

FUNDING STRATEGIES OF START-UPS IN KERALA

Thesis

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DOCTOR OF PHILOSOPHY IN COMMERCE

By

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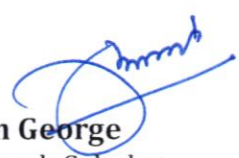


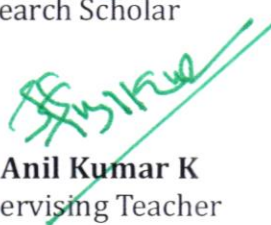
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ABBREVIATIONS

AIFs	: Alternative Investment Funds
ANOVA	: Analysis of Variance
ATL	: Atal Tinkering Lab
BHASKAR	: Bharat Start-up Knowledge Access Registry
BIRAC	: Biotechnology Industry Research and Assistance Council
BTIC	: Biotechnology Incubation Centre
CGSS	: Credit Guarantee Scheme for Start-ups
CGTMSE	: Credit Guarantee Fund Trust for Micro and Small Enterprises
CSR	: Corporate Social Responsibility
DPIIT	: The Department for Promotion of Industry and Internal Trade
DST	: Department of Science and Technology
EDPs	: Entrepreneurship Development Programmes
ESG	: Environmental, Social and Governance,
EU	: European Union
EV	: Electric Vehicle
FEMA	: Foreign Exchange Management Act
FFS	: Fund of Funds for Start-ups
FLGD	: First Loss Default Guarantee
GSER	: Global Start-up Ecosystem Report
GST	: Goods and Services Tax
IAN	: Indian Angel Network
ICAR	: Indian Council of Agricultural Research

IDT	: Innovation Diffusion Theory
IEDCs	: Innovation and Entrepreneurship Development Cells
IoT	: Internet of Things
IP	: intellectual property
IPO	: Initial Public Offering
IRR	: Internal Rate of Return
KFC	: Keral Financial Corporation
K-FON	: Kerala Fibre Optic Network
KIIFB	: Kerala Infrastructure Investment Fund Board
KSFE	: Kerala State Financial Enterprises
KSIDC	: Kerala State Industrial Development Corporation
KSIF	: Kerala Start-up Investment Fund
KSUM	: Kerala Start-up Mission
K-WISE	: Kerala Women in Start-up Ecosystem
LEAP	: Leadership for Academicians Programme
MLM	: Multinomial Logit Model
MSH	: MeitY Start-up Hub
MSME	: Micro, Small and Medium Enterprises
MVP	: Minimum Viable Product
NBFCs	: Non-Banking Financial Company
NRI	: Non-resident Indian
OECD	: Occupational Economic Co-operation and Development
OMLM	: Ordered Multinomial Logit Model
OR	: Odds Ratio
PMMY	: Pradhan Mantri Mudra Yojana
POT	: Pecking Order Theory
PPPs	: public-private partnerships

RBV	: Resource-Based View
SDPK	: Skill Delivery Platform Kerala
SEBI	: Securities Exchange Board of India
SIDBI	: Small Industries Development Bank of India
SISFS	: Start-up India Seed Fund Scheme
SVEP	: Start-up Village Entrepreneurship Programme
TBI	: Technology Business Incubator
UNCITRAL	: United Nations Commission on International Trade Law
VC	: Venture Capital
VRIN	: Inimitable And Non-Substitutable
WIPO	: World Intellectual Property Organisation
YIP	: Young Innovators Programme

Abstract

The emergence of Start-ups has redefined global entrepreneurship by fostering innovation, job creation and economic dynamism. In India, particularly in Kerala, Start-ups have evolved as critical agents of technological and social transformation. Despite supportive state policies and initiatives under the Kerala Startup Mission (KSUM), many Start-ups continue to struggle with financial access, inadequate awareness of funding options and limited strategic management of financial resources. This study, entitled “*Funding Strategies of Start-ups in Kerala*,” examines how entrepreneurs in the state access, select and utilise various sources of finance to support growth and innovation of industries. It also analyses the choice of selecting funding strategies of Start-ups, evaluates their level of satisfaction towards Start-up finance and investigates the risks associated with availing different sources of Start-up finance.

The research is descriptive and inferential in nature, focusing on Start-ups registered under KSUM. Using both primary and secondary data, the study investigates three key dimensions (i) The initiatives of Govt. of Kerala in providing financial and other facilities for promoting Start-ups, (ii) the choice of selecting funding strategies towards Start-up finance, (iii) the level of satisfaction of entrepreneurs towards Start-up finance and (iv) the multifaceted risks of availing Start-up funding. A structured questionnaire was administered to a randomly selected sample of 357 Start-ups drawn from the population of 4891 Start-ups registered in the state. The study employed statistical tools such as reliability analysis, descriptive statistics and hypothesis testing to validate findings.

Even though people have sufficient awareness about different funding schemes of both government and other alternative sources, significant challenges remain regarding their accessibility, cost of capital and procedural delays. Entrepreneurs show moderate satisfaction with existing funding avenues, citing the need for more flexible, transparent and timely disbursement mechanisms. Financial and regulatory risks are found to be the most critical barriers to the effective utilisation of funds. The study underscores the importance of integrated financial literacy programs, simplified policy frameworks and diversified funding models such as crowdfunding and revenue-based financing.

The findings are expected to aid policymakers, financial institutions and incubators in designing evidence-based interventions to strengthen the Kerala’s Start-up ecosystem of Kerala. By aligning funding mechanisms with the needs of entrepreneurs’, the state can enhance Start-up sustainability, innovation and long-term competitiveness.

Keywords: Start-ups, Funding Strategies, Entrepreneur Satisfaction, Financial Risks, Kerala Startup Mission, Government Initiatives.

സംഗ്രഹം

നവീന ആശയങ്ങൾ പ്രാവർത്തികമാക്കുന്നതിലൂടെയും തൊഴിലവസരങ്ങൾ സൃഷ്ടിക്കുന്നതിലൂടെയും ആഗോളതലത്തിൽ സംരംഭകത്വ മേഖലയ്ക്ക് പുതിയൊരു മുഖം നൽകാൻ സ്റ്റാർട്ടപ്പുകൾക്ക് കഴിഞ്ഞിട്ടുണ്ട്. ഇന്ത്യയിൽ, പ്രത്യേകിച്ച് കേരളത്തിൽ, സാങ്കേതികവും സാമൂഹികവുമായ മാറ്റങ്ങളുടെ ചാലകശക്തിയായി സ്റ്റാർട്ടപ്പുകൾ വളർന്നു വരുന്നു. കേരള സ്റ്റാർട്ടപ്പ് മിഷന്റെ (KSUM) കീഴിലുള്ള വിവിധ സർക്കാർ പദ്ധതികളും പിന്തുണയും നിലനിൽക്കുമ്പോഴും, സാമ്പത്തിക സ്രോതസ്സുകളുടെ അഭാവം, ഫണ്ടിംഗ് രീതികളെക്കുറിച്ചുള്ള അറിവില്ലായ്മ, സാമ്പത്തിക വിഭവങ്ങളുടെ കാര്യക്ഷമമല്ലാത്ത വിനിയോഗം എന്നിവ സ്റ്റാർട്ടപ്പുകൾ നേരിടുന്ന പ്രധാന വെല്ലുവിളികളാണ്.

‘കേരളത്തിലെ സ്റ്റാർട്ടപ്പുകളുടെ ഫണ്ടിംഗ് സ്ട്രാറ്റജിസ്’ എന്ന ഈ പഠനം, സംരംഭകർ എങ്ങനെ തങ്ങളുടെ ബിസിനസ് വളർച്ചയ്ക്കായി മൂലധനം കണ്ടെത്തുന്നുവെന്നും അത് എങ്ങനെ വിനിയോഗിക്കുന്നുവെന്നും പരിശോധിക്കുന്നു. വിവിധ ഫണ്ടിംഗ് രീതികളുടെ തിരഞ്ഞെടുപ്പ്, സാമ്പത്തിക സഹായങ്ങളിലുള്ള സംരംഭകരുടെ സംതൃപ്തി, ഫണ്ടിംഗ് സ്വീകരിക്കുമ്പോൾ നേരിടുന്ന റിസ്കുകൾ എന്നിവയും ഈ പഠനത്തിൽ വിശകലനം ചെയ്യുന്നുണ്ട്.

KSUM-ൽ രജിസ്റ്റർ ചെയ്ത സ്റ്റാർട്ടപ്പുകളെ കേന്ദ്രീകരിച്ചാണ് ഈ പഠനം നടത്തിയത്. കേരളത്തിലെ 4,891 രജിസ്റ്റർ ചെയ്ത സ്റ്റാർട്ടപ്പുകളിൽ നിന്ന് തിരഞ്ഞെടുത്ത 357 സ്റ്റാർട്ടപ്പുകളിൽ ചോദ്യസൂചിക ഉപയോഗിച്ച് വിവരശേഖരണം നടത്തി. പ്രധാനമായും താഴെ പറയുന്ന നാല് കാര്യങ്ങളാണ് പഠനവിധേയമാക്കിയത്:

- സ്റ്റാർട്ടപ്പുകളെ പ്രോത്സാഹിപ്പിക്കുന്നതിനായുള്ള കേരള സർക്കാരിന്റെ സാമ്പത്തികവും അല്ലാത്തതുമായ പദ്ധതികൾ.
- സ്റ്റാർട്ടപ്പുകൾ തിരഞ്ഞെടുക്കുന്ന വിവിധ ഫണ്ടിംഗ് രീതികൾ.
- ഫണ്ടിംഗ് ലഭ്യതയിൽ സംരംഭകർക്കുള്ള സംതൃപ്തിയുടെ അളവ്.
- ഫണ്ടിംഗ് സ്വീകരിക്കുന്നതിലെ വിവിധ റിസ്കുകൾ.

കണ്ടെത്തലുകൾ

സർക്കാർ പദ്ധതികളെയും മറ്റ് ഫണ്ടിംഗ് രീതികളെയും കുറിച്ചുള്ള അവബോധം വർദ്ധിച്ചിട്ടുണ്ടെങ്കിലും, ഫണ്ട് ലഭിക്കുന്നതിലെ നൂലാമാലകൾ, ഉയർന്ന മൂലധനച്ചെലവ്, കാലതാമസം എന്നിവ ഇപ്പോഴും വലിയ തടസ്സങ്ങളായി തുടരുന്നു. നിലവിലെ സാമ്പത്തിക സഹായങ്ങളിൽ സംരംഭകർ മിതമായ സംതൃപ്തിയാണ് പ്രകടിപ്പിക്കുന്നത്. കൂടുതൽ സുതാര്യവും വേഗത്തിലുള്ളതുമായ ഫണ്ട് വിതരണ സംവിധാനം വേണമെന്ന് അവർ ആഗ്രഹിക്കുന്നു. സാമ്പത്തികവും നിയമപരവുമായ വെല്ലുവിളികളാണ് ഫണ്ട് വിനിയോഗത്തിൽ ഏറ്റവും വലിയ തടസ്സമായി കാണുന്നത്.

ധനകാര്യ സാക്ഷരതാ ക്ലാസുകൾ ലഭ്യമായ നയരൂപീകരണങ്ങൾ, ക്രൗഡ് ഫണ്ടിംഗ് പോലുള്ള പുതിയ ഫണ്ടിംഗ് രീതികൾ എന്നിവയുടെ പ്രാധാന്യം ഈ പഠനം എടുത്തുപറയുന്നു. നയരൂപകർത്താക്കൾക്കും സാമ്പത്തിക സ്ഥാപനങ്ങൾക്കും ഇൻകുബേറ്ററുകൾക്കും കേരളത്തിലെ സ്റ്റാർട്ടപ്പ് രംഗം ശക്തിപ്പെടുത്തുന്നതിന് ആവശ്യമായ മാറ്റങ്ങൾ വരുത്താൻ ഈ പഠനം സഹായകമാകും.

കീവേഡുകൾ: സ്റ്റാർട്ടപ്പുകൾ, ഫണ്ടിംഗ് രീതികൾ, സംരംഭകരുടെ സംതൃപ്തി, സാമ്പത്തിക റിസ്കുകൾ, കേരള സ്റ്റാർട്ടപ്പ് മിഷൻ, സർക്കാർ പദ്ധതികൾ.

Chapter 1

INTRODUCTION

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1.1 INTRODUCTION

Start-ups are the souls of innovation and entrepreneurship. They are young business ventures created to develop new products, services or processes that address problems in new and efficient ways. Unlike traditional businesses, start-ups aim for scalability, rapid growth and high impact often with limited resources. Start-ups received significant policy support and are now considered to be the primary factor of economic growth, creation of employment and technological development. Start-ups are the fledgling ventures which are established on scientific breakthrough, risk-taking and scalability. They develop new products or services in order to find new ways of solving problems and tend to penetrate the already existing markets. Key attributes include adaptability to changing market conditions, technology adoption like AI and digital platforms and customer-focused approach so that solutions are developed based on the needs of the users. They feed off networking and working with investors, accelerators and entrepreneurs globally.

The Start-up ecosystem has become the engine of innovation, economic development and societal transformation, going across the national borders to provide new opportunities in nearly every part of the globe. Since the Silicon culture was the first to establish itself in the West, Start-up activity became the measure of technological and entrepreneurial vitality, escaping the conventional epicentres of the United States and Western Europe. In 2024, the largest amount of finance spent on technology companies was recorded at 337 billion, the third largest ever on record in the face of economic instability and the continued impacts of increased interest rates and liquidity disruptions. The landscape has, however, not been universally buoyant since the manic heights of 2021, with the world funding drying up as 2022 and 2023 saw crunch base registering a five years low of \$285 billion in Start-up investment, a 38% decline

in previous year. The contraction of funds was a mirror of the generalised exercise of caution among venture capitalists, so the number of financing rounds in all parts of the world fell by 25.9% between Q1 and Q3 in 2024, with significant reductions in the number of deals and the amount of investments in North America, Europe and Asia. However, there are still spots of strength and robust forward movement early-stage investments in generative AI and cleantech are the highest priorities, with 30 and 15 percent respectively of the global VC financing, in 2023. Southeast Asian, Eastern European and Latin American new innovation hubs witnessed a 25 percent increase of capital investment, both due to local governmental encouragement and foreign fascination with frontier technologies and digital solutions.

In the world grappling with data privacy and AI ethics regulation, generative AI and climate tech leaders are the new generation of global scale-ups, as the ecosystem evolves to meet new demands, risk tolerance and access to capital in the post-pandemic world. This interactive and ever-linked global Start-up environment preconditions the localised approach to innovation and funding in India which has some lessons and opportunities to offer to those willing to trigger sustainable entrepreneurship and high-impact business. Start-ups development in India is an amazing process characterised by a high rate of evolution and dynamic policy development that significantly boosted the country to be the 3rd largest Start-up ecosystem in the world (in 2025). The first can be traced to the technology-based Entrepreneurial boom of the late 1990s and early 2000s, where companies such as Infosys and Naukri.com first set forth the trail of disruptive business model. A large turning point occurred in August 2015, when Prime Minister Narendra Modi unveiled the Start-up India drive, which officially began in January 2016 and is intended to offer tax breaks, harmless regulatory standards and financing amenities under schemes like the Fund of Funds for Start-ups (FFS) and the Start-up India Seed Fund Scheme. This catalysed the development of spectacular ecosystems the number of DPIIT-recognised Start-ups had soared to 1.59 lakh in January 2025, with Bengaluru, Mumbai, Hyderabad and Delhi-NCR being smaller cities also became key innovation centres. Labour and environment compliance self-certification, market access, incubation and direct seed funding policies have so far helped to create over 16.6 lakh

jobs since 2016, and over 73,000 Start-ups have been opened with at least one woman director upto October 2024. Start-up development in India has grown substantially on a state scale since the introduction of Start-up India initiative in 2016 which was intended to establish a strong ecosystem to create jobs, innovate and be an entrepreneur. States have developed their policies that are aimed at local sectors, incubation programmes, market access and regulatory support.

