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Original Article

Building a Vibrant Startup Ecosystem in Kerala: The Role of the Kerala Startup Mission in Fostering Innovation and Entrepreneurship

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Abstract: *It is a widely acknowledged fact that the development of a resilient startup ecosystem has become a central policy objective for governments seeking to promote innovation- driven economic growth and employment generation. Kerala has emerged as a notable performer through sustained institutional support and policy interventions led by the Kerala Startup Mission (KSUM). This paper analyses the evolution of Kerala's startup ecosystem with particular emphasis on the role played by KSUM in fostering innovation and entrepreneurship. The study analyses trends in startup formation, employment generation, incubation infrastructure, investment mobilisation, and international exposure during the period 2016-2024 by drawing on secondary data from the annual reports of the Kerala Startup Mission and other relevant government policy documents. The analysis indicates that KSUM has undergone a considerable transformation from a conventional technology business incubator into a comprehensive innovation governance institution in the state. This change has resulted not only in the quantitative expansion of the ecosystem but also in its qualitative development. The findings of the study indicate the effectiveness of state-led interventions such as innovation grants, seed funding, government procurement and institutional entrepreneurship programmes in supporting startup creation, scaling, and long-term sustainability. The research paper concludes that Kerala Startup Mission has played a catalytic role in positioning Kerala as one of India's most structured and mature state-led startup ecosystems.*

Keywords: *Startup Ecosystem, Kerala Startup Mission, Innovation, Entrepreneurship Development.*

I. INTRODUCTION

A) Background of the Study

India's startup ecosystem has witnessed rapid expansion over the past decade, supported by a large domestic market, favourable government policies, increased venture capital inflows, a growing pool of skilled talent, and the entrepreneurial aspirations of the younger population (KPMG,2024). Although a universally accepted definition of a 'startup' remains elusive, startups are generally distinguished by their early stage of development, limited scale of operations, and dependence on external funding for growth. Typically, these enterprises are young firms pursuing innovative ideas, prototypes, or pilot products, and they possess significant scalability potential. In their formative stages, startups are often financed through founders' personal savings and informal networks, while gradually seeking institutional funding to attain commercial viability (ADBI, 2020). Kerala, an investor-friendly state with a high literacy rate, makes it ideal for the startup community, and the state has taken many policy measures in this regard, which include the launch of India's first startup policy to create an entrepreneur-friendly ecosystem (Jyotsna Thomas, Tom Antony, 2024).

The year 2025 marks a decade since the launch of the Startup India initiative in 2016, a landmark programme that significantly reshaped India's entrepreneurial landscape. Over this period, Startup India has facilitated large-scale innovation through regulatory reforms, institutional capacity building, and expanded access to entrepreneurial opportunities. The number of recognised startups increased from approximately 500 in 2016 to nearly 2.07 lakh by 2025, reflecting the rapid maturation of India's startup ecosystem (National report on States' Startup Ecosystem Ranking, 2025). It is a widely accepted fact that Kerala has emerged as a prominent example of state-led Startup ecosystem development in the country. The Kerala Startup Mission serves as the nodal agency for implementing the Kerala Technology Startup Policy. KSUM assures comprehensive, end-to-end support to technology-driven enterprises by offering infrastructure, financial assistance, mentorship, and market access. The Government of Kerala declared the year 2022 as the 'Year of Entrepreneurs'. The state has set an ambitious goal of establishing 15,000 startups by 2027 in Kerala. The foundation of Kerala's startup ecosystem was laid through the Kerala Technology Startup Policy, 2014, which introduced key incentives such as capital subsidies of up to 20 per cent for incubators and performance-based grants. The revised policy framework of 2017 also marked a strategic shift from ecosystem creation to startup scaling by introducing mechanisms such as 'Government as Marketplace' procurement (up to INR 20 lakh), innovation

grants of up to INR 12 lakh, and seed funding ranging from INR 25 lakh to INR 2 crore (KSUM report,2025). Kerala's policy-driven focus on innovation was strengthened through the Innovation and Entrepreneurship sub-policy under the Kerala State IT policy, 2017.

