



Government – backed incubators as catalysts of innovation: A comparative study of IIT Kanpur SIIC, IIM – Lucknow EIC and AKTU innovation hub in Uttar Pradesh’s startup ecosystem

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Abstract

Government-backed incubators play a vital role in strengthening innovation and entrepreneurship within regional startup ecosystems. This study presents a comparative analysis of SIIC at IIT Kanpur, EIC at IIM Lucknow, and AKTU Innovation Hub in Uttar Pradesh. SIIC demonstrates strong capabilities in deep-tech incubation and technology commercialization, while EIC focuses on managerial support, business development, and scalable ventures. In contrast, AKTU Innovation Hub promotes grassroots innovation and expands entrepreneurial access across affiliated institutions. The findings indicate that these incubators collectively contribute to a multi-layered innovation ecosystem supported by government initiatives. Despite their impact, challenges such as uneven regional development, funding limitations, and scalability persist. The study concludes that government-backed incubators act as key catalysts in bridging academia, industry, and policy to drive innovation-led economic growth in Uttar Pradesh. The study concludes that government - backed incubators act as significant catalysts by bridging the gap between academia, industry, and policy frameworks, thereby accelerating innovation - driven economic development in Uttar Pradesh. However, challenges such as regional disparities, funding constraints, and scalability issues remain areas for further research.

Keywords: Government – backed incubators, Startup ecosystem, Innovation, SIIC IIT Kanpur, EIC IIM Lucknow, AKTU innovation hub, Entrepreneurship, Uttar Pradesh

Introduction

In recent years, innovation-driven entrepreneurship has emerged as a key driver of economic growth, employment generation, and regional development in India. Recognizing this, the government has actively promoted startup ecosystems through policy initiatives, funding mechanisms, and institutional support structures. Among these, government-backed incubators have gained prominence as critical enablers that nurture early-stage ventures by providing infrastructure, mentorship, financial access, and industry linkages. These incubators not only reduce the risks associated with new venture creation but also help translate academic research and innovative ideas into commercially viable enterprises.

In the state of Uttar Pradesh, which has traditionally lagged behind leading innovation hubs, recent policy interventions such as the Startup Policy have accelerated the development of incubation ecosystems within academic institutions. Prominent among these are the Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, the Enterprise Incubation Centre (EIC), IIM Lucknow, and the AKTU Innovation Hub. Each of these incubators operates within a distinct institutional framework and adopts different approaches toward innovation and entrepreneurship development.

The SIIC IIT Kanpur is recognized for its strong focus on deep-technology ventures, research commercialization, and global

startup scaling. In contrast, the EIC IIM Lucknow emphasizes managerial expertise, business incubation, and market-oriented entrepreneurial development. Meanwhile, the AKTU Innovation Hub adopts a decentralized model aimed at fostering grassroots innovation and expanding entrepreneurial opportunities across affiliated institutions throughout the state. Despite the growing significance of these incubators, there remains a need for a systematic comparative analysis to understand their relative contributions, operational models, and impact on the startup ecosystem. This study seeks to address this gap by examining how these government-supported incubators function as catalysts of innovation in Uttar Pradesh. By comparing their structures, services, and outcomes, the research aims to provide insights into the effectiveness of incubation models in promoting inclusive and sustainable entrepreneurial growth.

Research objective

- To examine the role of government-backed incubators in promoting innovation and entrepreneurship in Uttar Pradesh.
- To analyze the operational structure and support mechanisms of Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub.

- To compare the effectiveness of these incubators in terms of mentorship, funding access, and startup support services.
- To evaluate the impact of incubation on startup performance, including innovation output, growth, and survival rate.
- To identify the challenges and gaps in the functioning of government-backed incubators and suggest improvements for strengthening the startup ecosystem.

Research questions

- How do government-backed incubators contribute to the development of innovation and entrepreneurship in Uttar Pradesh?
- What are the key operational models and support mechanisms adopted by Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub?
- Is there a significant difference in the effectiveness of incubation services (mentorship, funding, networking) among these incubators?
- How does incubation support influence startup performance in terms of innovation, growth, and survival?
- What are the major challenges faced by startups within these incubators, and how can the incubation ecosystem be improved?

Literature review

- **Hackett, S. M. & Dilts, D. M. (2004)** ^[1]: Their study conceptualizes business incubation as a structured process that enhances startup survival and growth. The authors argue that incubators act as intermediaries providing resources, mentoring, and networks, thereby reducing uncertainty and improving venture performance.
- **Phan, P. H., Siegel, D. S. & Wright, M. (2005)** ^[2]: These authors emphasize the role of university-based incubators in commercializing research and fostering innovation. Their findings suggest that academic incubators contribute significantly to technology transfer and regional economic development.
- **Bergek, A. & Norrman, C. (2008)** ^[3]: The study highlights that incubators differ in structure and performance based on their operational models. It identifies key components such as selection processes, support services, and resource allocation as critical determinants of incubation success.
- **Bruneel, J., Ratinho, T., Clarysse, B. & Groen, A. (2012)** ^[4]: Their research distinguishes between different generations of incubators, noting a shift from infrastructure-based support to value-added services such as mentoring, networking, and access to finance. This evolution enhances startup competitiveness and long-term sustainability.
- **Chandra, A. & Fealey, T. (2009)** ^[5]: The authors compare incubation models across countries and conclude that government-supported incubators are particularly effective in emerging economies where institutional support systems are still developing.

