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Research Article

FUELLING INNOVATION: AN EMPIRICAL STUDY OF START-UP CHALLENGES IN KRISHNAGIRI

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Abstract

This study explores the emerging start-up ecosystem in Krishnagiri, Tamil Nadu, examining the critical challenges faced by entrepreneurs in the district. Situated in a strategic location with growing manufacturing and industrial potential, Krishnagiri is transitioning from a primarily agricultural economy to a diverse industrial hub. The study identifies key challenges, including access to funding, availability of skilled labour, supportive infrastructure, and government policies, and proposes actionable solutions to overcome these hurdles. By focusing on these areas, the paper aims to provide insights for fostering a sustainable and innovation-driven start-up ecosystem in Krishnagiri, contributing to the region's economic development.

Keywords: Krishnagiri, start-ups, entrepreneurship, industrialization, challenges, sustainable growth, government policies, skilled labour.

Introduction

Krishnagiri district, strategically located in Tamil Nadu and bordered by the states of Karnataka and Andhra Pradesh, is rapidly emerging as a vibrant hub for industrial and entrepreneurial growth. Traditionally known for its rich agricultural base, the district is now witnessing a transformative shift towards manufacturing and industrialization. With the advantages of geographical proximity to major economic centres and improving infrastructure, Krishnagiri is fostering a dynamic environment for startups. The rise in manufacturing units and the surge of innovative ventures are steadily positioning Krishnagiri as an upcoming industrial hub in South India. This promising ecosystem offers a fertile ground for new enterprises to flourish, making it a significant contributor to regional economic development. However, this promising ecosystem will flourish only if the current challenges faced by entrepreneurs are properly addressed. Understanding the real hurdles is crucial for sustaining and accelerating start-up growth in Krishnagiri. To support this objective, the present article identifies and analyses the most critical factors influencing startup success. By highlighting key challenges — such as access to funding, availability of skilled labour, mentorship opportunities, supportive infrastructure, and favourable government policies — the study aims to provide actionable insights that can ease

entrepreneurial growth and further strengthen Krishnagiri's emerging industrial landscape.

Key Challenges Identified: Access to Funding and Investment, Availability of Skilled Labour, Supportive Infrastructure, Level of Competition in the Startup Ecosystem, Favourable Government Policies, Perception of the Startup Ecosystem, Opportunities for Collaboration, Availability of Mentorship

Background of the Study

Startups are dynamic businesses focused on innovation and growth, typically built on new ideas and emerging technologies. The concept of startups gained momentum in the 20th century, especially in the United States with companies like Hewlett-Packard setting the stage for future tech-driven entrepreneurial ventures. Over time, the startup model spread across industries, becoming crucial to modern economies. In India, Krishnagiri, a district in Tamil Nadu, has evolved from an agricultural hub to a burgeoning industrial centre, attracting a wide range of startups and multinational corporations. With improving infrastructure, favourable government policies, and strategic geographic location, Krishnagiri has emerged as a prime location for investments in sectors like electric mobility, automobile manufacturing, and electronics. Notable companies such as Delta Electronics and Ola Electric have contributed significantly to the region's industrial development. Delta Electronics has been a key player in manufacturing products related to electric mobility and telecom. Similarly, Ola Electric's massive two-wheeler factory in Krishnagiri is the largest of its kind globally and signifies the district's growing importance in the electric vehicle market. TVS Motor Company, a leading automobile manufacturer established in 1992, also calls Krishnagiri home. The company has not only excelled in the production of motorcycles, bicycles, and scooters but has also actively engaged in Corporate Social Responsibility (CSR) activities. For instance, TVS launched a clean drinking water project for Hosur Municipality and initiated a rural education development program to support underprivileged communities. With a global presence, TVS continues to be a major contributor to the district's industrial growth. The district is further enhancing its startup ecosystem through initiatives like "Coffee with Collector," which encourages dialogue between entrepreneurs, startups, and local government officials. This initiative fosters collaboration, enabling businesses to discuss opportunities, challenges, and solutions with the District Collector and other government representatives. This study aims to examine the start-up ecosystem in Krishnagiri, identifying key factors such as funding access, skilled labour availability, infrastructure, and government

support that impact the success of startups. By highlighting the success stories of companies like Delta Electronics, Ola Electric, and TVS Motor Company, as well as government-led initiatives, the research seeks to understand how Krishnagiri is positioned as a promising industrial hub in South India.