Kerala, in the Malabar coast in India, is one of the fastest growing and non-discriminative Start-up hubs with the Kerala Start-up Mission (KSUM) being instituted in 2016 to foster entrepreneurship in both urban and rural regions. Kerala has been in the frontline to promote and develop entrepreneurship. The Department for Promotion of Industry and Internal Trade (DPIIT) has acclaimed its clear Start-up policy and regulatory framework and its structured Start-up environment. Kerala is the only state to save 1 percent of annual budget to support initiatives that promote entrepreneurship. The state has over 63 incubators, 6,500 registered Start-ups and more than 530 Innovation and Entrepreneurship Development Cells (IEDCs) and various fab labs in 2025. Cumulative funding in the form of \$665 million supported the 147 percent increase in the value of the ecosystem between 2021 and 2023 to reach a total of 1.7 billion. This has generated employment to more than 65, 000 people and 100, 000 students are involved every year.

It has a central accelerator in the Kerala Start-up Mission, Thiruvananthapuram and other support facilities in Technology Innovation Zone of KINFRA Hi-Tech Park, Kochi and UL Cyberpark, Calicut, to support technology-oriented ventures. Incubation facilities are provided in Maker Village in Kochi as well as NRITBI at Infopark, Kochi and at the Biotechnology Incubation Centre (BTIC) in Kochi. All these accelerators and incubators together offer mentoring, infrastructure and resources to support Start-ups and promote innovation in the state of Kerala. Kerala Technology Innovation Zone and Maker Village, located in Ernakulam has almost 1,900 Start-ups and the Technopark based in Thiruvananthapuram has approximately 470 Start-ups. Kozhikode and Thrissur have a little over 400 Start-ups each Kottayam, Malappuram, Kannur and Palakkad have moderate number of start-ups. Wayanad and

Kasaragod are disadvantaged because of the lack of infrastructure and funding. Kerala specialises in IT/ITES, AI, robotics, healthcare, Agritech and tourism-tech and has some key projects such as SurveySparrow, Sastra Robotics, Genrobotics and Netrasemi. Infra is also enhanced through flagship programs like Electric Vehicle Manufacturing Parks and AI Conclaves in Kochi. Kerala has been established as a national hub of technology-driven, socially inclusive entrepreneurship by acting as a national hub through Global Capability Centres and angel networks in Kochi and Thiruvananthapuram.

1.2 NEED AND SIGNIFICANCE OF THE STUDY

The state of Kerala has witnessed the emergence of a vibrant entrepreneurial environment over the past decade, marked by a steady increase in Start-up ventures across diverse sectors. Despite this encouraging growth, access to suitable and timely funding remains one of the most critical challenges in determining the success, sustainability and scalability of these ventures. Start-ups, by their very nature, operate in an environment of uncertainty, innovation and risk-taking. For them, financing is not merely about meeting immediate operational needs; it is equally about ensuring long-term sustainability, expanding into new markets and sustaining competitiveness in an increasingly dynamic business landscape.

Funding strategies adopted by Start-ups, therefore, represent a crucial area of inquiry, as inadequate or inappropriate financing often leads to stunted growth, constrained innovation and limited market penetration. Although Kerala provides a supportive ecosystem through government initiatives, incubators, accelerators and the presence of venture capital and angel investment networks, Start-ups continue to face significant hurdles in navigating multiple sources of finance, managing associated risks and optimising scarce resources. Seed funding plays a vital role in validating innovative ideas, but the availability of growth capital is equally essential to enable scaling, diversification and competitive advantage.

A major gap in the existing literature concerns how Start-ups in Kerala choose, combine and manage their financing strategies. Understanding this process is

particularly important because financial decision-making in the early stages often determines long-term sustainability. Addressing this knowledge gap has significant implications not only for entrepreneurs but also for policymakers, financial institutions and support organisations.

The findings of this study can be used by policy makers to design more targeted schemes and to refine existing policies for enhancing Start-up ecosystem in Kerala by offering evidence-based insights into funding practices and risk management strategies. The lending institutions can develop tailored financial products for Start-ups incubators and accelerators can provide more focused mentorship and resource support. The entrepreneurs are likely to benefit by gaining a clearer understanding about the effective leveraging of government grants, venture capital, angel investments and alternative financing models such as crowdfunding or revenue-based financing. In this context, the study is timely and significant in strengthening the Start-up ecosystem of Kerala thereby fostering innovation, competitiveness and sustainable economic growth.

1.3 SCOPE OF THE STUDY

The present study was based on the funding strategies of Start-ups in Kerala specifically those registered under the Kerala Start-up Mission (KSUM). The study was limited in scope to registered Start-ups operating within the state ensuring data accuracy, authenticity and relevance to the formal entrepreneurial ecosystem of Kerala. Each Start-up was treated as a single analytical unit where the founders or co-founders acted as the respondents. The geographical area is limited to Kerala and it indicates the peculiarities of policy framework, institutional base and finance environment developed through KSUM initiatives. The study was based on a randomly selected sample representing the population. The research will produce information that is relevant in the entrepreneurial environment of Kerala because it will entail analysing the funding decisions, satisfaction and risks that are encountered in the Start-up funding of registered Start-ups. These boundaries give this research an insight into the funding strategies and institutional support mechanisms and challenges to the sustainability and growth of the Kerala Start-up ecosystem.

1.4 STATEMENT OF PROBLEM

Start-ups have become a vital component of economic growth, innovation and employment generation worldwide and Kerala is no exception. During the past decade, the state of Kerala witnessed a significant rise in entrepreneurial ventures due to the availability of skilled workforce, high literacy rates and supportive government policies. Despite the favorable environment, Start-ups faced critical challenges related to funding right from the beginning which directly affected their ability to launch, operate and scale sustainably. The problem is multifaceted, encompassing issues of financial access, strategic decision-making, risk management and satisfaction with available support systems.

One of the major problems is the limited access to and utilisation of government initiatives designed to support Start-ups. The programmes initiated by the Kerala Start-up Mission (KSUM), state financial agencies and other government departments offer seed funding, innovation grants, incubation facilities and mentoring support. Despite these resources, many entrepreneurs are either unaware of these programmes or find the application and approval processes cumbersome. The gap results in underutilisation of financial support, forcing Start-ups to depend on informal loans or high-interest debt, which can jeopardise their sustainability and growth. Another critical problem is the difficulty in selecting appropriate funding strategies. Entrepreneurs must decide between equity funding, bank loans, venture capital, angel investors or a combination of these options. It could be observed that most of the entrepreneurs lack adequate guidance or expertise to evaluate these options effectively. Poor funding decisions can lead to insufficient capital, high repayment burdens or loss of ownership control affecting long-term viability.

Start-ups in Kerala also face challenges related to the timeliness and adequacy of funding. Delays in disbursement, stringent eligibility criteria and limited funding amounts often prevent Start-ups from responding quickly to market opportunities. These constraints, combined with operational risks, regulatory compliance issues and market uncertainties, create a high-risk environment for emerging businesses. There was limited understanding of entrepreneurs' satisfaction levels with the funding and

support they received. It is unclear whether the financial schemes and institutional support adequately meet the specific needs of Start-ups in Kerala, particularly in terms of flexibility, accessibility and impact on business growth.

In this study, an attempt is made to examine the funding strategies of Start-ups in Kerala, with a view to providing a comprehensive understanding of how entrepreneurs access, utilise and manage financial resources. The study also aims to analyse the effectiveness of government initiatives, private funding options and institutional support mechanisms to yield insights into the gaps and challenges faced by Start-ups in securing timely and adequate finance. It also explores the decision-making process of entrepreneurs in selecting appropriate funding strategies and assesses their level of satisfaction with the financial support received. The Identification of risks and constraints associated with Start-up funding would be helpful to throw light on the critical areas where interventions are necessary such as: improving awareness of government schemes, simplifying application processes and designing flexible financing models that align with the needs of early-stage ventures. The findings of the study can be used by policymakers, financial institutions and Start-up incubators to provide evidence-based recommendations to enhance funding accessibility and their effectiveness. The entrepreneurs will gain practical insights into optimising their financial strategies, reducing risks and improving sustainability and growth prospects. The study aims to strengthen Kerala's Start-up ecosystem by creating a more supportive financial environment, fostering innovation and encouraging entrepreneurship.

1.5 RESEARCH QUESTIONS

1. What are the specific financial schemes, grants and institutional support mechanisms introduced by the Government of Kerala to strengthen the Start-up ecosystem?
2. How do Start-up entrepreneurs in Kerala determine their funding strategies and what are the internal and external factors that influence these decisions?

3. To what extent the entrepreneurs in Kerala are satisfied with the adequacy, accessibility and timeliness of financial support received from government and private sources?
4. What are the major financial, regulatory, market, investor-related and operational risks faced by Start-ups in Kerala while availing funding opportunities?
5. In what ways can government initiatives, funding structures and institutional support mechanisms be improved to enhance the long-term sustainability and growth of Start-ups in Kerala?

1.6 OBJECTIVES OF THE STUDY

1. To examine the various initiatives of the government of Kerala in providing financial and other facilities for promoting Start-ups.
2. To analyse the choice of selecting funding strategies in Start-ups.
3. To study the level of satisfaction of entrepreneurs towards Start-up Finance.
4. To analyse the multifaceted risks of availing Start-up funding in Kerala.

1.7 HYPOTHESES OF THE STUDY

1. H₀: There is no significant relationship between the choice of selecting funding strategies and Awareness and knowledge of available funding options, Financial considerations and the cost of capital, Risk tolerance and control over business operations, Accessibility and availability of funding sources, Impact on business growth and sustainability and External influences and strategic considerations.
2. H₂: There is a significant relationship between the choice of selecting funding strategies and Awareness and knowledge of available funding options, Financial considerations and the cost of capital, Risk tolerance and control over business operations, Accessibility and availability of funding sources, Impact on business growth and sustainability and External influences and strategic considerations.

3. H_0 : The satisfaction of entrepreneurs towards Start-up finance is not significantly related to the variability of funding options, ease of access to finance, cost and affordability of funding, government policy and support, and impact of funding on business growth.
4. H_1 : The satisfaction of entrepreneurs towards Start-up finance is significantly related to the variability of funding options, ease of access to finance, cost and affordability of funding, government policy and support, and the impact of funding on business growth.
5. H_0 : There is no significant difference in the perception of entrepreneurs about financial, regulatory compliance, market economic, investor and lender, operational and management risks for availing Start-up finance.
6. H_1 : There is a significant difference in the perception of entrepreneurs about financial, regulatory compliance, market economic, investor and lender, operational and management risks for availing Start-up finance.

1.8 OPERATIONAL DEFINITIONS

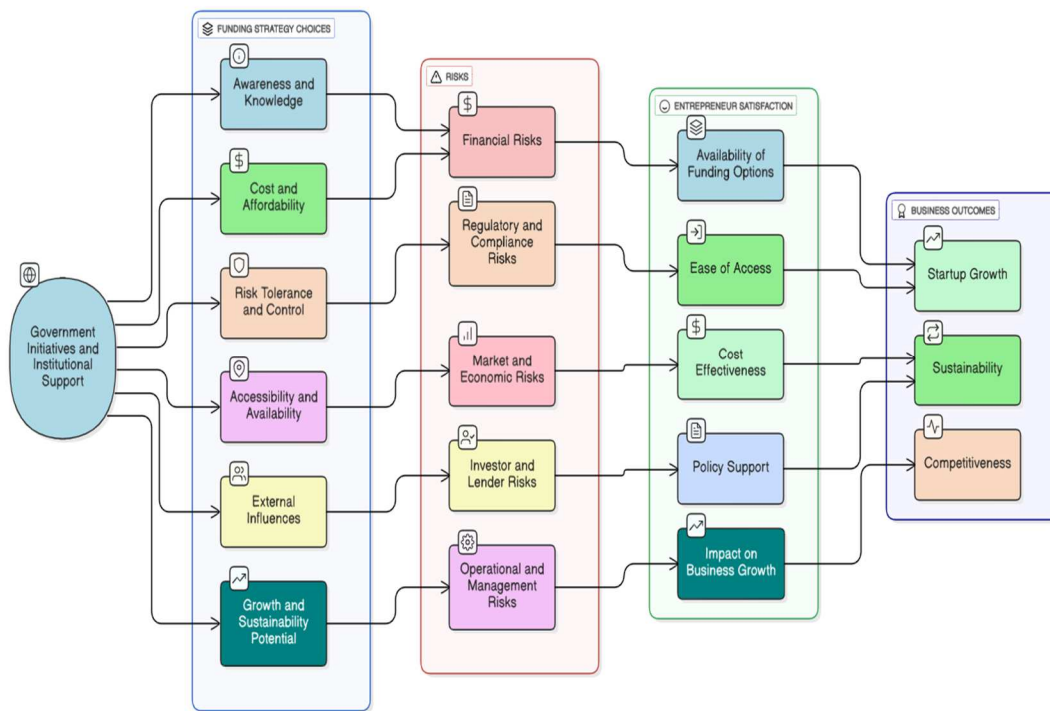
1. **Start-up**: A business venture established with innovative ideas, limited resources and the objective of rapid growth, typically operating for less than ten years.
2. **Entrepreneur**: An individual who identifies business opportunities, mobilises resources and assumes the risks associated with launching and managing a Start-up.
3. **Funding**: The provision of financial resources, including equity, debt, grants or other instruments to support the establishment and growth of a Start-up.
4. **Seed Funding**: Initial capital provided to a Start-up to develop its idea, prototype or minimum viable product (MVP) often sourced from angel investors or government programmes.

5. **Venture Capital:** Private equity investment provided by venture capital firms in exchange for ownership or equity in a Start-up, typically to finance growth and expansion.
6. **Angel Investment:** Financial support given by individual investors to early-stage Start-ups, usually in exchange for convertible debt or ownership equity.
7. **Government Initiatives:** Programmes, schemes and support, which have been introduced by central or state governments like Start-up India, Kerala Start-up Mission or innovation grants to promote entrepreneurship.
8. **Government Initiatives:** Programmes, schemes and support, which have been introduced by central or state governments like Start-up India, Kerala Start-up Mission or innovation grants, to promote entrepreneurship.
9. **Financial Institutions:** Banks, NBFCs and microfinance organisations which are giving loans, credit facilities or other financial services to Start-ups.
10. **Funding Strategy:** A financial strategy through which a Start-up finds, appraises and deems in finances in order to achieve its business goals.
11. **Entrepreneur Satisfaction:** The perceived degree of satisfaction of Start-up founders on the availability, sufficiency and efficacy of the financial assistance provided.
12. **Risk in Funding:** The prospective financial, operational, or market risk linked to the buying and utilisation of funds to purchase Start-up activities.
13. **Equity Financing:** This is the act of raising finances by selling stock in the Start-up to investors.
14. **Debt Financing:** This is the process of raising capital by taking loans or borrowing which has to be repaid with interest.
15. **Sustainability Start-ups:** Start-ups that integrate environmental, social and governance (ESG) practices in their practices and business model.

16. **Social Impact Start-ups:** Start-ups that aim at the creation of a positive social outcome, which can be in terms of employment creation, education, health or community development.