- **Lala, M. K. & Sinha, S. (2019)** ^[6]: Focusing on India, this study highlights that technology business incubators play a vital role in promoting startups by providing infrastructure, funding access, and mentoring. The authors argue that incubators strengthen the linkage between academia and industry, which is essential for innovation-driven growth.
- **Ali, N., Shakeel, A., Kamal, M., Ahmad, S. & Khan, T. A. (2025)** ^[7]: This recent study examines innovation adoption and sustainability performance in small and medium enterprises in Uttar Pradesh. It finds that institutional support, including incubation and policy frameworks, significantly influences innovation outcomes and long-term sustainability of enterprises.

Research gaps

1. **Lack of region-specific comparative studies:** Existing research largely focuses on national or global incubation models, with limited comparative analysis of incubators within Uttar Pradesh.
2. **Limited comparison of institutional incubation models:** There is insufficient research comparing technology-driven incubators like Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, management-based incubators like Enterprise Incubation Centre (EIC), IIM Lucknow, and decentralized models like AKTU Innovation Hub.
3. **Insufficient empirical evidence on incubation outcomes:** Many studies discuss incubation conceptually, but lack empirical data on startup performance indicators such as innovation output, survival rate, and scalability.
4. **Neglect of grassroots and decentralized innovation systems:** Limited attention has been given to how university-wide hubs like AKTU Innovation Hub contribute to inclusive and grassroots entrepreneurship.
5. **Gaps in understanding challenges and policy effectiveness:** There is a lack of focused research on the operational challenges, funding constraints, and policy implementation issues faced by government-backed incubators at the state level.

Scope of the study

- This study focuses on examining the role of government-backed incubators as catalysts of innovation within the startup ecosystem of Uttar Pradesh. It specifically analyzes and compares three major institutional incubators: Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub.
- The study is limited to understanding the incubation processes, support services, and their impact on startup performance, including innovation, growth, and survival. It covers key aspects such as mentorship, funding access, infrastructure, and networking opportunities provided by these incubators. The research also explores differences in operational models technology-driven, management-oriented, and decentralized approaches to highlight their relative effectiveness.

- Geographically, the study is confined to Uttar Pradesh, making it region-specific, while institutionally it focuses only on the selected incubators and their associated startups. The study primarily considers startups that are currently incubated or have been recently incubated within these institutions.
- The scope further includes analyzing both qualitative and quantitative data collected from stakeholders such as startup founders, incubator managers, and policy documents. However, it does not extend to private incubators, international comparisons, or long-term longitudinal analysis beyond the study period.

Methodology

This study adopts a comparative research design to examine the role of government-backed incubators as catalysts of innovation in Uttar Pradesh's startup ecosystem. The research focuses on three prominent incubators: Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub. A mixed-method approach is employed to ensure a comprehensive understanding of their structure, functioning, and impact.

The study is based on both primary and secondary data. Primary data is collected through structured questionnaires and semi-structured interviews with startup founders, incubator managers, and stakeholders associated with these incubators. This helps capture insights into incubation support services, mentoring quality, funding access, and startup performance. Secondary data is gathered from official reports, institutional publications, government policy documents, research articles, and credible online sources to understand the broader policy framework and operational models.

For sampling, a purposive sampling technique is used to select startups incubated within the three institutions, ensuring representation from different sectors such as technology, manufacturing, and services. A sample size of approximately 60–90 respondents (20–30 from each incubator) is considered adequate for meaningful comparison. The study employs both qualitative and quantitative analysis techniques. Quantitative data is analyzed using descriptive statistics, comparative analysis, and graphical representation (such as bar charts and pie diagrams), while qualitative data from interviews is examined through thematic analysis to identify patterns and key insights.

Key variables considered in the study include incubation support services, access to funding, mentorship quality, networking opportunities, startup survival rate, and innovation outcomes. A comparative framework is used to evaluate the performance and effectiveness of each incubator. To ensure validity and reliability, standardized questionnaires are used, and data is cross-verified through multiple sources. Ethical considerations such as informed consent, confidentiality, and unbiased data interpretation are strictly maintained.

Result

- The results of the study reveal that government-backed incubators play a significant role in fostering innovation

and entrepreneurial growth in Uttar Pradesh. The comparative analysis of Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub indicates that each incubator contributes differently based on its institutional focus and operational model.

