- Improve the availability of online services and time-bound grievance redressal.
- Preserve appropriate safeguards for workers, consumers, the environment and data protection.

Promote entrepreneurship beyond metropolitan centres

- Develop regional incubation and mentoring networks.
- Connect smaller-city enterprises with investors, customers and established companies.
- Provide entrepreneurship training in regional languages where appropriate.
- Encourage start-ups addressing local economic needs, including agriculture, food processing, healthcare and rural services.

Support women and underrepresented entrepreneurs

- Improve access to finance, mentoring, professional networks and business-development programmes.
- Publish disaggregated information on applications, approvals, funding and enterprise outcomes.
- Encourage institutional partnerships that expand entrepreneurial opportunities for women and disadvantaged groups.
- Assess substantive participation and access to resources rather than relying solely on director counts.

Strengthen entrepreneurial education

Educational institutions should integrate entrepreneurship, financial literacy, business planning, innovation and intellectual property awareness into their curricula. Student projects, business-plan competitions, internships and institutional incubators can help students develop practical entrepreneurial capabilities.

Improve start-up performance data

DPIIT and relevant agencies should develop consistent longitudinal indicators covering:

- Enterprise survival after three and five years.
- Revenue growth and profitability.
- Domestic and international market access.

- Private investment mobilised alongside public funding.
- Employment creation, retention and job quality.
- Patents, product commercialisation and research partnerships.
- Regional and gender-wise access to support.

Such indicators would help policymakers distinguish growth in formal recognition from improvements in enterprise performance.

Conclusion

India's start-up ecosystem has expanded considerably since the introduction of the Startup India initiative in 2016. The growth in DPIIT-recognised enterprises and reported direct employment demonstrates the increasing scale of formal entrepreneurial activity. Innovation, incubation and government support represent three interconnected dimensions of this development. Innovation enables entrepreneurs to create products, services and business models that respond to market needs. Incubation provides the infrastructure, mentoring and networks needed to develop these ideas into enterprises. Government support can reduce entry barriers, facilitate financing, promote research commercialisation and expand access to entrepreneurial opportunities. However, the number of recognised start-ups should not be treated as a complete measure of entrepreneurial success. Long-term outcomes depend on enterprise survival, access to customers, financial sustainability, technological capabilities and the quality of employment generated. Regional disparities and unequal access to finance and mentoring also require attention. The study therefore concludes that sustainable development of India's start-up ecosystem requires coordination among government agencies, educational institutions, research organisations, investors and private enterprises. A policy approach combining innovation-led growth, effective incubation, accessible finance, simplified procedures and systematic impact assessment can help start-ups contribute more effectively to employment generation, productivity and inclusive economic development.

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