B) Statement of the Problem

Though many Indian states have already launched attractive Startup policies and supporting institutions for the development of the startup ecosystem, empirical studies that assess how effectively these organizations function are still limited. Kerala Startup Mission is considered a successful model and has received national recognition under the State Startup Ecosystem Ranking. The detailed analysis of its long-term contribution to startup formation, employment creation, incubation infrastructure, investment mobilisation, and international engagement is relatively limited. Existing research largely highlights policy intentions of the government rather than outcome-based performance. It is, therefore, the present study undertakes a data-driven analysis of Kerala's startup ecosystem under KSUM to assess its institutional role in strengthening the entrepreneurial ecosystem of the state.

C) Objectives of the Study

1. To evaluate the development of Kerala's Startup ecosystem under the leadership of the Kerala Startup Mission (KSUM) during the period from 2016 to 2024.
2. To analyse the major key indicators of entrepreneurship development, such as the number of Startups established, Employment created, Incubation and support infrastructure, and Equity investment mobilisation during the period from 2016 to 2024.
3. To analyse the role of major schemes implemented by KSUM in promoting innovation, entrepreneurial activity, and the scaling of startups in Kerala.

D) Significance of the Study

The present study tries to analyse the effectiveness of the KSUM in fostering innovation-led entrepreneurship activities in Kerala. The study is expected to contribute to the literature on innovation governance, state-led entrepreneurship, and regional startup ecosystem development. The findings are expected to be more useful for entrepreneurs, investors, policymakers, and other entrepreneurship ecosystem enablers. They identify effective policy instruments, institutional practices, and support mechanisms that contribute to startup creation, growth, and long-term sustainability. The outcome of the study is expected to provide a useful reference framework for other Indian states aiming to develop structured, inclusive, and policy-driven startup ecosystems.

E) Scope of the Study

The role of the Kerala Startup Mission in the development of Kerala's startup ecosystem during the period from 2016 to 2024 is covered under the study. It analyses major startup ecosystem factors such as startup formation, employment generation, incubation and innovation infrastructure, institutional entrepreneurship through Innovation and Entrepreneurship Development Centres (IEDCs), international exposure initiatives, and equity investment mobilisation. The study also reviews major schemes implemented by KSUM for the development of entrepreneurship in Kerala. It is to be noted that the scope of the present study is confined to ecosystem-level outcomes and does not extend to firm-level financial performance or sector-specific analyses.

F) Methodology

A descriptive and analytical research design was used using secondary data sources collected from the annual reports of Kerala Startup Mission, policy documents, and other relevant publications related to the state-level startup ecosystem. Various statistical tools, such as comparative growth analysis, percentage analysis, and compound annual growth rate (CAGR), were used to examine changes in selected ecosystem indicators. The analysis covers both long-term trends over the period 2016–2024 and also the recent performance dynamics during the period from 2022 to 2024.

G) Limitations of the Study

The study is based on secondary data collected from official reports of KSUM and other government publications, which may involve limitations related to data aggregation and reporting bias. The absence of primary data from startup founders, investors, or ecosystem stakeholders restricts the depth of qualitative insights. The analysis focuses on aggregate ecosystem indicators and does not assess firm-level outcomes such as profitability, survival rates, or long-term growth trajectories. Despite these limitations, the study provides a comprehensive macro-level evaluation of the contribution of the Kerala Startup Mission to the development of the state's Startup ecosystem in Kerala.