- The findings show that SIIC IIT Kanpur performs strongly in terms of innovation output, particularly in deep-tech and research-driven startups. Startups incubated at SIIC demonstrate higher levels of technological advancement and access to funding opportunities, leading to better scalability and market competitiveness.
- EIC IIM Lucknow shows significant effectiveness in enhancing the managerial capabilities and business performance of startups. The results suggest that startups associated with EIC benefit from improved strategic planning, marketing skills, and investor readiness, contributing to higher survival and growth rates.
- The AKTU Innovation Hub plays a crucial role in promoting inclusive and grassroots entrepreneurship. The results indicate that it has successfully expanded access to incubation services across a wider network of institutions, encouraging participation from emerging entrepreneurs. However, its impact on high-growth startup scaling is comparatively moderate due to limitations in advanced infrastructure and funding access.

Discussion

The findings of this study highlight the significant role of government-backed incubators in strengthening the startup ecosystem of Uttar Pradesh. The comparative analysis of Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub reveals that each incubator contributes uniquely to innovation and entrepreneurial development through its distinct operational model.

The results indicate that SIIC IIT Kanpur demonstrates strong performance in fostering deep-tech innovation and research commercialization. Its close linkage with a premier technical institution enables startups to access advanced infrastructure, technical expertise, and industry collaboration. This aligns with existing literature that emphasizes the effectiveness of technology-based incubators in promoting high-growth and innovation-driven ventures.

In contrast, EIC IIM Lucknow plays a crucial role in enhancing the managerial and strategic capabilities of startups. The focus on business development, mentorship, and market-oriented approaches helps startups achieve scalability and sustainability. This finding supports the argument that management-oriented incubators are essential for strengthening the commercial viability of entrepreneurial ventures. The AKTU Innovation Hub, on the other hand, reflects a decentralized and inclusive approach to incubation. By extending support across multiple affiliated institutions, it promotes grassroots innovation and increases accessibility to incubation services. The discussion reveals that such models are particularly important in addressing regional disparities and encouraging participation from a broader pool of aspiring entrepreneurs.

Limitations of the study

1. Despite providing valuable insights, this study has certain limitations that should be acknowledged. First, the research is geographically confined to Uttar Pradesh, which limits the generalizability of the findings to other states or national-level startup ecosystems. The results may not fully reflect variations in incubation models across different regions.
2. Second, the study focuses only on three government-backed incubators—Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub—and does not include private incubators or other institutional models, which may provide additional comparative perspectives.
3. Third, the study relies partly on primary data collected through surveys and interviews, which may be subject to respondent bias, limited sample size, and subjective interpretations. The accuracy of findings depends on the reliability and honesty of the respondents.
4. Fourth, the research adopts a cross-sectional approach, capturing data within a specific time frame. It does not account for long-term impacts of incubation on startup growth, sustainability, and innovation outcomes.

Suggestions

- **Strengthening funding mechanisms:** Government agencies should increase seed funding, venture capital access, and financial incentives for startups incubated at Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub to support early-stage innovation and scalability.
- **Enhancing collaboration among incubators:** A strong network and collaboration framework should be developed among different incubators to share resources, expertise, and best practices. This can create a more integrated and efficient startup ecosystem.
- **Improving mentorship and industry linkages:** Incubators should expand their mentorship networks by involving experienced entrepreneurs, industry experts, and investors to provide better strategic guidance and market exposure to startups.
- **Focus on infrastructure and technology support:** Especially for decentralized models like AKTU Innovation Hub, there is a need to strengthen infrastructure, access to advanced technologies, and research facilities to improve innovation outcomes.

Conclusions

This study concludes that government-backed incubators play a pivotal role in strengthening the innovation and startup ecosystem of Uttar Pradesh. The comparative analysis of Startup Incubation and Innovation Centre (SIIC), IIT Kanpur, Enterprise Incubation Centre (EIC), IIM Lucknow, and AKTU Innovation Hub demonstrates that each incubator contributes

uniquely to entrepreneurial development through its distinct model and institutional strengths. The findings reveal that SIIC IIT Kanpur excels in promoting technology-driven innovation and research commercialization, while EIC IIM Lucknow significantly enhances managerial capabilities and business scalability. In contrast, AKTU Innovation Hub plays an essential role in promoting inclusive and grassroots innovation by extending incubation support across a wider network of institutions. Together, these incubators form a complementary and multi-layered ecosystem that supports startups at different stages of development.

However, the study also identifies key challenges such as funding constraints, regional disparities, and limitations in infrastructure and coordination. Addressing these challenges through improved policy implementation, enhanced collaboration, and stronger support mechanisms is crucial for maximizing the impact of incubation programs. In conclusion, government-backed incubators act as effective catalysts of innovation by bridging the gap between academia, industry, and policy frameworks. Strengthening these institutions can significantly contribute to sustainable economic growth, employment generation, and the overall development of the startup ecosystem in Uttar Pradesh.

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