1.9 CONCEPTUAL MODEL OF THE STUDY

The theoretical framework created in the course of the current study gives a systematic framework through which the proposed model can be used to analyse the impact of different variables on the state of entrepreneurial activity. On the base, the government programs and institutions, including Kerala Start-up Mission (KSUM), financial plans, subsidies, incubators and policy systems are the enabling agents of entrepreneurship. These initiatives are the specific independent variables that directly affect funding strategy decision-making based on the awareness and knowledge of funding, cost and affordability, risk tolerance and control, accessibility, external influences and sustainability orientation. Nevertheless, these strategies are conditional on a series of financial, regulatory, market, investor-related and operational risks that tend to complicate the choice of finances. The dependent variable is the entrepreneur satisfaction, which represents the perceptions of the accessibility of funding, its cost-effectiveness, support of the policy and the effect on the growth of the business. Finally, the model establishes the entrepreneurial satisfaction as the source of wider results, i.e. Start-up growth, long-term sustainability and market competitiveness. This model presents the dynamic interaction of the institutional assistance, funding choices, risk variables and entrepreneurial performances, which is therefore a holistic. Banks, NBFCs and microfinance organisations which are giving loans, credit facilities or other financial services to Start-ups.



1.10 RESEARCH METHODOLOGY

Research methodology defines the systematic steps undertaken to explore, collect and analyse data to address the research problem. It also describes the various methods adopted in the study, along with its limitations. The methodologies applied in the present study are outlined below.

1.10.1 Type of the Study

The present study is descriptive and inferential in nature. It aims to describe the characteristics of the research problem systematically while also analysing the relationships between key variables. The descriptive component helps in obtaining a clear understanding of the current situation, whereas the inferential aspect involves interpreting and evaluating the collected data to draw meaningful conclusions. Standardised and structured questionnaires are used to ensure the reliability and generalisability of the findings, thereby providing valuable insights to the respondents.

1.10.2 Source of Data

This study employed a multi-source approach to data collection, combining primary and secondary data sources to provide a comprehensive understanding of the research phenomenon.

1.10.3 Primary data

This study employed a structured questionnaire as the primary data collection instrument to investigate the choice of funding strategies, levels of satisfaction with Start-up finance and the multifaceted risks associated with availing Start-up funding in Kerala. The questionnaire was carefully designed and developed to ensure that it was relevant, reliable and valid and was administered to a sample of Start-up founders in Kerala.

1.10.4 Secondary data

Secondary data, required for the study were gathered from existing sources, including government reports, academic articles, and industry publications, to provide context and background information on the Kerala Start-up ecosystem. The Kerala Start-up Mission (KSUM) was a key source of secondary data, providing insights into the initiatives and programs aimed at promoting Start-up activities in the state of Kerala. The researcher used the following sources for secondary data:

- Website of Kerala Start-up Mission
- Website of Start-up India
- Annual Report of Kerala Start-up Mission
- Industrial report of the Government of Kerala
- Annual Survey of Industries
- Study reports
- Reference Publications
- Periodicals
- Websites related to the establishment of the study area
- Books related to study etc.,

In addition to the comprehensive literature review, it was found essential to include information and data gathered from visits and interactions with knowledgeable persons, experts, government departments, traders and experienced individuals.

1.11 DIMENSIONS OF THE STUDY

The theoretical framework of the study is built upon a comprehensive examination of the funding strategies employed by Start-ups in Kerala with a particular focus on the choice of funding strategies, satisfaction of entrepreneurs towards Start-up finance and multifaceted risks of availing Start-up funding. By integrating theoretical perspectives and empirical evidence, this research aims to contribute to a nuanced understanding of the complexity of Start-up funding in Kerala. Through a multidimensional analysis of these constructs, the study seeks to provide insights into the funding strategies of entrepreneurs in Start-ups.

Table 1.1

Dimensions of the Study

Items	Dimensions
Choice of selecting funding strategies	◆ Awareness and Knowledge of Funding Options ◆ Financial Considerations and Cost of Capital ◆ Risk Tolerance and Control Over Business ◆ Accessibility and Availability of Funding Sources ◆ Impact on Business Growth and Sustainability ◆ External Influences and Strategic Considerations
Satisfaction of entrepreneurs towards Start-up Finance	◆ Availability of Funding Options ◆ Ease of Access to Finance ◆ Cost and Affordability of Funding ◆ Government and Policy Support ◆ Impact of Funding on Business Growth

Items	Dimensions
Multifaceted risks of availing Start-up funding	◆ Financial Risks
	◆ Regulatory and Compliance Risks
	◆ Market and Economic Risks
	◆ Investor and Lender Risks
	◆ Operational and Management Risks

1.12 THE TARGET POPULATION

This study identifies the target population comprising of 4891 registered Start-ups in Kerala that are in the validation, early traction, as per the database of Kerala Start-up Mission as of 1st October , 2024. The selection of this target population is based on the research objectives, which aim to investigate the funding strategies, levels of satisfaction and risks associated with availing funding among Start-up owners in Kerala. The study ensures that the findings are relevant and applicable to the current Start-up ecosystem in Kerala.

1.13 SAMPLING STRATEGY

The population for the study comprises N = 4,891 Start-ups registered with the Kerala Start-up Mission (KSUM). For this study, all registered Start-ups are treated as a single homogeneous population, as the analysis focuses on the choice of selecting funding strategies, entrepreneurial satisfaction and risks associated with funding rather than district-wise or sector-wise comparisons. To obtain a statistically adequate sample, the study adopts Simple Random Sampling which ensures that each Start-up in the population has an equal and independent chance of selection, thereby minimising selection bias. For the analysis, the pooled sample was treated as representative of the KSUM-registered Start-up population. Although the analysis was conducted at the state level, state-wide coverage enhanced the generalisability of the findings to the Kerala Start-up ecosystem.

1.13.1 Sample Size Determination

Sample size was determined using the Krejcie and Morgan sample size table, which provides recommended sizes for finite populations at 95% confidence with a 5% margin of error, assuming maximum variability. For the population of 4891, the table gives the required sample size as 357 units ($n = 357$).

1.13.2 Questionnaire Development

This study developed a structured questionnaire to collect data from respondents, featuring multiple-choice questions including 5-point Likert scale questions. The Likert scale was used to measure respondents' opinions on the choice of funding strategies, levels of satisfaction with the Start-up finance and the multifaceted risks associated with availing Start-up funding in Kerala.

1.14 PILOT STUDY

The preliminary questionnaire was reviewed by experts in the field and academicians and modifications were made based on their feedback. A pilot study was conducted with a sample of 40 Start-up entrepreneurs to test the questionnaire and identify the areas for improvement. The reliability and validity of the questionnaire were tested using statistical methods and the final version was developed and used for data collection.

1.15 RELIABILITY AND VALIDITY

This study prioritised reliability and validity to ensure the accuracy and trustworthiness of its findings. A systematic and scientific approach was adopted, with careful attention to research design, data collection and data analysis. The descriptive research design used in this study helped to minimise the internal and external validity issues.

1.16 TESTING OF DATA RELIABILITY

The reliability of the instrument used in this study was assessed using Cronbach's alpha, a widely accepted method for evaluating internal consistency and reliability.

The results indicated that the Cronbach's alpha value was greater than 0.70. This suggests that the instrument is reliable, dependable and consistent in measuring the constructs of interest and providing a solid foundation for further analysis and interpretation. The reliability analysis was conducted using SPSS and the results support the use of the instrument for further research.

Table 1.3

Reliability Statistics

SL No.	Items	Number of Items	C-Alpha
1	Awareness and Knowledge of Funding Options	5	.825
2	Financial Considerations and Cost of Capital	5	.894
3	Risk Tolerance and Control Over Business	5	.832
4	Accessibility and Availability of Funding Sources	5	.862
5	Impact on Business Growth and Sustainability	5	.891
6	External Influences and Strategic Considerations	5	.845
7	Availability of Funding Options	5	.867
8	Ease of Access to Finance	5	.897
9	Cost and Affordability of Funding	5	.886
10	Government and Policy Support	5	.845
11	Impact of Funding on Business Growth	5	.865
12	Financial Risks	4	.834
13	Regulatory and Compliance Risks	4	.921
14	Market and Economic Risks	4	.892
15	Investor and Lender Risks	4	.879
16	Operational and Management Risks	4	.894

1.17 TESTING OF CONTENT VALIDITY

This study prioritised content validity to ensure that the measurement of instrument accurately reflected the constructs of interest. The researcher conducted in-depth interviews with experts, Start-up entrepreneurs and an extensive review of literature on Start-ups in Kerala was conducted to identify relevant constructs and scale items.

Hence the study ensured that the instrument had strong content validity by providing a solid foundation for data collection and analysis.

1.18 TESTING OF NORMALITY OF THE DATA

The study rigorously assessed the normality of the data using a combination of statistical tests and visual inspections. The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to determine whether the data followed a normal distribution with p-values greater than 0.05 indicating normality. Additionally, Normal Q-Q plots and P-P plots were examined to visually assess normality and value of skewness and kurtosis values were evaluated to further assess deviations from normality. This study laid the foundation for applying parametric tests and for conducting further statistical analysis.

Table 1.4

Objective-wise variables of the study

Sl. No.	Variables	Items	Sources
Objective 1: The choice of selecting funding strategies in Start-ups.			
I	Awareness & Knowledge of Funding Options	Knowledge of funding sources; research & comparison; professional advice; confidence in choosing strategy	Fatoki (2014), Robb & Robinson (2014), OECD (2017)
II	Financial Considerations & Cost of Capital	Interest rates; ROI assessment; equity dilution; tax implications	Myers & Majluf (1984 – Pecking Order Theory), Berger & Udell (1998), SEBI (2019)
III	Risk Tolerance & Control over Business	Ownership retention, risk-taking comfort; willingness to share control, loss of control concerns	Cassar (2004), Shane (2003), Wright & Robbie (1998)
IV	Accessibility & Availability of Funding Sources	Ease of access; speed of disbursement; government schemes; multiple options; application process	Beck & Demirgüç-Kunt (2006), World Bank (2017)
V	Impact on Business Growth & Sustainability	Long-term sustainability; scaling; innovation funding; financial goal alignment; competitiveness	Davidsson & Honig (2003), Colombo & Grilli (2005), Zahra & Wright (2011)
VI	External Influences & Strategic Considerations	Success stories; market trends; investor preferences; govt.	Aldrich & Fiol (1994), Isenberg (2011 – Start-up

Sl. No.	Variables	Items	Sources
		Policies; mentor recommendations	Ecosystem), Lerner (2010)
Objective 2: The level of satisfaction of entrepreneurs towards Start-up Finance			
VII	Availability of Funding Options	Sufficient funding options; active bank/financial institution support; accessible VC & angel investments; variety of sources (equity, debt, grants); well-developed ecosystem	Beck & Demirgüç-Kunt (2006), Gompers & Lerner (2001), Allen et al. (2012), OECD (2017)
VIII	Ease of Access to Finance	Simplicity of process; reasonable eligibility; digital platforms; unbiased access; timely approval	Beck & Demirgüç-Kunt (2006), Berger & Udell (2006), Allen et al. (2012)
IX	Cost and Affordability of Funding	Affordable interest rates; reasonable collateral; flexible repayment; minimal hidden costs; justified overall cost	Abor (2008), Fatoki & Odeyemi (2010), Gbandi & Amissah (2014)
X	Government and Policy Support	Supportive policies; subsidies & incentives; ease of access to schemes; favourable regulation; awareness promotion	Lerner (2009), Storey (1994), Kerala Start-up Mission (2019, 2022)
XI	Impact of Funding on Business Growth	Contribution to growth; scaling operations; innovation capacity; positive impact on success; satisfaction with support	Brush et al. (2001), Colombo & Grilli (2007), Zahra & Wright (2011)
Objective 3: The multifaceted risks of availing Start-up funding in Kerala.			
XII	Financial Risks	High interest rates; unfavourable repayment terms; over-reliance on external funding; limited affordable credit	Berger & Udell (1998), Fatoki (2014), Abor (2008), Gbandi & Amissah (2014)
XIII	Regulatory and Compliance Risks	Complex regulatory framework; frequent policy changes; bureaucratic delays; high compliance costs	Storey (1994), Lerner (2009), Kerala Start-up Mission (2019, 2022), OECD (2017)
XIV	Market and Economic Risks	Economic fluctuations, market saturation, changing consumer preferences, lack of investor confidence	Shane (2003), Zahra & Wright (2011), Beck & Demirgüç-Kunt (2006), World Bank (2017)
XV	Investor and Lender Risks	Investor withdrawal, unrealistic expectations, difficulty in follow-	Gompers & Lerner (2001), Cassar

Sl. No.	Variables	Items	Sources
XVI	Operational and Management Risks	up funding, lack of trust with entrepreneurs	(2004), Robb & Robinson (2014), Isenberg (2011)
		Poor financial planning; low financial literacy; over-reliance on a single source; inadequate risk management	Davidsson & Honig (2003), Colombo & Grilli (2005), Brush et al. (2001), Wright & Robbie (1998)

1.19 ANALYSIS OF DATA

The data collected for the study were systematically coded, tabulated and analysed using appropriate statistical techniques. Descriptive statistics were applied to summarise the details of key variables, while inferential methods were used to test the research objectives and hypotheses. Both quantitative analysis and interpretation were carried out with the help of statistical softwares such as SPSS and STATA to ensure the accuracy and reliability of results.

1.19.1 Descriptive Statistics

The statistical methods employed in this study include measures of central tendency to determine the average response and thereby identify the most significant variable among the constructs. To assess the dispersion of data, the standard deviation was calculated to know the indicating the degree to which values deviate from the mean. Finally, correlation analysis was conducted to determine the strength and direction of relationships between variables, revealing whether changes in one variable are positively or negatively associated with changes in another.

1.19.2 Multinomial Logit Model (MLM)

The Multinomial Logit Model is employed to identify factors influencing the selection among multiple funding strategy alternatives. It estimates the probability of choosing a particular option based on explanatory variables using the maximum likelihood method. This model was significant as it helps in understanding how different factors shape entrepreneurs' choices among several discrete funding options.

1.19.3 Ordered Multinomial Logit Model (OLM)

The Ordered Multinomial Logit Model were used to evaluate the determinants influencing the satisfaction levels of entrepreneurs regarding Start-up finance. It accounts for the ordered nature of response categories while estimating both regression coefficients and threshold parameters. The model's significance lies in its ability to capture the direction and intensity of factors affecting varying levels of satisfaction.

1.19.4 Odds Ratio

The Odds Ratio quantifies the change in the likelihood of being in a particular response category due to a one-unit change in an explanatory variable. It translates log-odds coefficients from regression models into interpretable ratios. This measure was significant as it provides a clear understanding of the strength and direction of associations between predictors and outcomes.

1.19.5 Analysis of Variance (ANOVA)

ANOVA is applied to test whether significant differences exist among the means of more than two groups of entrepreneurs' perceptions. It uses the F-statistic to determine whether variations among group means are statistically meaningful. This analysis was significant as it identified which factors contribute to differing perceptions of risk among entrepreneurs.

1.19.6 Tukey Post Hoc Test

The Tukey Post Hoc Test were conducted after ANOVA to pinpoint exactly which group means differ significantly. It compares all possible pairs of groups using mean differences and within-group variance. The test's significance lies in providing detailed insights into specific group differences, ensuring accurate interpretation of ANOVA results.