II. REVIEW OF LITERATURE

Funding or capital infusion to a firm at any time in its lifecycle is considered a necessary factor input. In the case of technology-based startups, particularly in the IT sector, the nature of the industry structure is such that the costs of entry for a new venture are very minimal, since there is no need to invest in any physical assets that invite capital expenditure

(Krishna Satyanarayana et al,2021). As nations transition into knowledge-driven economies, technology-based entrepreneurship has emerged as a credible instrument of job creation, innovation and wealth creation (Kirchhoff and Spencer, 2008). Due to a growing market and a thriving ecosystem, Indian startups have the opportunity to be highly successful and to aid in the country's economic growth. However, to thrive in this ecosystem, Startups need to focus on key areas such as market research, building a strong team, fostering innovation, leveraging technology, forming strategic partnerships, and adopting a customer-centric approach (Pragati Gupta, Anvita Raghuvanshi,2024). The Prime Minister's Startup India campaign is a great initiative to boost entrepreneurship in India. This initiative will play a very important role in further facilitating startups and providing a new dimension to entrepreneurship in the country (Meenakshi et.al, 2018). The Government has successfully implemented various schemes to improve the industrial environment of the state through the development of exemplary industrial infrastructure, promoting innovations and entrepreneurship, and providing basic skill development mechanisms (Noufal, K.V. Ramachandran,2017). Startups not only create jobs but also contribute to the growth of ancillary industries, such as logistics, marketing, and software development, creating additional employment opportunities and driving further skill development across the economy. (Dheeraj Kumar, Arvind Kumar Yadav,2024)

Shameera and Vennila (2025) in their study analysed the role of the Kerala startup ecosystem in disseminating startup culture across the state. It is found that Kerala has developed a strong and supportive startup culture through a well-integrated ecosystem comprising incubators, funding agencies, mentoring networks, and policy support. Berry Holaday, Derry Holaday, and Ajith Kumar (2019) explored the startup ecosystem prevailing in Kerala and assessed the effect of government interventions through KSUM. It highlighted that sustained institutional support enabled the development of over 1500 startups, many of which received global recognition for innovation and growth potential. Praveena Vijayan (2020) examined the role of startups in entrepreneurial development in Kerala, with a particular focus on Entrepreneurship Development Clubs established in colleges. It is found that these clubs play a significant role in incubating entrepreneurial values among youth, with financial assistance provided by the District Industries Centre. Bobbin Chandra et al (2024) analysed the problems faced by startups in Kerala despite the presence of a supportive ecosystem. It is found that financial constraints, marketing challenges, and product validation issues are major hurdles in the entrepreneurial process.

Reshma and Gracious (2023) analysed institutional support for seed capital funding in Kerala's startup ecosystem, and their findings show that government support at the preliminary stage significantly contributed to ecosystem growth. The study highlighted the potential of investments in emerging sectors such as green technology, aeronautics, and creative industries to reduce unemployment and improve socio-economic outcomes. Syam, Pradeep, and Satish (2018) analysed the role of entrepreneurship in economic growth and development, particularly in developing economies like India. The study emphasized entrepreneurship as a catalyst for innovation, job creation, and social transformation. It highlighted the importance of fostering entrepreneurial skills among educated youth to address persistent challenges such as poverty and unemployment.

Fakih Amrin Kamaluddin and Kala Seetharam Sridhar (2021) evaluated the performance of various government programmes implemented for benefitting startups in India. They found that the performance of public programmes implemented for the encouragement of startups in India is not promising, and the acceptance rate under the flagship programme of the government, 'Startup India', was nearly 5% to 7%.

III. SCHEMES OF KSUM

A) Innovation grant

The innovation grant scheme is a core public policy instrument for nurturing early-stage innovation and solving financial constraints faced by entrepreneurs during the initial stages of business process development. An important feature of the scheme is its tiered funding structure, which enables differentiated financial support based on the maturity level of startups. Financial assistance is provided from the ideation stage through scale-up, with special consideration for students, women, and transgender entrepreneurs, thereby reinforcing inclusiveness within the Startup ecosystem.

B) Rent subsidy scheme for Startups

Another important attractive scheme of KSUM is the rent subsidy scheme for Startups. The Rent subsidy scheme seeks to reduce infrastructure-related costs for high-performing startups at the scale-up stage of business units. Registered Startups with DPIIT and operation in Kerala are entitled to reimbursement of up to 50 per cent of rent or Rs 20 per square feet, whichever is less, for a specific period.