Review of Literature

Recent studies emphasize the growing significance of sustainable practices in agriculture, particularly in rural areas like Krishnagiri. Venkatesh & Ravi (2020) highlight the critical lack of mentorship and business advisory services for rural start-ups, suggesting that expanding such services could enhance entrepreneurial growth and sustainability. Kumar & Rani (2019) focus on technological innovations, such as drip irrigation and smart farming, designed to tackle environmental challenges like water scarcity while improving crop productivity and sustainability. These innovations are seen as key drivers of the region's shift towards more efficient and sustainable farming practices. Additionally, Venkatesh & Kumar (2023) argue that eco-friendly agriculture, including the adoption of organic farming, waste management, and renewable energy sources, is central to ensuring long-term agricultural sustainability. They note that these sustainable practices are essential for meeting growing environmental concerns and addressing the global demand for eco-friendly products. The trend is further supported by Kumar & Venkatesh (2018), who suggest that the increasing access to digital platforms and successful entrepreneurial examples is transforming the entrepreneurial mindset in rural communities, making them more open to innovative ventures. Furthermore, Venkatesh (2024) underlines the growing embrace of environmentally responsible practices by Krishnagiri's start-up ecosystem, highlighting innovations like organic fertilizers and biodegradable packaging aimed at reducing environmental impacts while responding to the demand for sustainable agricultural goods. These studies collectively point to a broader, systemic shift toward sustainable agricultural practices, driven by technological innovations, mentorship expansion, and changing mindsets in rural India.

In addition, Srinivasan (2016) notes the importance of vocational training programs tailored to emerging industries, such as IT and digital marketing, to close skill gaps and support rural entrepreneurship. While these studies mainly focus on Krishnagiri's agricultural ecosystem, they reflect a wider global trend towards sustainable farming and entrepreneurship, suggesting that the lessons learned in this region could apply to broader contexts where similar challenges and opportunities exist. This shift not only contributes to environmental conservation but also opens up new market opportunities, fostering the growth of sustainable

industries.

The research gap lies in understanding the localized challenges and opportunities unique to Krishnagiri's start up ecosystem. Further research addressing these gaps can provide a more comprehensive framework for supporting the growth of startups in the region and contribute to the broader discourse on rural entrepreneurship and industrialization.

Methodology

The research adopts a mixed-methods approach, combining qualitative interviews with local entrepreneurs and quantitative data from Krishnagiri's industrial and agricultural sectors. This approach allows for a comprehensive analysis of the startup ecosystem and an in-depth understanding of the challenges faced by entrepreneurs in the region.

Sources of information

Objective: To identify and analyse the major challenges faced by start-ups in Krishnagiri.

Data Collection: Primary data collected through structured questionnaires.

Sample Size: Data was collected through interviews with 30 start-up founders across different industries, supplemented by a survey of 100 local businesses.

Analysis Technique: Principal Component Analysis (PCA) was applied to identify major factors influencing start up challenges.

Software Used: SPSS

Results and Discussion

Communalities

The communalities indicate how much variance in each variable is explained by the extracted components. In this study, the communalities for the ten variables range from **52.6% to 71.1%**, signifying that the factor analysis model provides a reasonably good explanation of the data.