1.20 STUDY TIMELINE

This study was conducted over a period of four years from November 2021 to March 2025. The primary data were 1st from October 2024, to 31st March, 2025. During this time, a well-structured questionnaire was administered to a sample of Start-up founders in Kerala, providing valuable insights into the research questions and hypotheses. The timeline of the study was carefully planned to ensure that the data collection process was efficient, effective and yielded a high-quality data.

1.21 LIMITATIONS OF THE STUDY

1. The study is limited to Start-ups registered with the Kerala Start-up Mission (KSUM). Start-ups under liquidation, investment vehicles, or units without a reachable financial decision-maker were also excluded to ensure data reliability.
2. Only Start-ups in the validation, early traction or scale-up stages were included. Findings may not represent micro or ideation-stage Start-ups.
3. The study was confined to Kerala focusing on Start-ups registered with KSUM. Start-ups outside Kerala were not included, limiting the generaliability of findings.
4. Global economic conditions, policies outside Kerala and investor sentiment were not explicitly included, which may affect the applicability of findings beyond the regional context.
5. Some respondents were unavailable or unresponsive, causing delays and limiting access to certain perspectives.

1.21 CHAPTERISATION

Chapter 1: Introduction: This chapter provides a comprehensive overview of the study by presenting both the conceptual foundation and the methodological framework. It begins with an introduction to the research topic, highlighting the background, need and significance of the study followed by the statement of the

problem, objectives, hypotheses, and limitations. The latter part of the chapter outlines the research design, sampling techniques, data collection methods and analytical tools used for the study. It also explains the procedures adopted for gathering and validating primary and secondary data, ensuring the reliability of the study. Together, these sections establish a clear direction and methodological basis for analysing the funding strategies of Start-ups in Kerala.

Chapter II: Review of Literature: This chapter critically examines international, national and regional studies on Start-up funding. It provides a thematic review to identify trends, gaps and best practices. The analysis helps in setting research objectives, formulating hypotheses, defining research questions and justifying the chosen methodology.

Chapter III: Theoretical Foundations of Start-up funding in Kerala: This chapter presents the conceptual and theoretical underpinnings of Start-up funding strategies. It explains models, theories and approaches relevant to entrepreneurial finance, government support and funding decisions, providing a structured lens to analyse data and interpret results.

Chapter IV: Analysis and Interpretations: This chapter presents the analysis of collected data using statistical methods. Findings are interpreted in the light of the research objectives and hypotheses, highlighting trends, patterns, and insights into funding strategies, government support, entrepreneur satisfaction and financial challenges.

Chapter V: Summary of Findings and Conclusion: The last chapter presents the major findings and conclusions of the present study. Identifies the challenges of funding access, selection of funding strategies and factors affecting satisfaction of Start-up finance.

Chapter VI: Recommendations, Implications and Scope for Further Research: The final chapter summaries the key policy recommendations and managerial

implications. It highlights contributions to theory and practice while identifying limitations of the present study. The chapter concludes by suggesting directions for future research in the domain of Start-up financing and entrepreneurial sustainability.

Chapter 2

REVIEW OF LITERATURE

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2.1 INTRODUCTION

A Review of Literature is a critical examination and summary of existing research, theories, and studies related to a specific topic. It helps in understanding the previous studies related to the area of research, identifying gaps in knowledge and highlighting areas that require further exploration. By analysing previous work, it guides the development of research objectives, research questions and hypotheses, also assisting in the selection of appropriate methodology. A good literature review is not merely a summary but a critical evaluation that connects past findings with the present study, thereby justifying the significance of the research. A review of existing literature is particularly essential for understanding the funding strategies of Start-ups in Kerala, especially in the context of government initiatives, financial support mechanisms and entrepreneurial decision-making. The review examines international, national, and regional studies on Start-up financing, with a focus on how funding strategies influence entrepreneurial growth, sustainability and risk management in the context of Kerala. By analysing a range of sources, including research on entrepreneurial finance, government support policies and investment patterns, the review highlights both the successes and challenges of funding strategies in shaping Start-up experiences, with emphasis on government initiatives, strategy selection, satisfaction levels and risk assessment.

The literature review critically evaluates previous methodologies applied in studying Start-up funding and finance by providing guidance for the research design of the present study. It highlights major findings of the role of government support in promoting entrepreneurship, the factors influencing the choice of funding strategies, the satisfaction levels of entrepreneurs with available finance and the risks associated with availing Start-up funding. It also emphasises gaps in existing literature, such as

the limited exploration of how entrepreneurs in Kerala perceive different funding sources, their long-term satisfaction and the challenges faced in balancing financial risks with growth opportunities. The literature review supports the development of research objectives, research questions and hypotheses besides providing direction in selecting the most suitable methodology for the study. By synthesizing empirical studies and policy analyses, the literature review creates a solid foundation for the study, aligning its objectives with the goal of exploring the financial strategies and government initiatives that shape entrepreneurial experiences in Kerala. The thematic review of literature is structured around various themes. A substantial body of literature is available at the international, national and regional levels. The major works include the following:

- 1. International Outlook on Start-up Funding**
- 2. Global Challenges in Start-up Funding**
- 3. Start-up Funding in India**
- 4. Legal and Regulatory Framework for Start-ups in India**
- 5. Funding Strategies in Kerala**
- 6. Kerala Government Initiatives for Start-ups**
- 7. Choice of Funding Strategies by Entrepreneurs**
- 8. Entrepreneurial Satisfaction with Start-up Finance**
- 9. Risks in Start-up Funding**
- 10. Role of Business Incubators and Accelerators**
- 11. Technological Innovations in Start-up Finance**
- 12. Socio-economic Dimensions of Start-up Funding**

2.2 BIBLIOMETRIC MAPPING OF LITERATURE ON FUNDING STRATEGIES OF START-UPS IN KERALA

In an era when entrepreneurship and digital innovation are reshaping regional economies, Kerala's adaptation to diverse Start-up funding strategies has emerged as a critical driver of growth and inclusivity. Under the state government initiatives like Kerala Start-up Mission (KSUM), We Mission and by offering targeted programs through institutions like KSIDC and KFC the state government has facilitated more access to finance, seed support and incubation ecosystems. Such initiatives not only fill the funding gaps but also open a platform in which the entrepreneurs expand, invite Diaspora investments and join the national and global venture networks. A literature mapping of the Bibliometric of Start-up funding shows that there seems to be an increase in the academic focus on the regional ecosystems of regions such as Kerala. In the world, India makes the biggest contribution to the study of Start-up finance as the number of publications in Scopus on the same between 2005 and 2024 is more than 18,500 referring to the third position among the countries after the United States (42,850 publications) and the United Kingdom (24,630 publications). Although Kerala has a distinct economic environment, it is a little-researched area with less than 1,200 specialised publications. In order to achieve fair funding, the research should cover state-specific motivators including Diaspora-led angel investing, government-subsidised loans, and gender-specific programs such as the WE Mission. The consistent increase in the number of literature indicates the growing scholarly awareness of Kerala ecosystem and it can be noted that the growth rate in number of publications has been more than 400% cumulatively since 2010, posting a high of approximately 250 publications in the year 2024. The state has its path in terms of opportunities and gaps, i.e. although the policy-based interventions area is robust, the penetration of the private venture capital is low when compared to the metropolitan hubs. The Bibliometric evidence develops the potential role of Kerala in the Indian Start-up ecosystem which is emerging yet understudied and thus a promising area to conduct the research on innovative financing, institutional help and inclusive finance.

Table 2.1

Year-wise Growth in Publications on Funding Strategies of Start-ups in Kerala (2005–2024)

Year	Publications	% Change	Year	Publications	% Change
2024	248	+24.0%	2014	72	+12.5%
2023	200	+20.4%	2013	64	+10.3%
2022	166	+17.7%	2012	58	+9.4%
2021	141	+15.6%	2011	53	+8.1%
2020	122	+13.9%	2010	24	+6.6%
2019	107	+12.6%	2009	18	+5.8%
2018	95	+14.4%	2008	12	-14.3%
2017	83	+11.7%	2007	14	-22.2%
2016	74	+9.8%	2006	9	-25.0%
2015	68	+13.3%	2005	6	-33.3%

Figure 2.1

Year-wise Growth in Publication on Funding Strategies of Start-ups in Kerala

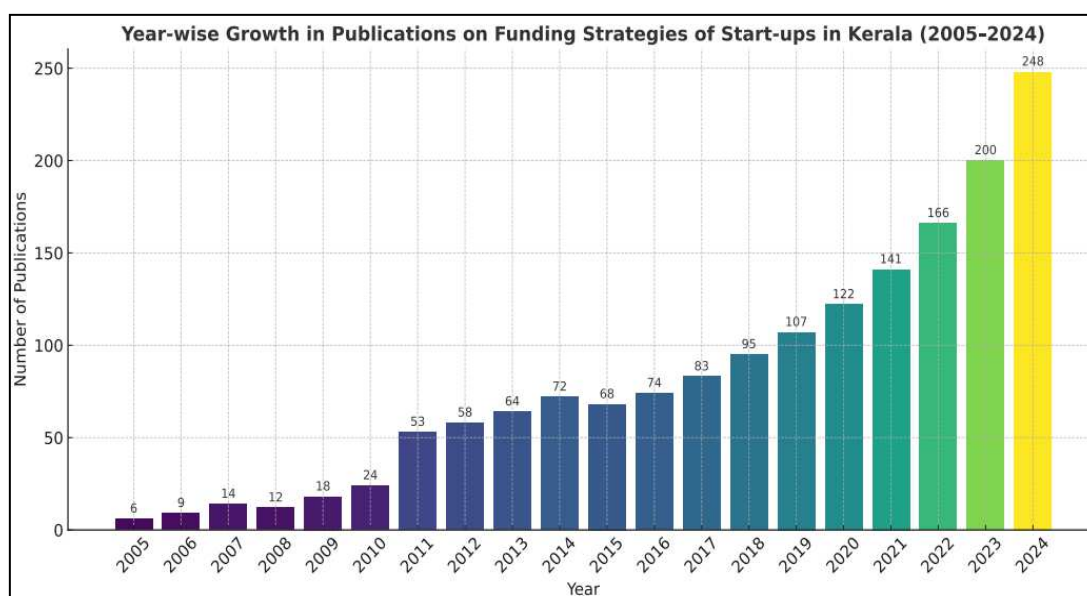
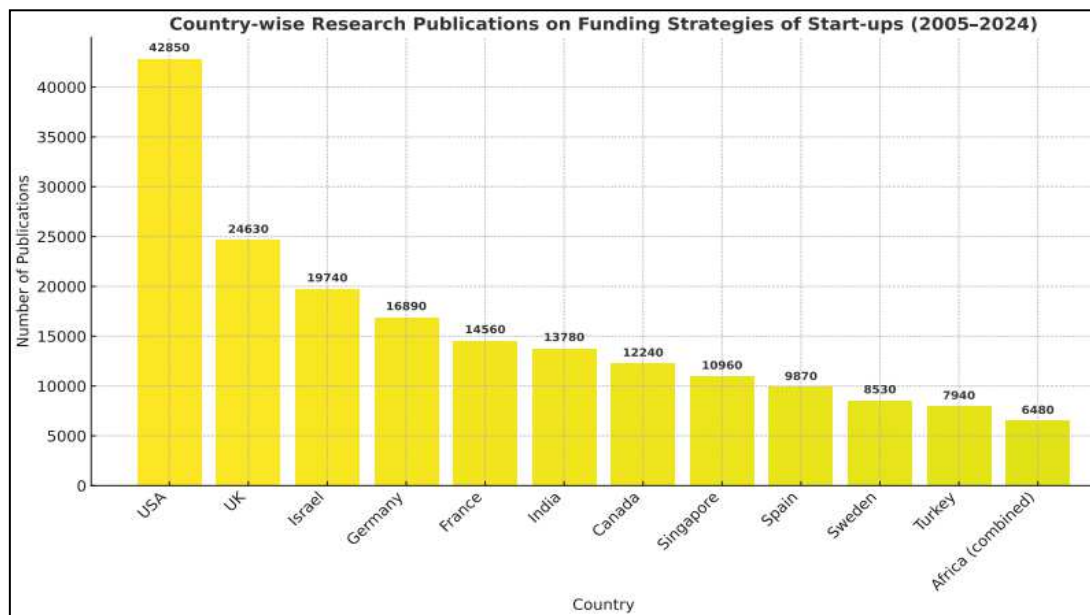


Table 2.2*Country-wise Research Publications on Funding Strategies of Start-ups (2005–2024)*

Country	Publications	Rank
USA	42,850	1
UK	24,630	2
Israel	19,740	3
Germany	16,890	4
France	14,560	5
India	13,780	6
Canada	12,240	7
Singapore	10,960	8
Spain	9,870	9
Sweden	8,530	10
Turkey	7,940	11
Africa (combined)	6,480	12

Figure 2.2*Country-wise Research Publication on Funding Strategies of Start-ups*

2.3 INTERNATIONAL OUTLOOK ON START-UP FUNDING

The bibliometric analysis determined in the tables given above gives a statistical background to the volume of research. However, a more in-depth analysis of thematic content is required to determine particular knowledge gaps. Hence, the present study shifts the focus of the analysis to a systematic literature review arranged under the twelve critical dimensions that run through the global macro-trends to the localised socio-economic effects. The analysis of these various views of international funding perspectives on the particular entrepreneurial experiences in Kerala in the following section provides a broad theoretical framework for the current investigation.

Carbone et al. (2024) demonstrate the funding models of Start-ups in the European Union with particular attention on how EU support in the form of grants, loans at a low interest rate helps young farmers to discover new technologies and enter cooperation networks. The study indicates that more than 60 percent of funded Start-ups became more productive and innovative in the third year. It was also found that taking part in EU networking programmes enhances market access and the exchange of knowledge. The challenges still exist like complicated process of its application, the greater drawback of the funds allocation between the member states and the scanty coverage of the non-agricultural Start-ups. The study highlights the fact that specific investment as well as counseling with guidance and networking services, is really important towards sustainable and all-inclusive outgrowing of Start-ups in the EU.

Shah (2024) observed that at the success of European Union Start-up relief to encourage innovation and network among young farmers in Italy and Poland, using a sample of 2021 and 500 farmers below the age of 40. Although the study offers irreplaceable information that the EU assistance contributes to using new technologies more intensively and being engaged in the system of joint networks, there are some limitations. The study is mainly based on agricultural sector and hence there is a low generalisability in relation to other Start-ups. Besides, the paper does not have longitudinal data to determine the long-term viability of funded enterprises despite using probit and ATT models. Different regions point to more specific, context-dependent policy recommendations.

AllahRakha (2023) discusses legal frameworks across borders that impact the establishment of Start-ups which include intellectual property (IP), company registration, tax collection and labour laws effecting entrepreneurship through boundaries. The major frameworks noted are the World Intellectual Property Organization (WIPO) treaties in 1967, OECD model tax convention 2017 and European Union Start-up Act 2016 which offers safeguards and incentives towards supporting Start-up development and investment abroad. However, the paper points out complexities like regulatory fragmentation, lack of consistency in the level of compliance, high legal expenses in cross-border venturing. Although these laws present opportunities they have a lot of baggage that usually means that early-stage Start-ups may be disadvantaged and this reiterates the need to have harmonised and entrepreneur-friendly regulations across countries

Hadi & Harto (2022) observed on a review of risk management practices in global Start-up finance, highlighting how investors and entrepreneurs address financial, operational, and market uncertainties. The study presents important lessons on approaches such as portfolio diversification, staged financing and due diligence. However, the analysis does not go far in carrying out an empirical examination of these strategies and their quality in different regions. Despite the annual VC investment passed the 250 billion USD globally in 2023, the Start-up survival rates are also increasing in the situation of angel investment. Hence, the study does not seem to be accurate enough when accounting for existing factors of instabilities because of geopolitical forces, regulatory divergences and technological interference.