C) Scheme for women entrepreneurs

KSUM gives special emphasis on promoting women-led entrepreneurship. Women entrepreneurs receive higher grant ceilings under the Innovation grant scheme, along with enhanced support through the seed fund scheme. This scheme offers extended moratorium periods of up to two years. The soft loan scheme for women entrepreneurs provides working capital support for executing projects awarded by government departments and public sector undertakings.

D) Innovation and Entrepreneurship Development Centres

Innovation and Entrepreneurship Development Centres (IEDCs) are a flagship programme of KSUM for fostering entrepreneurial culture at the grassroots level. IEDCs are already established in various engineering colleges, management institutes, arts and science colleges, and polytechnics. It serves as the first institutional platform for student innovation and entrepreneurship.

E) Market support scheme

The marketing support scheme addresses market visibility challenges faced by early-stage, revenue-generating startups. Under this scheme, KSUM subsidises up to 70 per cent of the cost of developing professional product or explainer videos, subject to a maximum of Rs 1.5 lakh per startup. Video production is undertaken through KSUM empanelled agencies.

F) Fail Fast or Succeed Programme

The fail-fast or succeed programme is designed to accelerate startup growth by encouraging rapid experimentation, timely pivots, and evidence-based decision-making. Through structured mentoring, expert guidance, and periodic performance reviews, the programme enables startups to respond effectively to market feedback and improve their probability of long-term success.

G) Kerala as a Leader in the States' Startup Ecosystem Ranking

Kerala participated in all 6 reform areas and 19 action points under the 5th edition of the state's startup ecosystem ranking framework. State secured its position as a 'Leader' state in category A. The state's performance is reflected in percentile scores that indicate Kerala's relative standing across reform areas compared to other states and Union territories in the same category. Higher percentile scores denote stronger performance, with the 100th percentile representing the highest level of achievement. Kerala's assessment encompassed six critical reforms that are central to startup ecosystem development.

Table 1: Reform Area-wise Performance of Kerala in the State's Startup Ecosystem Ranking (5th Edition)

Reform Area	Percentile Score (%)
Institutional Support	76
Infrastructure Support	63
Funding opportunities	63
Market Access and Reach	80
Ecosystem Capacity Building	44
Focus on Innovation and Sustainability	100

Source: *Report of KSUM, States' Startup, Ecosystem Ranking, 2025*

IV. RESULTS AND DISCUSSION

A) Evolution of the Startup Ecosystem under Kerala Startup Mission: A Comparative Analysis (2016-2024)

Table 2: Comparative Growth Analysis of startups under Kerala Startup Mission (2016 vs 2024)

Indicator	Till 2016	Till March 2024	Growth Multiple (times)	CAGR (%)*
Number of Startups	300	5,200	17.3	31.6%
Number of Employments	3,000	53,000	17.7	31.9%
Number of Incubators	18	63	3.5	17.0%
Ideas Supported	20	709	35.5	41.7%
IEDCs Supported	80	425	5.3	21.4%
Startups with International Support	15	250	16.7	31.2%
Incubation Infrastructure (sq. ft.)	57,000	8,00,000	14.0	29.2%
Equity Investment Raised (₹ Crores)	207	5,600	27.1	38.1%

Source: *Compiled from Kerala Startup Mission Annual Reports of various years.*

It is found that the number of startups supported by KSUM increased from 300 to 5,200. An annual growth rate of about 31.6 per cent indicates a sustained and policy-driven scaling of startup formation in Kerala. This shows the effectiveness of KSUM's incubation, funding, and mentoring ecosystem. Employment generated through KSUM-supported startups increased sharply from 3,000 to 53,000. The growth trend closely mirrors startup growth. This suggests that startup expansion directly contributed to job creation. The employment CAGR of 31.9 per cent highlights KSUM's significant contribution to Kerala's non-traditional employment sector. It is also to be noted that the number of incubators increased from 18 to 63, growing at a comparatively lower CAGR (17%), and this indicates a strategic shift toward quality and scalability rather than merely increasing numbers. The expansion of incubation infrastructure from 57,000 sq. ft. to 8,00,000 sq.ft supports this interpretation, showing emphasis on capacity building and physical ecosystem development. Another interesting point is that the number of ideas supported increased from 20 to 709, the highest growth multiple (35.5 times) among all indicators. This highlights KSUM's strong focus on early-stage innovation, ideation, and pipeline development. The high CAGR (41.7%) reflects the