Communalities

	Initial	Extraction
Biggest start-ups challenges in Krishnagiri	1.000	.526
Availability of skilled labour 1-5	1.000	.682
Difficulty in obtaining funding investment	1.000	.700
Supportive infrastructure for start-ups	1.000	.597
Level of competition in start-up ecosystem	1.000	.680
Sector with most start-up potential	1.000	.589
Favourability of government policies	1.000	.628
Perception of start-up ecosystem	1.000	.668
Opportunities for collaboration	1.000	.710
Availability of mentorship	1.000	.711

Extraction Method: Principal Component Analysis.

Total Variance Explained

Using **Principal Component Analysis (PCA)**, five components with eigenvalues greater than 1 were extracted. Collectively, these five components explain **64.92%** of the total variance, which is considered a satisfactory level of explanatory power in social science research.

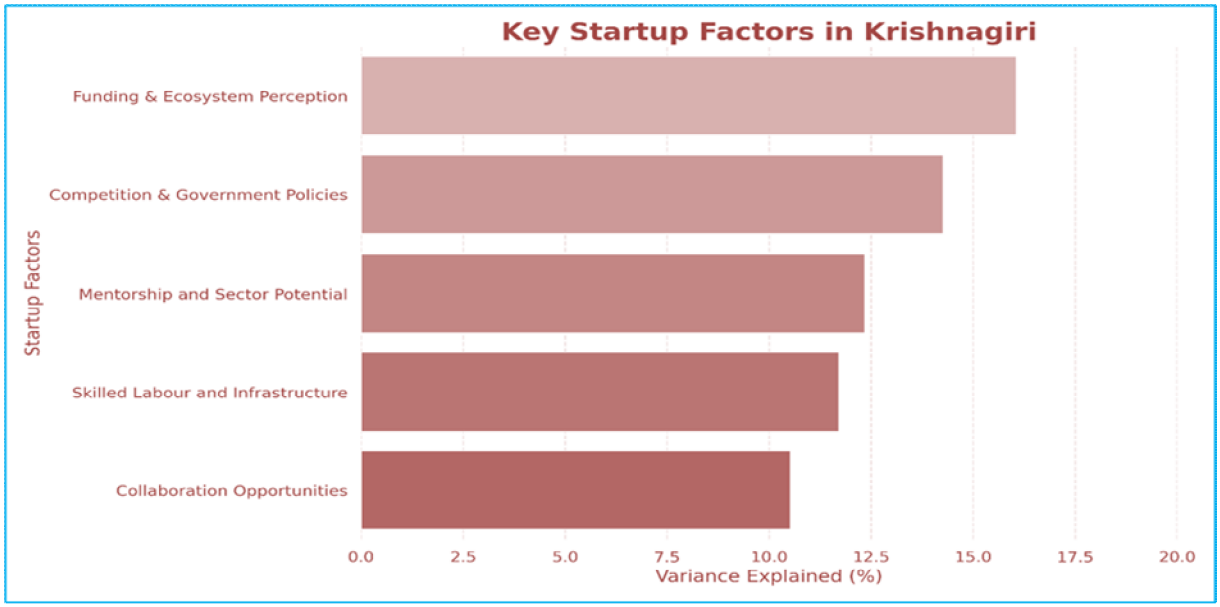
Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.606	16.063	16.063	1.606	16.063	16.063	1.367	13.673	13.673
2	1.427	14.267	30.330	1.427	14.267	30.330	1.307	13.071	26.744
3	1.235	12.346	42.675	1.235	12.346	42.675	1.304	13.036	39.780
4	1.172	11.715	54.391	1.172	11.715	54.391	1.288	12.879	52.658
5	1.052	10.524	64.915	1.052	10.524	64.915	1.226	12.257	64.915
6	.868	8.680	73.596						
7	.808	8.082	81.677						
8	.743	7.433	89.110						
9	.586	5.857	94.967						
10	.503	5.033	100.000						

Extraction Method: Principal Component Analysis.

Key Factors Identified

The rotated component matrix revealed five major underlying factors influencing the growth of start-ups in Krishnagiri. Each factor represents a group of interrelated variables contributing to specific aspects of the start-up ecosystem.