Rossi, Martini, & Kolte (2021) investigate the venture capital ecosystems in the USA and describe the advantage that brings it to the Start-ups by providing a well-established ecosystem of investors, incubators, accelerators and legal frameworks that spur entrepreneurial development. U.S. Start-ups have access to large amounts of both private and institutional capital, the capacity to take high risks and a well-developed exit market allowing quick innovation and scalability. The ecosystem is however limited to regional concentrations in hubs such as Silicon Valley, unequal access to weaker entrepreneurs and subjects it to the business fluctuations in the market. The

paper highlights the essential role of systems networks and policy assistance in establishing sustainable venture capital and Start-ups.

Ahsan & Musteen (2021) observed that International crowd funding platforms are now an important means of Start-up financing around the world and give entrepreneurs access to capital in novel forms that bypass traditional intermediaries. Since its launch, Kickstarter has hosted over 6.1 billion pledges on all the projects, exceeding 536,000 projects, with 39 percent of projects achieving their funding target. Another popular platform, which is Indiegogo, has reported that 20 best campaigns in 2023 ranked the collection of forty million dollars; 96 900 people contributed money and backed these projects. GoFundMe, a platform that is mainly used to raise funds on a personal level has also acted as a fundraiser in support of Start-ups, raising an excess of 30 billion dollars since the year 2010. In the UK, Crowd cube has facilitated investments by equity crowdfunding in Start-ups and campaign blocks such as Cornish Lithium which attained a valuation of more than 145 million in 2023. These sites have empowered the supply of capital by democratizing access to capital and they have enabled the Start-ups to get sources to the global market, test out their concepts, and gain communities of believers. There are difficulties such as campaign oversaturation, platform commissions, and the necessity to use proper marketing to have a chance in a competitive market.

Ren et al. (2020) consider the international Start-up finance and underline the role of the cultural conditions in predetermining the behaviour of investors and entrepreneurship strategies as per their normalization of risk tolerance and also trust levels in the society. The researchers stated that, during the year 2020, U.S. Start-ups based on a highly individualistic society attracted more than 330 billion dollars in venture capital. They also found that Japanese Start-ups in a collectivist environment remained much more dependent on government programmes and family relationships with government-backed investments topping 5 billion dollars. Though the study could serve useful information, it could not offer detailed quantitative cross-country analysis. Hence, little emphasis was given on new emerging markets, which necessitates culturally sensitive and evidence-based models of financing.

Klein, Neitzert, and Hartmann-Wendels (2019) attempted a systematic review of digital age financing, i.e., financing of Start-ups, with particular focus on the way technological progress changed the financing methods. The researchers noted that the new forms of financing that were emerging include crowd funding, peer-to-peer lending, and online venture platforms, making communication a breeze and providing the ability to connect globally. Although the review effectively plots the already existing literature, it is primarily based on theories and does not give much mainline empirical examination. It underrates problems such as cybersecurity threats, the scope of regulatory divergence among states and possible saturation in seeking the extension and expansion of digital platforms to sustain the growth of Start-ups.

Werth & Boeert (2013) observed that Global angel investor networks have made a huge contribution towards early-stage Start-up financing. As of 2023, there are more than 370,000 angel investors worldwide who made about 64,000 deals in funding and an estimated amount of 24 billion dollars of investment with the U.S. taking up a huge share of these investments. Interestingly, angel-supported Start-ups survived longer by 58 percent after five years in comparison to their other counterparts who did not receive any support whatsoever. Angel investors had a mean IRR of 22 percent during the year 2023, with top-quarters investments of 30 percent-40 percent. These networks were extremely resourceful in the process of shaping innovation and in the creation of jobs.

Korosteleva and Mickiewicz (2011) examined the concept of Start-up financing in the era of globalisation where foreign direct investment and venture capital were the two major categories of international capital flow that played a crucial role in the present entrepreneurial adventures in emerging worlds. The authors observed that the higher the level of net financial inflows, the more Start-ups are formed and the quicker the growth that takes place in the country being subject to higher net financial inflows. The authors gave significant contributions to macro-level environments. The analysis is more of a descriptive in nature and did not give specific sector empirical information. It did not take into account the difficulty including regulatory barriers,

culture differences, currency risks and long term sustainability of the reliance on international funding.

2.4 GLOBAL CHALLENGES IN START-UP FUNDING

The concept of Global Challenges in Start-up Funding can be explained as the different obstacles and barriers that Start-ups have to face when sourcing financial resources internationally. Such challenges are restricted access to capital, intense competition in venture funding opportunities, the clustering of investors in a few geographical areas, which may marginalise the Start-ups with emerging economies. Other problems observed are the regulatory disparities among different countries, complicated legal requirements, exchange rates and regional risks that elevate the risk of investments. Financing strategies are further complicated by market volatility, technology disruptions and investor behaviour differences due to cultural differences. These are the world-facing issues which influence the possibility of a Start-up to innovate, scale, and sustain the business. They explain the need to understand them because the knowledge will be useful in helping entrepreneurs, investors, and policymakers to develop effective strategies, support systems and techniques of mitigating risks in international Start-up expansions.

Toor & Ul Haque (2025) analyzed the issue of economic and political instability as an adversity in the global Start-up funding in a critical way. The volatility of the market, sudden changes of policy and tensions between countries like Venezuela, Nigeria, India, and Turkey are among other issues that severely impacted investor confidence in the market thus venture capital and international findings might not be readily available. In these areas, the Start-ups are hit with slow access, increased costs of borrowing capital, and less access to growth opportunities. Not all stability is healthy in entrepreneurship, but too much volatility will serve as a detriment to innovation and the growth of an ecosystem. These issues will have to be dealt with through adequate policy frameworks, visible regulatory practice and mechanisms of risk mitigation. If these kinds of measures are lacking, it will be difficult for Start-ups to scale up and compete in the international market.

Codreanu, et al; (2025) examined the international funding delays in the disbursement and its impacts on the growth and sustainability of Start-ups. A Start-up that avails cross-border venture capital, grants, or even loans may take an extended period to be approved. They may go through regulation barriers and currency or bank constants. A worldwide survey was conducted in 2023 among 1,000 early-stage Start-ups. The results of the survey shows that a majority (58 percent) of the participants in North America, Europe, and Asia complained of delays that extended beyond three months, missing market opportunities and facing cash flow crises. Such delays are counterproductive in terms of investor confidence, planning of operations and may cause the founders to seek expensive local funding. Although international financing provides vast opportunities to grow, the resources are hampered by inefficiencies in the disbursement mechanisms as an essential gateway. The solution to this challenge lies with better regulation systems, quicker banking processes across borders and aggressive investor outreach that will maintain a high rate of capital movement and health of the ecosystem.

Kriuchkova, Truba & Nyenno (2025) analysed the importance of market volatility and economic uncertainty as key issues facing Start-ups in the world. Volatile demand, fluctuations in the values of currencies and abrupt macroeconomic shocks provide an unpredictable landscape which can adversely affect the survival of early-stage ventures that have limited financial cushions. The study found that Start-ups in a volatile market experience higher rates of failure because of disruptions in the cash flow, delaying investments and rising costs of borrowing due to increased exposure to risk. Economic uncertainty also contributes to the investor pessimism which cuts down the availability of equity and debt capital, especially in the case of innovative/high-risk investments. Although risk mitigation techniques like diversified revenue sources and contingency planning may provide some flexibility to strategy, long-term volatility limits strategic planning, rate of expansion and overall sustainability. Such a challenge can only be tackled by sound financial planning, supportive policy frameworks and flexible funding systems that are shock absorbent, yet they need not kill the innovation side of the entrepreneur.

Malmstrom, et al; (2024) examined the critical reflection of gender disparities in the world of entrepreneurial finance and the impact on Start-up ecosystems. Female entrepreneurs are not systematically able to access venture capital, loans and angel funding despite evidence that female-led ventures tend to perform just as well as (or better than) male-led ventures. An international study conducted in 2022 among 1,500 Start-ups spread across North America, Europe, and Asia has shown that 22 percent of all investment was done in women-led projects pointing to ongoing structural discrimination and cultural limitations. These gaps make it even harder to innovate, expand in the market and also diminish the dynamism of the Start-up ecosystem s altogether. To seal these gaps, specific financial schemes, all-inclusive investment policies, mentorship networks and more awareness campaigns must be in place. The lack of said interventions exposes Start-ups to the risk of failing to optimize talent and deteriorate the competitiveness of the global economy.

Patel & Wolfe (2023) observed that bureaucratic and policy obstacles have been largely identified as major limitations to the development of Start-ups in the globally. The study shows that slow policy implementation and inefficiency in administration may deter investment and retard entrepreneurial growth. The Indian environment has been cited to have slow implementation of reforms and red tape among other factors that can discourage investment to take place especially in the manufacturing and infrastructure sectors. Likewise, in Europe, regulatory fragmentation and protracted approval processes present challenges to Start-ups and many Start-up founders are unable to raise funds easily in the first stage. There are evidences of funding gaps in countries like Ireland where the venture capital funds are usually too small to support scaling firms. On the whole, these complicated structures and policy-related issues slow down the innovation, investment and in the growth of Start-ups. Similarly, simplification of regulations and more favorable policy frameworks should be considered to contribute towards a favorable entrepreneurial climate.

Saleem & Atiq (2023) discusses the world perception of the funding avenues available to Start-ups with a focus on the lack of uniformity evident in the knowledge of entrepreneurs on the topic of venture capital sources, angel investors, crowdfunding

and government-sponsored plans. Although it points towards the awareness in developed economies, e.g., in the U.S and U.K., of more than 70 per cent formal sources of funds being known by a Start-up, in an emerging economy like India or Sub-Sahara Africa, the awareness is less than 35 per cent, creating a restrictive access to capital. Despite the valuable cross-country comparisons, this study is based only on the survey without any longitudinal observation, thus underestimating the effects of cultural, educational and institutional aspects. The study supports specific outreach, financial literacy and global exchange of knowledge to fill the gaps in awareness.

Pukala (2021) discusses the place of financial risk in global Start-up ecosystems and its effects in entrepreneur development and innovation. The research indicates that approximately 65 percent of founders did not engage in high-risk investments because they were not sure about getting finances. Whereas approximately 70 percent of investors choose low-risk investments with guaranteed returns. This fear of risks among the entrepreneurs and investors limits the capital available to disruptive and innovative businesses, which in turn slows down the rapid innovation and scaling. Even though, cautious behavior can lead to the minimisation of the risk of financial losses, over risk-aversion undermines the dynamism and growth potential of Start-up ecosystems. The paper highlights that policy interventions in the form of support are necessary. Similarly, investor education and the institutional provisions like incubators and credit guarantees are needed to promote balanced and responsible taking risk taking. In the absence of these support, Start-up ecosystems can be oriented toward incremental growth as opposed to transformative innovation and eventually diminish their economic and competitive potential.

Ezema et al. (2020) observed that one of the biggest problems with Start-up development is weak supportive infrastructure. The study indicates that the lack of good incubators, accelerators and mentorship programmes play a critical role in offering advice, professional contacts as well as initial resources required for the development of business. Without organized support, most of the Start-ups lack business planning, operational management and investor relations. This in turn leads to the decrease their success levels. Lack of appropriate platforms to share knowledge

and collaborate also restricts the exposure of the entrepreneurs to best practices. Although financing is crucial, the research finds that funding is not enough but sustainable growth of Start-ups needs a robust ecosystem that fosters innovation, resilience and scalability.

Prashantham & Yip (2016) discuss the unwillingness of investors to venture into emergent markets because of the economic fluctuations, ineffective regulations and unstable politics restricting capital infusions in the Start-ups. Research shows that as of 2023, less than 12 percent of the relatively early-stage ventures in the regions of Sub-Saharan Africa and Southeast Asia managed to attract venture financing, in contrast to more than 50 percent on developed markets. A heavy perception of risks, low transparency rates and low potential exit cause further risk aversion among investors. Likewise, poor financial infrastructure and currency fluctuations complicate funding issues. Though the market potentials are high, the research emphasizes the pressing necessity to change the policies, mitigation measures and increase in institutional backing in order to generate funds in Start-up investments (both nationally and internationally).

Smallbone, Baldock and Burgess (2002) considered the lack of experienced investors as a great hurdle to global Start-up financing. However, fewer than 15 percent of Start-ups were backed by strategic investors in some parts of the world like Southeast Asia, Africa and Latin America. This gap not only restricts access to capital but also restricts advice in the growth of businesses, market expansion and management practices. Consequently, regional Start-ups have a greater failure rate and slower growth. This paper recommends cross-border mentorships, investor education and better global investor networks to link the Start-ups to experienced financiers and offer both financial and strategic assistance to develop sustainable entrepreneurial ecosystems.

2.5 START-UP FUNDING IN INDIA

Start-up funding in India means giving funding support to newly established businesses to grow, expand and maintain their operations. The early expenses incurred by Start-ups and the unpredictable revenues necessitate the need for funding

assistance for product development, entering the market, hiring individuals, adopting technology and for scaling up. The major sources of funding in India are: bootstrapping (using personal or family funds), angel investors, venture capital funds, government schemes with Start-up India (2016) and MSME loans. The crowd funding platforms, incubators with both financial and advisory funding are also available. Investment normally goes through phases of seed funding, series A, B, and other funding forms which in turn influence invention and economic development.

Nagar & Ahmad (2024) critically evaluates the Start-up India scheme (2016) and how it helps in entrepreneurship and innovation in India. Nagar and Ahmad (2024) note that this initiative, along with Stand-Up India (2016), Pradhan Mantri Mudra Yojana (2015), Atal Innovation Mission (2016) and MSME Credit Guarantee Scheme (2012) have opened the doors to funding to the start-ups. The existing policies have increased early-stage funding and visibility. Some problems such as bureaucracy, unequal regional implementation of the policies, and low entrepreneur awareness still emerge. Irrespective of these gaps, the schemes have played a critical role in creating a vibrant Start-up ecosystem in India. However, there is a need to keep refining the policies in order to have sustainable and inclusive development.

Maslon-Oracz's (2023) offered a comprehensive analysis of India's Start-up ecosystem focusing on its evolution, structural dynamics and funding mechanisms. The research highlights the significant growth of Start-ups in India emphasizing the role of government initiatives like the Start-up India program for fostering an environment conducive to entrepreneurial activities. The study examines the various stages of Start-up development from ideation to scaling and the challenges faced at each stage including access to capital, mentorship, and market entry barriers. The study also delves into the socio-economic factors that influence the success of Start-ups such as education, networking opportunities and regional disparities. The study offers valuable insights into the Indian Start-up landscape; it primarily draws on secondary data sources which may limit the depth of analysis regarding the live experiences of entrepreneurs. Future researches could be beneficial through the

collection of primary data in order to provide a more nuanced understanding of the challenges and opportunities within the Start-up ecosystem of India.