success of initiatives targeting schools, colleges, and first-time innovators. It is also revealed that the number of Innovation and Entrepreneurship Development Centres supported increased from 80 to 425, indicating deeper institutional integration of entrepreneurship education. Another notable achievement is that the Startups receiving international exposure and support increased from 15 to 250, showing that KSUM has effectively facilitated global market access, accelerators, and exposure programs. Equity investment raised by startups increased from 207 crore to 5.600 crore, registering a 27-fold increase with a high CAGR of 38.1%. This reflects growing investor confidence, improved startup quality, and the maturity of the Kerala startup ecosystem. The growth in funding significantly outpaces infrastructure growth, suggesting a shift toward capital-intensive, scalable ventures.

B) Growth and Performance of Kerala Startup Mission (2022-24)

Table 3: Growth and Performance of Kerala Startup Ecosystem (2022–2024)

Indicator	2022	2023	2024	% Growth (2022–2024)
Number of Startups	3,900	4,652	5,200	33.33%
Number of Employments	38,500	40,750	53,000	37.66%
Number of Incubators	63	63	63	0%
Ideas Supported	400	709	709	77.25%
Incubation Infrastructure (sq. ft.)	8,00,000	8,00,000	8,00,000	0%
Equity Investment Raised (₹ Crores)	4,300	5,500	5,600	30.23%

Source: *Compiled from Kerala Startup Mission Annual Reports of various years.*

Table 3 shows key factors showing the performance and expansion of Kerala's startup ecosystem for the period from 2022 to 2024. The number of registered startups increased from 3,900 in 2022 to 5,200 in 2024, representing a growth of 33.33 per cent. This quantitative expansion is accompanied by a sharper increase in employment generation, which increased by 37.66 per cent over the same period. The relatively higher growth in employment compared to the number of startups suggests a transition towards greater scalability and organisational maturity, with startups generating more jobs per enterprise. Another trend indicator is the sharp increase in idea-stage support, with the number of ideas funded from 400 in 2022 to 709 in 2023, reflecting a growth of 77.25 per cent, and remaining at that level in 2024. This pattern indicates a deliberate policy emphasis on strengthening early-stage innovation and building a robust pipeline for future startup creation rather than short-term expansion alone. Equity investment mobilised by Kerala-based startups increased from 4,300 crore in 2022 to 5,600 crore in 2024, showing a growth of 30.23 per cent. Though the pace of investment growth moderated in 2024, the sustained upward trend reflects growing investor confidence and the increasing credibility of startups emerging from the state's ecosystem.

C) Entrepreneurial Ecosystem in Kerala, 2025: A District Analysis

Table 4: District-wise distribution of IEDCs and Registered startups in Kerala, 2025

District	IEDC	Total IEDCs (%)	Registered Startups	Total startups (%)
Kasaragod	9	3.46	63	1.29
Kannur	14	5.38	210	4.29
Kozhikode	15	5.77	507	10.36
Wayanad	5	1.92	70	1.43
Malappuram	22	8.46	274	5.60
Thrissur	20	7.69	423	8.65
Palakkad	18	6.92	215	4.40
Ernakulam	51	19.62	1,896	38.78
Idukki	11	4.23	75	1.53
Kottayam	21	8.08	213	4.35
Alappuzha	7	2.69	148	3.03
Pathanamthitta	13	5.00	98	2.00
Kollam	23	8.85	228	4.66
Thiruvananthapuram	31	11.92	471	9.63