Rotated Component Matrix (Varimax Rotation)

Variable	Component 1 (Funding & Ecosystem Perception)	Component 2 (Competition & Government Policies)	Component 3 (Mentorship & Sector Potential)	Component 4 (Skilled Labour & Infrastructure)	Component 5 (Collaboration Opportunities)
Difficulty in obtaining funding	0.728	0.008	-0.257	-0.043	0.318
Perception of start-up ecosystem	0.765	0.170	0.131	0.048	-0.185
Favourability of government policies	0.118	0.710	0.083	0.279	-0.159
Level of competition in start-up ecosystem	0.080	0.757	-0.047	-0.277	0.146
Availability of mentorship	0.413	-0.063	0.663	-0.045	-0.308
Sector with most start-up potential	0.138	-0.001	-0.738	0.014	-0.161
Availability of skilled labour	-0.075	0.145	-0.023	0.757	-0.287
Supportive infrastructure	0.147	-0.311	0.024	0.634	0.276
Opportunities for collaboration	0.006	-0.002	0.093	-0.041	0.837
Biggest start-up challenges in Krishnagiri	-0.121	0.281	0.467	0.388	0.253

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
Note: Rotation converged in 12 iterations.

Factor Groupings

Component	Label	Variables Included
1	Funding & Ecosystem Perception	Difficulty in obtaining funding, Perception of start-up ecosystem
2	Competition & Government Policies	Favourability of government policies, Level of competition
3	Mentorship & Sector Potential	Availability of mentorship, Sector with most start-up potential
4	Skilled Labour & Infrastructure	Availability of skilled labour, Supportive infrastructure
5	Collaboration Opportunities	Opportunities for collaboration

Factor 1: Funding & Ecosystem Perception

- Difficulty in obtaining funding

- General perception of the start-up ecosystem

This factor highlights the significance of access to capital and how the ecosystem's overall reputation affects entrepreneurial motivation and investor confidence.

Factor 2: Competition & Government Policies

- Level of competition in the start-up space
- Favourability of government policies

This reflects the competitive pressure start-ups face and the crucial role of supportive regulatory frameworks in nurturing new ventures.

Factor 3: Mentorship and Sector Potential

- Availability of mentorship
- Sector with the most start-up potential

This factor emphasizes the value of guidance from experienced professionals and the strategic importance of choosing high-potential sectors.

Factor 4: Skilled Labour and Infrastructure

- Availability of skilled labour
- Supportive infrastructure for start-ups

This group of variables underlines operational concerns like workforce availability and physical infrastructure, which are essential for business scalability.

Factor 5: Collaboration Opportunity

- Opportunities for collaboration

This final factor stands out independently, underscoring how crucial partnerships, networking, and collaborative ecosystems are for sustained growth.

Conclusion

This study provides a comprehensive understanding of the key factors influencing the growth and sustainability of startups in Krishnagiri, a district undergoing rapid industrial transformation. Through Principal Component Analysis, five critical dimensions were identified—namely, funding and ecosystem perception, competition and government policies, mentorship and sector potential, skilled labour and infrastructure, and collaboration opportunities.

Among these, securing adequate funding emerged as the most significant challenge, often constraining startups from scaling effectively. The shortage of skilled labour and infrastructural limitations further pose operational challenges, while the evolving policy environment and limited mentorship avenues continue to impact entrepreneurial momentum.

In addition, the lack of structured platforms for collaboration hampers the ecosystem's ability to foster innovation through shared resources and networks.

To ensure the sustained development of Krishnagiri's startup ecosystem, a multi-pronged policy approach is imperative. This includes expanding access to finance, investing in workforce development, enhancing infrastructure, strengthening mentorship programs, and encouraging cross-sector collaboration. These strategic interventions can not only support existing ventures but also attract new entrepreneurial initiatives, positioning Krishnagiri as a dynamic, innovation-led industrial hub in South India.

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