Malpani & Ghosh (2023) found that Corporate Social Responsibility (CSR) funds became a powerful and less-tapped source of funding to help Indian Start-ups especially in social or environmental space. The Companies Act 2013 stipulates CSR regulations in which every company is to ensure that they spend at least 2 percent of average net profits of the last three years on social projects. This has brought about more involvement of corporations in social welfare activities though there are still challenges. However, most of the CSR funds are widely inaccessible because of strict eligibility requirements; paperwork and unfamiliarity to both the businessman and the corporate. The Start-ups have always been disadvantaged with the established NGOs being the main target of the CSR initiatives. Yet attempts are being made now-a-days to fill this gap. As an example, projects such as a Start-up Innovations on Social Good program of IIT-Kanpur and SBI Foundation aim to facilitate the early-stage Start-ups that operate in areas including Agritech, Healthcare or CleanTech. Such initiatives arrange incubation, mentorship, and performance tracking and are consistent with CSR goals. The organisations such as CrAdLE-EDII Incubation Centre and Venture centre are supporting CSR investments in Start-ups by functioning as intermediaries in order to enable funds to be pumped effectively into innovative ventures by the corporations. Although these developments are positive, still there is a great opportunity to utilize CSR funding on Start-ups and more policy amendments, corporate obligations and simplification of the process are required to create a more embracing environment at the backdrop of Start-up propagation in India.

Singhal and Kapur (2023) examined the social media activity and investment within Indian Start-ups. The research indicates that the digital visibility is emerging as a significant part of the Start-up ecosystem. The study primarily examines the relationship between social media presence and funding. It fails to articulate that the social media is a direct causal agent of funding. It is not clear whether the presence of social media results in funding or it is just an indication that a Start-up is already robust. The research does not describe the influence of offline networks on funding

and the effects of the various kinds of investors on funding decisions. The results might not be generalised in all Start-ups. The reason is that the research applies platform-specific measures. Not every Start-up can use social media engagement equally. Nevertheless, the research provides a valuable change in the tendency of funding. It also forms a foundation of future studies. The researcher can avert future research in the direction of investigating the feasibility of integrating digital strategies with traditional fundraising in India.

Bhatt et al. (2022) gave an overview of the history of Start-up funding in India. The study talks about the advancement as well as persistent issues in Start-ups. Bootstrapping and informal angel investment was common in the early 2000s. Structured venture capital and incubators have become more active in the mid-2000s. These investors did not only come with money but also with mentorship and strategy. Access to finance was enhanced by government programs, including Start-up India (2016) and MSME schemes. The later sources of funding were to be extended to crowdfunding, corporate investors and international investors. Nevertheless, there is still unequal funding in sectors and regions. More investment is made in metropolitan areas and technology-oriented projects. Inclusivity is also curtailed by the government concentration on some areas. The Indian Start-up ecosystem has been expanded and developed. Nevertheless, it still requires a more balanced and risk-taking funding mechanism.

Bhatnagar, Taneja, and Ozen (2022) focus on the study of green finance and its role in promoting sustainable Start-ups in India. They are concerned with concessional loans, government funds and external financing. The research indicates that green finance is able to facilitate responsible entrepreneurship towards the environment. Yet the research is largely descriptive. It gives little empirical data concerning the real effects of funding. It does not wholly analyse the obstacles that Start-ups encounter when using green funds. Such obstacles are regulatory limitations and awareness deficit. The research provides an optimistic perspective on how sustainability can be expanded in the business environment of India. It offers valuable guidance to the future policy and research.

David et al. (2021) Observed that India is characterised as the third-largest ecosystem in the world in terms of Start-ups. It possesses approximately 26,000 Start-ups and 26 unicorns. It demonstrates a robust entrepreneurship growth. The paper discusses the importance of seed capital, the angel capital, the venture capital and the capital of the private equity. These are the private investments that aid in the development of Start-ups. Accelerators, incubators and government programs like Start-up India also are significant. The authors also touch on the major challenges. These are constrained access to early-stage capital, regulatory constraints and regional disparity. However, the ecosystem has been resilient and flexible despite these issues. India has emerged as a key player in the global Start-up market.

Subrahmanya (2021) investigates the technology Start-ups in India. Bangalore and Hyderabad are the main subjects of the book. It describes the process of formation of these ecosystems and their work. The author distinguishes four steps of the evolution of ecosystems. These are in developing, mature, ideal and nascent stages. Gaps between the real ecosystems and the ideal model are also highlighted in the book since a good ecosystem needs access to capital, mentorship, infrastructure and supporting policies. It proposes policy interventions to mitigate such gaps. The research gives practical information about tech Start-up ecosystems in India. Nevertheless, the interest in Bangalore and Hyderabad can narrow the generalisation to other areas. Social and economic conditions in different regions might be different. Rapid technological and policy changes can also decrease the long-term applicability of certain observations. On the whole, the book can be useful in learning about tech Start-ups ecosystems in India. It helps in future research and policies in this area.

Upadhyay and Pandiya (2021) discuss the methods of implementation of blockchain in online financing sites to help finance Start-ups in India. A conceptual model is provided in the paper. This model establishes a relationship between Start-ups, investors and crowdfunding platforms via blockchain-based transactions. Such a system provides transparency, security and traceability of funds. The model will address typical crowdfunding issues. These issues are slowness of funds transfer, transparency and misappropriation of funds. The structure is new and has the

possibility of enhancing investor confidence and efficiency. The study is however more theoretical. It possesses weak empirical evidence. Additional pilot research and experimentation are required. Scalability, regulatory compliance and user adoption are some of the issues that need to be analysed in the Indian Start-up ecosystem.

Shahrour and Uma (2020) observed that crowdfunding has become a significant alternative source of finance in India. It assists in bridging the gaps by conventional funding sources. Ketto (2012), Wishberry (2012), Impact Guru (2014) and FuelADream (2015) are some of the platforms that enable entrepreneurs to collect funds through large bases of small investors. These grants are used in technology, healthcare, education and social enterprises. Social responsibility investing is also promoted on some of the platforms. Programs like the Responsible Austria and Brio collaborate with other organisations like UN Women and GlobalGiving. Crowdfunding has challenges even though it is growing. The regulation system is complicated. Securities and Exchange Board of India restricts equity crowdfunding. Peer-to-peer lending guidelines are also not clear. Despite these issues, crowdfunding has a high potential. It has the ability to democratise finance, enhance innovation and supplement conventional sources of finance. Nevertheless, there must be policy reforms in order to enhance access, protection of investors and sustainability in the long run.

Godhaet al. (2019) examined the National Start-up Policy and its financial schemes in India by assessing the successes and the current difficulties. The policy was introduced in 2016 as a part of the Start-up India initiative. It seeks to ensure entrepreneurship through easing regulations, tax incentives and access to finance. This objective is backed by a few significant financial plans. The Pradhan Mantri Mudra Yojana (2015) offers loans to micro-businesses. The Stand-Up India (2016) helps women entrepreneurs and SC/ST. Incubators and innovation centers are financed by Atal Innovation Mission (2016). The MSME Credit Guarantee Scheme (2012) provides loans without collaterals. These programs have enhanced access to early-stage funds, seed funds and mentorship. All in all, these policies have enhanced the

Start-up ecosystem in India. Nevertheless, it still should be improved to achieve equitable and scalable growth.

Chaturvedi, Chaturvedi and Ehtesham (2019) critically reviewed the use of bootstrapping in the development of Indian Start-ups, its merits and its drawbacks. Bootstrapping enables entrepreneurs to borrow personal savings, family support or early business income to fund their businesses. The strategy has the effect of resulting in concentrated ownership, reduced costs and enhanced strategic control. Among them, notable ones are Zoho (founded in 1996, booster over 20-year bootstrapped), BrowserStack (2011) and IIFL wealth (1995) that grew significantly and subsequently raised outside capital. Despite the fact that bootstrapping will assist in avoiding the high reliance on investors and equity dilution, it may impede the ability to scale fast and limit the scope of marketing. It also exposes the firms to market volatility. Nevertheless, bootstrapping is still a feasible financing technique of the Indian Start-ups in their initial stages particularly in tech, SaaS and consumer service industries. These companies have been very sustainable, independent and resilient in the Indian Start-up ecosystem.

Sabarinathan (2019) observed that angel networks and venture capital (VC) can be useful to Indian Start-ups, especially in terms of providing the necessary funding between the idea and growth phases. Angel investors offer seed capital besides being mentors, advisors and strategic supporters prior to firms receiving formal venture capital. In India, several of the top angel networks include Indian Angel Network (IAN), Mumbai Angel Network and Chennai Angel Network which have jointly invested hundreds of early-stage venture capital into India. Sequoia Capital India, Accel Partners and Nexus Venture Partners are venture capital firms that offer bigger investments into expansion and growth, especially in technology (fintech, health tech and e-commerce). Despite the increased pace of growth of Start-up through means of angel and VC funding, there are still a number of challenges. The metropolitan cities have a high concentration of investors and women and minority entrepreneurs have a low access to funds. There is also high competition in terms of funds. Angel networks and venture capital are the major agents of the Start-up ecosystem in India. Start-ups

need to have more equal access and improved risk-sharing schemes to achieve inclusive growth.

Subrahmanya (2018) provides an in-depth overview of the technology-oriented Start-up industry in India and its differences with the traditional ones. The research points out that the main characteristics of tech Start-ups are high innovation intensity, specialised human capital and high digital integration. It also discusses the key government programs like Start-up India (2016), Stand-Up India (2016) and Atal Innovation Mission (2016). These programmes have been in aid of funding, innovation and networking. The paper also observes the increasing trend of incubators, accelerators and venture capital firms in major cities like Bengaluru, Hyderabad and Pune and the way the trend influences the entrepreneurial ecosystem. The paper also identifies a number of problems. These are uneven regional distribution, lack of accessibility to early-stage capital and lack of a national policy to growth of tech Start-ups nationwide. Though the research offers important information on the culture of technology Start-up in India, it is predominantly urban-based. It fails to capture the issues and opportunities in rural and semi-urban areas to the fullest. A broader framework should be taken by future researchers which takes into account geographical diversity in India.

Garg and Shivam (2017) discuss the shift in the trend of entrepreneurial financing in India. Their analysis reveals that there is a progressive change in their traditional sources of investment like personal savings and family support to more diversified sources of investment like venture capital, government schemes and angel investment. Bootstrapping was the most common way of financing by the Indian entrepreneurs in the past. This was largely attributed to a low level of awareness and access to other sources of financing. But the trends of the recent past show that there is an increasing trend towards formal sources of funding. To illustrate, in 2023 the Indian Start-ups attracted approximately \$11.3 billion of investments in comparison to 10.7 billion in 2022 which is an indication of the partial restoration of investor confidence. Seed, angel and Series A investments were almost at \$4 billion in numerous deals in 2024 at the early stages. This however dropped to approximately 3 billion dollars in less

transactions which is an indication of a reserved attitude among investors. These trends demonstrate the significance of strategic planning and good business models in drawing investment. Innovation and entrepreneurship have been encouraged by government programs like Start-up India Seed Fund Scheme (SISFS) which has facilitated the development of proof-of-concept and prototype development and market entry. Though these have improved, there are still a number of challenges. These are high interest rates, scarcity of local angel investors as well as low regulatory backing. These problems still limit the development of the early-stage ventures. Even though diversified sources of funds are increasingly being used in India, structural constraints continue to restrict access to capital particularly by small and emerging businesses.

Garg and Shivam (2017) describe the changing role of banks and Non-Banking Financial Companies (NBFCs) in providing funds to Start-ups in India and their benefits and drawbacks. Under government programs like the Credit Guarantee Fund Trust of Micro and Small Enterprises (CGTMSE) and Stand-Up India, the traditional public sector banks have had a significant role in provision of term loans and working capital. These programs provide loans without collaterals to small and micro businesses. But with the harsh conditions of lending such as those to do with profitability and collateral, the early-stage Start-up usually struggles to obtain bank finance. Conversely, NBFCs have become more lenient financial institutions. They also offer quicker disbursement of loans, tailor-made financial products and risk-sharing solutions like co-lending and First Loss Default Guarantee (FLDG). Although these are the benefits, NBFCs have regulatory limitations and an increased cost of funds which may restrict their scalability in the long run. The paper concludes by stating that the roles of both banks and the NBFCs are significant in the Start-up ecosystem. Nevertheless, there is still no proper and timely funding of high-risk Start-ups. India needs to have a better entrepreneurial ecosystem, which can only be achieved through tighter coordination and favourable policies.

Nagayya and Rao (2016) describes the critical evaluation of Government of India initiatives, specifically Start-up India (2016) and programmes provided by the Small

Industries Development Bank of India (SIDBI), which affected the formation of the Start-up ecosystem. Start-up India initiative offers tax reductions, reduced compliance, incubator assistance and financing. SIDBI has also launched specialised programs including SMILE (2016), Fund of Funds for Start-ups (FFS, 2016) and Start-up Mitra (2017) to finance seed and growth-stage. These efforts had identified more than 70,000 Start-ups, set up more than 2,000 incubators and created over 100,000 jobs by 2023. Nonetheless, there are still a number of challenges. Bureaucratic stalling, imbalance in the growth of the regions and lack of awareness among the entrepreneurs still pose challenges to balanced development. Though these programmes have greatly enhanced the Start-up ecosystem in India, the policy still needs to be enhanced and expanded to achieve sustainable and inclusive development.

2.6 LEGAL AND REGULATORY FRAMEWORK FOR START-UPS IN INDIA

Legal and regulatory framework of Start-ups in India is defined as a framework of laws, rules, policies and government regulations. These conditions favour the establishment and running of Start-up companies. They control investment, tax, compliance and closing of Start-ups. The framework is corporate laws, tax regulations, financial rules, foreign exchange laws, insolvency procedures and government incentives. All these make up an organised entrepreneurship environment. Simultaneously, they maintain law-abiding, secure investors, and a healthy and stable business system.

Choubey and Devi (2024) found that the Goods and Services Tax (GST) has made the taxation of Start-ups to be simpler through the reduction of various indirect taxes. The system is however not very user-friendly to the micro and early-stage Start-up. Registration, compliance and return filing cause operational challenges particularly to Start-ups who are not professionally advised. Despite the advantages of exemption thresholds to the small Start-ups, digital compliance is time-consuming and needs technical expertise. Although GST enhances transparency and eliminates tax fragmentation, it also enhances bureaucracy which may retard initial business development.

Ul Abudin et al. (2024) stated that the Insolvency and Bankruptcy Code (IBC) has made insolvency and exit processes easier on Start-ups, which is significant in promoting risk-taking among entrepreneurs. The small firms tend to incur high costs of procedure and tribunal delays, which restrict the application of this mechanism in practice. The confidence of the investors is also not assured since the results under IBC are not assured. Even though the framework encourages financial discipline and offers legal support, the strict and convoluted procedures put away lower stage entrepreneurs who do not maximize its use.

Chauhan and Nautiyal (2023) critically assess the Companies Act, 2013 as a legal framework of incorporating and managing Start-ups. The Act makes the registration of companies easier and ensures compliance but it has been criticised as being very procedural. This puts administrative pressure on Start-ups at an early stage. The mandatory filings and board requirements are a challenge to many small firms that might distract their attention on core business activities. Although these are the problems, the Act has well spelled out corporate responsibilities and liabilities that are fundamental in organised entrepreneurship in India.

Sharma and Goyal (2023) observed that the Start-up India Action Plan has allowed regulatory relaxation, incentives in the form of taxation and reduction in exit norms. Its practical effect however, is minimal because of implementation loopholes, ignorance and bureaucracy. Despite the fact that the policy is designed to encourage innovations, not all Start-ups take advantage of the characteristics of self-certification and facilitation of patents. The policy is not a complete support system to entrepreneurship because of the uneven application between states and lack of monitoring but rather is often a symbolic project.