Source: *Website of KSUM*

The above table shows that Ernakulam is the major startup hub in Kerala. It accounts for 19.62% of Innovation and Entrepreneurship Development Centres (IEDCs) and nearly 38.78% of the state's registered startups. This concentration reflects a strong institutional base, high incubation capacity, better access to markets, mentorship networks, and industry linkages. Another interesting fact is that Thiruvananthapuram contributes about 11.92 per cent of IEDCs and 9.63 per cent of startups, and Thrissur, contributing 7.69 per cent of IEDCs and 8.65 per cent of startups, also emerges as an important secondary hub in Kerala. Another noteworthy point is that Kozhikode performs particularly well, and it records a higher share

of startups relative to its IEDC presence. Kollam and Kottayam also demonstrate a balanced relationship between ecosystem infrastructure and entrepreneurial activity. On the other hand, Wayanad and Idukki have very low shares of both IEDCs and startups. Kasaragod and Pathanamthitta also show limited startup activity in the state.

V. MAJOR FINDINGS OF THE STUDY

1. It is revealed that the number of startups supported under the KSUM increased from 300 in 2016 to 5,200 by March 2024. This sustained growth shows the effectiveness of KSUM in promoting startup formation, particularly in technology and knowledge-intensive sectors in Kerala.
2. It is found that employment generated increased sharply from 3,000 in 2016 to nearly 53,000 in 2024. The close alignment between startup growth and employment expansion, along with a high compound annual growth rate, shows the role of startups as a significant source of innovation-led entrepreneurship in Kerala.
3. It is also found that the number of ideas supported for entrepreneurship increased from just 20 in 2016 to 709 in 2024. This trend reflects KSUM's strong emphasis on ideation, early-stage innovation, and entrepreneurial intent, particularly among college students and first-time innovators with the help of IEDCs.
4. The increase in the number of Innovation and Entrepreneurship Development Centres from 80 to 425 during the study period signifies the institutionalisation of entrepreneurship education across the higher education sector in Kerala. The widespread presence of IEDCs has played a crucial role in creating an entrepreneurial culture at the grassroots level.
5. 5.It is also revealed that incubation infrastructure expanded substantially from 57,000 square feet in 2016 to nearly 8,00,000 square feet by 2024. During the period from 2022 to 2024, physical infrastructure levels remained largely unchanged, while startup formation and employment continued to increase. This shows improved utilisation of the existing facilities of Startup in Kerala.
6. Equity investment mobilisation increased sharply from ₹207 crore in 2016 to ₹5,600 crore in 2024, representing an increase of nearly twenty-seven times. This significant rise in equity investment indicates improvements in startup quality, stronger investor confidence, and increasing ecosystem maturity.
7. The result of the analysis shows that the startup ecosystem in Kerala shows regional disparities. Entrepreneurial activity is mainly concentrated in a few districts. Ernakulam alone contributes nearly 40 per cent of the total registered startups in the state. Though Innovation and Entrepreneurship Development Centres are spread across the state, their ability to generate startups differs significantly from one district to another. Thiruvananthapuram, Thrissur, and Kozhikode are gradually emerging as secondary startup hubs in Kerala. On the other hand, Wayanad, Idukki, Kasaragod, and Pathanamthitta remain at an early stage of startup growth. This recommends the need for region-specific policy measures, including startup ecosystem strengthening and investor outreach in backward regions.

VI. CONCLUSION

The present study provides a comprehensive evaluation of the performance of Kerala's startup ecosystem under the leadership of the Kerala Startup Mission during the period 2016-2024. The findings indicate that KSUM has successfully transitioned from a technology-focused incubator into a broad-based innovation governance institution, driving ecosystem-level development. Sustained growth in startup formation, employment generation, ideation support, institutional entrepreneurship, and investment mobilisation highlights the effectiveness of state-led policy interventions and coordinated support mechanisms in nurturing a dynamic and increasingly mature startup ecosystem in Kerala. It is suggested that the targeted policy interventions should focus on strengthening startup infrastructure, access to funding, and mentorship in underrepresented districts to ensure more balanced entrepreneurial growth across the state.

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