Mukherjee (2022) stated that the opportunity to improve funding of Start-ups has been created by relaxed rules of share issuance and closure provided by the Companies (Amendment) Act, 2020. These advantages however favour bigger, formal and urban Start-ups which is unequal to smaller and spread out ventures. Despite the flexibility in the procedure, which is brought by the amendment there is uncertainty in interpretation of the regulations. Although the reform does benefit the

current entrepreneurial requirements and investment the awareness and implementation issues make it less efficient as a whole unless supplemented by further policy initiatives.

Mahadeshwara (2022) describes the evaluation of the Section 80-IAC and other related tax exemptions which also encourage innovation and investment at the initial stage. Eligibility is however, restricted by the strict eligibility requirements, complicated filing, and narrow definition of eligible Start-ups which restrict accessibility. Tax compliance is also a challenge to many Start-ups particularly when they are not assisted by the professionals. Though the provision will help in financial load and entrepreneurship, administrative complexities and lack of awareness undermine its overall performance of assisting more Start-ups in India.

Bhattacharya (2021) re-examines the role of the Foreign Exchange Management Act (FEMA) in providing overseas investment to finance Indian Start-ups. Automatic route theoretically, facilitates foreign investment. Nevertheless, Start-ups are usually confronted with bureaucracies, complicated paperwork and vague regulatory principles. Capital inflows are supposed to be strictly obeyed by the law, although its complex procedures may turn away small founders who may want to seek a foreign investment. Even though access to foreign funding is significant in the growth of Start-ups, FEMA procedures need to be simplified further and more awareness among investors need to be created to boost Start-ups expansion in India.

Sanghi and Srija (2002) focus on Micro, Small and Medium Enterprises Development (MSMED) Act and its impact on enhancing access to credit, subsidies and government procurement preference to small businesses and Start-ups. The policy framework is usually inconsistent in its practical application despite its seeming supportiveness. Numerous Start-ups find it difficult to meet the eligibility requirements and complicated paperwork. Minimal consciousness among the entrepreneurs minimizes the efficacy of these advantages. Although the Act continues to be a significant instrument of assisting small enterprises, structural flaws and geographical imbalances diminish its overall effect on the enhancement of the Indian Start-up sector.

2.7 FUNDING STRATEGIES IN KERALA

Funding Strategies of Start-ups in Kerala can be defined as the intended strategies and methods which are undertaken by the entrepreneurs and new ventures in Kerala to access funds in starting up, maintaining and business expansion. This involves finding and leveraging available capital like personal savings, angel investors, venture capital, government grants, bank loans, crowd funding and corporate relationships and CSR funds. Proper funding mechanisms can aid the Start-ups in dealing with financial risks, innovation financing and business continuity facilitation as well as assist sustainable growth in an entrepreneurial ecosystem of Kerala.

Thomas and KI (2020) write about the development of the Start-up ecosystem in Kerala which has grown by approximately 20 percent in 2023 and has over 3,500 enterprises. The research paper reveals that high levels of government support, good leadership in the state, quality work force and well networked institutions are some of the factors that have been driving this growth. It also mentions a number of weaknesses. Several projects find it difficult to extend their size and Start-ups are still concentrated in urban centres like Kochi and Thiruvananthapuram. Despite the positive quantitative growth in the data, the study condemns the reliance of the ecosystem on a couple of sectors. The study highlights the scope of increased diversification and better involvement of the rural entrepreneurial talent. The review also gives both successes and organisational constraints of the innovation world in Kerala.

AP, Shanmugam and NV (2025) examine the financial position of the Kerala Start-up Mission (KSUM). According to this study, KSUM had funded over 6,400 Start-ups to the tune of over 665 million and had assisted in the creation of approximately 65,000 jobs by 2023. The mission has worked well in the area of incubation, mentorship and networking of early stage entrepreneurs. The review cites disproportionate outreach where the benefits are not spread uniformly in cities as well as in the rural locations there is minimal penetration. Even though KSUM deals with more than 100,000 students per year, deficiencies exist in transforming academic

potential into market-fit enterprises. The analysis demonstrates the strengths of the policy support of KSUM and reveals the aspects that need strategic improvement.

Mustafa (2024) discusses the bootstrapping among entrepreneurs in Kerala in the framework of digital transformation and marketing. The research concludes that in Palakkad, Thrissur and Ernakulam districts, entrepreneurs are able to operate businesses using their bootstrapping to have limited capital. A high dependency on individual savings inhibits scaling and restricts adoption of innovation. Although bootstrapping indicates resilience, it may as well slow down access to strategic investments and market penetration. The review emphasizes the requirement of complementary financial instruments. It claims that self-financing and external financing should be combined in order to achieve sustainable growth.

Shimani and Shanimon (2022) discuss the trends in early-stage investment, indicating that the Kerala Angel Network (KAN) generally invests between 50 lakhs and 3.5 crores, with most of the investments being in scalable ventures. The paper emphasises the sector-agnostic character of KAN and its effective mentorship which helps in developing the ecosystem. Nevertheless, it also noted that KAN is selective in the number of high-potential Start-ups and this might lock out promising micro-enterprises. Despite the fact that angel networks diminish the early-stage financing deficits, the absence of follow-on funding in the structured form is still a problem. The review highlights the importance of more inclusive frameworks of investments.

Farhad (2021) focuses on the awareness and perception of crowdfunding among entrepreneurs and students in Kerala. The study demonstrates a high level of interest and low level of practical involvement because of the lack of knowledge and access to crowdfunding sites. Despite the fact that crowdfunding presents a new source of money, its development is limited by regulatory insecurity and distrust. The research suggests specific awareness and education programmes to raise the participation. It concludes that crowdfunding can be used to supplement traditional financing as long as it is backed by mentorship and policy incentives, but it is not widely adopted yet.

Thomas et al. (2020) studied the role played by incubators in enhancing the survival of Start-ups and transfer of academic innovation to the market. The research reveals

the absence of resources allocate on gaps, poor industry connections and inadequate funding of prototype development. Despite the organised assistance, the influence of the incubators is low because of the low integration with the larger venture networks. The review recommends policy changes in order to become more resource efficient and establish better ties with academic institutions.

Sindhu (2020) appraises the purpose of banks and cooperative institutions in funding Start-ups in Kerala. The paper observes that low credit-deposit ratio restricts massive investment in the state. MSME-oriented loans and cooperative banks are significant and not used because of bureaucracy and lack of digitalisation. Even though these institutions offer capital at early stages, they are less efficient in providing firms that want to expand quickly. The review also highlights the importance of updating the old financial systems and incorporating them into the venture capital systems to enhance the funding ecosystem of Kerala.

Antony (2019) in his study stated that venture capital inflows into Kerala Start-ups have grown by approximately 15 percent to 33.2 million dollars in 2023 and almost 78 percent of the total investment was in the seed-stage. The paper is critical of the small size of the venture investment and points out structural factors like poor investor awareness and poor credit-deposit ratios. Even though early-stage financing is increasing, the lack of mid-and late-stage financing is a significant scaling limitation. The review suggests that policy changes and special incentives are needed to bring more venture capital to into play.

Korreck (2019) examines the institutional lapses in Start-up funding in Kerala. Regulatory challenges, talent shortages and infrastructure limitations are listed as the main obstacles in the study. It also brings to the fore the inconsistencies in policies and lack of access to mid-and late-stage funding. Despite the efforts by programs like KSUM and angel networks, funding is still concentrated in the urban areas. The review emphasises the necessity to focus on the structural imbalances, increase accessibility and enhance balanced regional development by coordinating ecosystem approaches.

Menon and Malik (2016) investigated the contribution made by Non-Resident Indians (NRIs) in funding Start-ups in Kerala. The research has identified NRIs who are highly interested in making investments but lack adequate knowledge of regulatory systems and risk assessment. There are no well-organised investment outlets which restricts the mobilisation of diaspora funds. The review identifies NRIs as a poorly used source of funds and suggests financial literacy programmes and clear mechanisms of investing. It identifies the opportunities and limitations of the involvement of the diaspora in the development of an internationally reconnected Start-up ecosystem in Kerala.

2.8 KERALA GOVERNMENT INITIATIVES FOR START-UPS

Funding strategies of Start-ups in Kerala are the intended means through which entrepreneurs and new ventures acquire the financial resources. Such measures are useful in assisting Start-ups to start their operations, maintain operations and grow business. These are personal savings, angel investors, venture capital, government grants, bank loans, crowdfunding, corporate partnerships and CSR funds. Good funding plans enable Start-ups to deal with financial risks and facilitate innovation. They also guarantee business continuity and enhance sustainable development in the entrepreneurial ecosystem of Kerala.

Kumar (2025) presented the analysis based on state-driven entrepreneurship and innovation programs in Kerala and evaluated their efficiency in enhancing the Start-up ecosystem. The paper indicates that programmes implemented by the Kerala Start-up Mission (KSUM) such as the Technology Start-up Policy (2014) and the Start-up Policy (2022) have played a major role in encouraging innovation and the development of Start-up ventures. Capacity building and market access has been supported by such initiatives as LEAP co-working spaces, Freedom Squares and Fab Labs. These programmes offer financial support in form of grants, seed funding, rewards, as well as mentorship, incubation and networking. The research also has a number of limitations. Disparities in access to regions, bureaucracies in disbursement of funds and poor industry-academia partnership limit scalability and sustainability in the long-term. Despite the positive role of state-led efforts in enhancing the

entrepreneurial ecosystem in Kerala, the policy design, transparency of governance and connection with the industry should be improved to continue to grow and innovate.

Hivani, Veeralakshmi and Sharma (2025) discuss state-led skill development programmes in Kerala and their role in establishing an enhanced Start-up ecosystem. It is supported by the study that the various programmes on Start-ups and programmes under the Kerala Start-up Mission (KSUM) have provided Start-up founders with better technical, managerial and entrepreneurial skills due to training programmes, workshops and Innovation and Entrepreneurship Development Centres (IEDCs). IT, AVGC and manufacturing sector-oriented initiatives offer exposure, mentorship and incubation services. Nevertheless, the paper points to imbalanced participation of rural and urban regions, poor fit between training and industry needs and lack of follow-up on training. Even though the government efforts in skill development have enhanced entrepreneurial capability, it needs to be evaluated on a regular basis, made more accessible and integrated better into the industry to be effective in the long term.

Subramaniyan (2024) discusses the issue of women empowerment, based on the Start-up Village Entrepreneurship Programme (SVEP) in Kerala and critically analyses the opportunities of the program, challenges and the policy implications. As of 2024, SVEP had contributed to the establishment of 129,718 micro-enterprises with 6,887 being founded in 2024-25 and approximately 280,547 people were involved, the majority being women. The paper brings out the two-fold approach used by Kudumbashree to facilitate and empower women entrepreneurs which has enhanced financial literacy, access to credit, and household earnings. Enterprise is also female-dominated with 75 percent of the businesses and 57 percent of the local earnings produced by these activities. Nevertheless, the study presents structural limitations that include poor market penetration, poor infrastructure and the construction of constant skills. Despite the fact that SVEP has greatly empowered female entrepreneurship, the long-term effects would need a continuous policy development, better scalability and enhanced market penetration.

Hansra and Roy (2023) examine the concept of the public-private partnerships (PPP) in the state of Kerala and how it facilitates innovation, infrastructural growth and service provision. The paper identifies some of the successful projects like the Akshaya project that had been implemented in 2002 in Malappuram district that enhanced digital literacy and access to IT by the government and the private sector. PPPs have also improved efficiency, optimised wealth and transfer of knowledge. The research however also mentions complexity in governance, accountability issues and unequal participation by the private sector in different regions. Although PPPs have been used in the socio-economic development and innovation their success relies on explicit regulatory frameworks, sustained funding and community engagement in the long run.

Reshama (2023) discusses the role of government grants, subsidies and incentives in the support of Start-ups and discusses the effectiveness of these incentives in encouraging entrepreneurship and economic growth. Access to finance like seed capital, tax concessions and capital grants have lowered entry barriers and enhanced liquidity among early stage ventures. Kerala Start-up Mission (KSUM) provides a full package of financial grant such as Idea Grants (up to 3 lakh), Productisation Grants (up to 7 lakh), Market Acceleration Grants (up to 10 lakh) and Scale-up Grants (up to 15 lakh). Women and transgender entrepreneurs are also given special incentives with support of up to 12 lakh. The paper points out that these schemes promote innovation, rural entrepreneurship and inclusive growth. There are still such challenges as bureaucratic delays and administrative complexity. Financial incentives help in creating and surviving Start-ups but their success in the long run relies on the consistency of the policy, open administration and the use of other support mechanisms like mentoring, infrastructure and access to the market. The paper highlights the need to have a combined strategy in order to ensure that financial incentives are maximised.

Chivukula (2022) stated that the financial schemes within the Kerala Start-up Mission (KSUM) including Idea Grants (up to 3 lakh), Productisation Grants (up to 7 lakh), Market Acceleration Grants (up to 10 lakh) and Scale-up Grants (up to 15 lakh)

have enhanced access to seed capital and lesser financial obstacles on early-stage ventures. These programmes alongside collateral-free loans of the Kerala Financial Corporation (KFC) and industry incentives have helped with innovation, capacity building and market entry. The research presents some of the main challenges such as bureaucratic delays, unequal awareness of schemes among entrepreneurs and support to underrepresented sectors and rural areas. Despite the positive impact of state-based financial assistance on the Start-up ecosystem in Kerala, the sustainable development of the state needs longer-term policy support, open governance and fair access to entrepreneurial resources.

Syam Krishnan and Rathakrishnan (2022) examined the key issues of Start-ups in Kerala and determined the gaps within the entrepreneurial system of the state. Although the State of Kerala has active policies and initiatives under the Kerala Start-up Mission (KSUM), most of the Start-ups still experience obstacles that influence their sustainability and growth. The issue of financial constraints is still a major concern with various ventures not having easy time accessing venture capital and being delayed in getting government funding. The situation is also complicated by the regulatory complexity that implies various bureaucratic procedures and product certification that impede market entry. Insufficiently skilled talent, especially in the emerging technology is also mentioned as a limitation to innovation and scalability in the study. Poor infrastructure particularly in rural regions leads to unequal development and limits the growth of Start-ups. Moreover, the lack of mentorship and networking opportunities limits the possibility of Start-ups to adjust to the market environment and grow accordingly. Even though Kerala has recorded tremendous gains in the development of its Start-up ecosystem more policy alignment, increased sources of funds and enhanced infrastructure are required to create a more inclusive and sustainable entrepreneurial ecosystem.

Jalaja (2022) reviewed the topic of tax benefits and exemptions in Kerala and assessed their usefulness in enhancing the development of Start-ups and entrepreneurship. The paper reveals that the state level incentives like exemptions on sales taxation, reduction in stamp duties and rebates on income taxes on registered

Start-ups had relieved financial strain and stimulated investment in innovative industries. These steps are in addition to other mechanisms like incubation facilities and state-sponsored grants which enhance liquidity and sustainability of operations. The effectiveness of these policies is hampered by complex eligibility requirements, lack of awareness by the business people and delays in the approval process. The paper concludes that tax incentives play a significant facilitating role in the Start-up ecosystem of Kerala, and its effects can be enhanced by simplifying the process, enhancing information dissemination and linking it with other financial support programmes.

Thomas (2020) observed that the incubation centres play a vital role in assisting the Start-ups through physical infrastructure, mentoring, networking and financial advice. The paper describes other programs like co-working spaces, Fab Labs, industry specific incubation centres. It was also found that the programs sponsored by the Kerala Start-up Mission (KSUM) have shortened the product development cycle, market penetration and innovation. Nevertheless, the research points to the limitations including unequal distribution of incubation facilities across regions, urban-rural inequalities, shortage of resources and poor industry-academia cooperation. Though the Start-up ecosystem in Kerala has been enhanced through incubation infrastructure, the key to sustaining the success of the entrepreneurship is the need to sustain the policy support, equal access and improved connection between Start-up and industry networks.

Antony (2019) assessed the success of governmental financial assistance in promoting Start-ups and innovation in Kerala. This paper reveals that the financial schemes, such as Idea Grants, Productisation Grants, Market Acceleration Grants, and Scale-up Grants as well as collateral-free loans provided by the Kerala Financial Corporation (KFC) under the Kerala Start-up Mission (KSUM) have contributed in a significant way in enhancing access to seed funds and growth funds to early-stage ventures. Such interventions have helped in product development, market growth and operational sustainability especially to technology-based and women-led Start-ups. However, challenges are still there like bureaucratic complexity, awareness among

the entrepreneurs and disparities between rural and urban regions. The results of the study confirm that the long-term effectiveness relies on simplified processes, clear administration and closer collaboration with the market and mentorship supportive systems.

Noufal and Ramachandran (2017) examined the development of the Kerala Start-up Mission (KSUM) and its role in state entrepreneurship and innovation. The paper follows the evolution of Kerala Technology Start-up Policy (2014) to Start-up Policy (2022) and the IT Policy (2023). The paper also verified the advancements in financing support, simplification of regulations and development of infrastructure. Innovation and Entrepreneurship Development Centres (IEDCs), LEAP co-working spaces, Freedom Squares, Fab Labs and the ESG structure are some of the important initiatives which helped to create a sustainable and inclusive Start-up culture. The paper also addresses industry-specific projects like the AVGC-XR Policy (2024-2029) which makes Kerala one of the destinations of creative and technology-oriented Start-ups. These policies have been beneficial in the development of thousands of registered Start-ups, increased incubation and prototyping space. The research highlights that future success will be determined by the flexibility of policies, successful monitoring, scalability and increased integration into the private sector.

2.9 CHOICE OF FUNDING STRATEGIES BY ENTREPRENEURS

The choice of funding by Start-up founders in Kerala is determined by the entrepreneurs in selecting the most effective method of funding their company. They can access personal savings, family and friends, angel investments, venture capital, government grants, bank loans or corporate alliances. They will be determined by the cost of money, riskiness, stage of Start-up and government support. State programmes such as seed funds and interest free loans allow the entrepreneurs to make superior decisions. These aids allow Start-ups to expand in a consistent manner and maintain control as well as decreasing financial and operational risks.

Rai, Prasad and Murthy (2025) followed a critical analysis approach to discuss the Start-up ecosystem in Kerala. The paper determines incubators and accelerators as drivers of the creation of Start-ups. The Kerala Start-up Mission (KSUM) has been

instrumental in nurturing over 6,400 Start-ups, assisted in raising approximately 665 million of funds and also helped in generating almost 65,000 jobs. These organisations offer mentorship, infrastructure and financial assistance. Many of them do not get a follow-on round or do not grow profitably. This states that there is a necessity of having more support and revaluating the current programmes. It is also that, despite the extensive incubators and accelerators existing in Kerala that promote innovation, they have to align their models to the requirements of Start-ups to enhance long-term success.

Salamzadeh (2024) discusses the market position of both angel investment and venture capital in developing the Start-up ecosystem in Kerala. Early-stage funding, mentorship, investor-Start-up relationships Programmes like the Kerala Start-up Mission and the Kerala Angel Network have facilitated these relationships. This has promoted creativity and product creation. Nevertheless, the research has critical weaknesses. The availability of funds remains still biased towards technological ventures. Social-impact and service based Start-ups tend to have shortages of funds. Founders may also be pressured by external investment to grow at a pace that is unsustainable in the long run and dilute founder control. The advantages of angel investors and venture capital are not equally distributed despite the fact that they offer expertise and networks. The paper indicates that there is a need to think more inclusively about funding methods in order to realise the full potential of entrepreneurship in Kerala.

Ritika and Khanna (2024) examined the various models of crowdfunding options in Kerala that Start-ups can use. These are equity crowdfunding, in which ownership is sold reward-based crowdfunding, in which it provides non-financial returns and donation-based crowdfunding, in which it concentrates on charitable contributions. Start-ups are able to access more investors through platforms like Ketto and Milaap. Nevertheless, the research points out a number of problems. The efficiency of crowdfunding is hampered by strict regulations and lack of awareness among investors and the necessity of good digital infrastructure. Irrespective of these concerns, crowdfunding is another source of finance. It comes in handy particularly

with the fledgling businesses within the emerging entrepreneurial ecosystem of Kerala.

Mustafa (2024) investigated the dynamics between Start-ups and incubators along with other involved stakeholders. The research describes the inter-dependent relationships which facilitate growth of service oriented and non-technology Start-ups using the Actor-Resource-Activity (ARA) framework. Among the key discoveries is the fact that bootstrapping is still the most widespread source of finance. This is indicative of low access to external funding. Regulatory barriers, limited access to venture capital and lack of infrastructure especially in the rural regions, are also found to be the major challenges associated with the study. The research also observes lack of mentorship and networking opportunities that are critical in the innovation and a growing business. Despite the good potential of the Start-up ecosystem in Kerala, the study suggests better policy, increased funding options and an enhanced mentorship system to create a more sustainable and vibrant entrepreneurial system.

Salamzadeh et al. (2024) studied the equity financing models of Start-ups in Kerala and discuss their availability and limitations. Capital access has been facilitated by institutions like, the Kerala Start-up Mission (KSUM) and the Kerala Financial Corporation (KFC). KFC has given loans to a maximum of 50 crore at an interest rate of 5 percent. Kerala State Financial Enterprises (KSFE) was the first miscellaneous NBFC in India to reach a turnover of 1 lakh crore in business. The article emphasises that even the non-technology Start-ups lack access to capital despite the existence of large investors. It further observed that the emphasis of the state towards inclusive and sustainable development might not be at all times in line with the urgent scaling requirements of foreign investors. Even though equity financing is a significant factor, the effects are not balanced. According to the study, additional and more locally based financing models that are in line with the developmental priorities of Kerala are recommended.

Sahasranamam (2021) examined the debt financing models of Start-ups in Kerala through the analysis of both benefits and drawbacks. Initiatives like Kerala Start-up Mission and Kerala Financial Corporation were used to provide Start-ups with access

to capital. KFC provides loans up to 50 crore at low interest rates of 5 percent. Kerala State Financial Enterprises has created precedence in exceeding 1 lakh crore in business turnover. These schemes are beneficial to the early-stage companies and promote innovation and development. The study, however, determines structural limitations. Small Start-ups and non-technology are usually limited in access to debt financing. Big investors control the avenues of money and the repayment of the money is very strict and unfriendly to the business. The demand on inclusive and sustainable development by the state can at times come against the demands of rapid scaling of debt financing. The paper concludes that despite the significance of debt financing, its advantages are still desperate and need to be made more accessible and more policy-friendly.

Sindhu (2020) analysed the models of debt financing of Start-ups in Kerala and presents the strengths and weaknesses. Access to capital has been enhanced by the use of programmes like Kerala Start-up Mission and Kerala Financial Corporation. KFC offers loans of up to 50 crore at low interest rate and Kerala State Financial Enterprises has already surpassed the 1 lakh crore turnover mark. These funding systems assist the Start-up firms and facilitate innovation. Small Start-ups and non-technology have less access to financing and the large players of the investment industry take the money. Flexibility in operations can be lowered by stringent terms of repayment. Inclusive and sustainable development promoted by the state might not necessarily be in line with the fast growth needs of debt-based projects. The paper finds that despite the significance of debt financing, its contribution is still disproportionate and needs to be more accessible and policy reformed.

Shetty (2017) draws a comparison between Start-up financing in India and the international market. The research establishes variations on the basis of market maturity, investor behaviour and regulatory environments. In the global arena, Start-ups tend to follow venture capital, angel investment and crowdfunding, which are characterised by rapid scaling and high-risk, high-reward approaches. Airbnb and Stripe were some of the companies that grew internationally with aggressive venture capital funding. In India, Start-ups have been used to bootstrap and depend on family

and friends as a source of Start-up funding. The ecosystem is slowly getting stronger due to institutional venture capital and government programs like Start-up India and funds given by SIDBI. They include the funding of companies such as Ola and Byju at an early stage. Even though, the Indian Start-ups are gradually converging with the international trends, the cultural, economic and policy conditions in the area still influence the financing choices.

Liya (2015) critically discussed how the bank loans and NBFC financing can aid Start-ups in Kerala. Such institutions like Kerala Start-up Mission and Kerala Financial Corporation have enhanced access to finance. KFC has loans up to 50 crore at approximately 5 percent interest. The Kerala State Financial Enterprises was the first miscellaneous NBFC in India to pass 1 lakh crore in business turnover. The research pinpoints the following issues; inaccessibility to funds by non-technology Start-ups and the concentration of finances in the hands of some large investors. The emphasis of the state on the inclusive and sustainable development is not necessarily in favor of the rapid expansion that is linked with the external funds. The research suggests that more can be done to make it more accessible and match funding with the developmental objectives of Kerala.

2.10 ENTREPRENEURIAL SATISFACTION WITH START-UP FINANCE

Entrepreneurial satisfaction in Start-up finance refers to the degree of happiness and confidence of the business people regarding the money spent on their business. It is also pegged on their ability to raise funds by using their own savings, angel investors or venture capital. It is also subject to the funding cost and conditions. The entrepreneurs are content when the financing gives them flexibility, autonomy and efficient business transactions. It is found that satisfaction increases when financial support is used in attaining business goals, growth and long-term sustainability. It demonstrates the extent of satisfaction with the business and personal expectations of the entrepreneur with the available finance.

Bharath (2024) stated that the Bureaucratic delays and financial strain is a significant factor of entrepreneurial satisfaction with Start-up finance in India. Government schemes, bank loan or institutional funding are always accompanied by lengthy

procedures, hard paper work and lengthy approvals that would leave the situation unpredictable and extremely stressful to the Start-ups. This financial pressure can limit the growth, dim the independence and create disappointments even after the funding is eventually secured. It is revealed that entrepreneurs not only enjoy the level of money at their disposal but also the level of convenience, timeliness and predictability of the financial procedures. Consequently, the lack of satisfaction regarding Start-up finance directly depends on the high rates of bureaucracy and slowness of the capital acquisition process which highlights the need to streamline operations and accelerate the provision of capital so that the business output could be enhanced not only, but the levels of entrepreneurial satisfaction could also be increased.

Kulkarni and Satish (2023) analysed the problem of satisfaction with venture capital (VC) investment in Indian Start-ups in terms of the effect on performance and interaction between investors and entrepreneurs. A comparison of VC-backed and angel-backed Start-ups indicates that a majority of the financial provisions of the venture capital get linked to the rapid growth and profits phenomena. Founders of Start-ups in the Start-up cities in India such as Bengaluru and Mumbai note that they are not fully happy as founders: they enjoy the funding and mentorship but could be pressured because of the dilution of equity, loss of control and performance requirements. The paper points out that the founder satisfaction with VC funding is highly interrelated with the correlation between the investor and the Start-up objectives, in which constructive communication and shared vision are both important in enhancing the sense of gain.

Kumar, Farooq and Krishnan (2023) reviewed that bootstrapping is a critical consideration that determines founder satisfaction in Indian Start-ups especially in the initial stages when the financing is limited. This makes entrepreneurs inject their own savings or reinvest their revenue more satisfied due to greater financial control, independence and freedom of choice and do not need to part with equity or face restrictive terms of the investor. Bootstrapping on the other hand has its own issues like lack of cash flow, slow growth and a greater personal financial risk. The overall

satisfaction can decline once the Start-up is not extended to the big scale. The collected data in India shows that the situation is partly satisfied.

Chaudhury and Panigrahi (2019) evaluated the preferences of emerging Start-ups in India with first-time financing in the five Indian states, i.e., Karnataka, Maharashtra, Tamil Nadu, Delhi and Gujarat. The study found that the preferences have conflicting interests between the objectives of the entrepreneur and the mood of the investor. Even though the entrepreneur can increase financing through bootstrapping and personal savings to retain control, investors normally want higher returns like equity or debt that will cause dissatisfaction to both the entrepreneur and investors. The propensity of the Start-ups in Karnataka and Maharashtra towards venture capital was also more because of the developed ecosystems in contrast to the comparable states of Tamil Nadu and Gujarat which were more inclined towards the use of family and angel funding. Start-ups in Delhi were found to have mixed preferences. The paper notes the role of regional ecosystem maturity, risk appetite and strategic alignment in access to early-stage financing in India. This makes it clear that there exists differences in the levels of entrepreneurial and investor satisfaction.

Rao (2021) critically analysed the government programs to support Start-ups in India such as the ease of accessing bank loans on subsidies. The scheme that has been identified in the paper includes the Stand Up India Scheme where loans up to 1 Crore with interest are given to at least one woman or SC/ST entrepreneur per branch of bank or other incentives to the technology driven start ups. The study found that the slowness of the processes, complications in the documentation and the lack of knowledge were the critical issues that restricted the benefits to reach the narrowest group of people who could have otherwise accessed it. Despite the decent structure of the policy frameworks, access to both formal financing and subsidies on the part of entrepreneurs were restricted due to the failure in its practical implementation.

Caliendo and Tubbicke (2020) analysed the long-term impact of the funding options on the entrepreneurial satisfaction by tackling the problem of the Start-up subsidies in the emergent forms of the Start-up communities that remains the topical issue of the Indian perspective. According to similar estimates, the research proves that the Start-

ups with early financial assistance, particularly grants and subsidies of a particular nature are more pleased with the performance of the business in the long term in terms of stability, growth and financial freedom than the Start-up that solely uses its own funds. When these concepts are applied to India, it can be specified that programmes like Start-up India and Stand up India that can also result in the better satisfaction given that they should be developed in the manner that embodies the needs of the entrepreneurship. The authors concerned with that funding going the wrong way whether it is in Germany or India can create dependency, stifle innovation and offload strategic initiative, that explains the necessity for focusing on funding as a means of providing sustainable venture performance.

2.11 RISKS IN START-UP FUNDING

Start-up funding risks include uncertainty and risk of loss when acquiring and utilising finance to start a new business. A financial risk is a situation where the revenue or cash flow is insufficient. Market risk occurs when the product or services fail to generate anticipated demand. Operational risk is caused by bad management and misuse of funds. The equity financing may lead to loss of control and dilution of ownership among founders. Regulatory and compliance risks exist as well in case rules and funding terms are not adhered to. All these risks may decrease the pace of a Start-up development and influence its sustainability in the long run. They are also capable of influencing satisfaction levels of the financial decisions of the entrepreneurs.

Santha (2007) studied the levels of satisfaction related to the state sponsored lending schemes. The research shows that approximately 38 percent of women entrepreneurs in Kerala were found to be highly satisfied with financial support received, and another 39 percent were moderately satisfied. This means that the level of satisfaction with accessibility and lending terms is rather high. Conversely, moderate satisfaction was reported by only 11 percent of entrepreneurs in Tamil Nadu, which shows that there are important regional variations in the effectiveness and coverage of the schemes. The paper highlights that the active financial contributions and the availability of lending networks in Kerala had a positive impact on the entrepreneurial

satisfaction. The same, however, was hampered by procedural and low-level awareness in Tamil Nadu. The results emphasise the role of proper programme implementation in the state level to empower and encourage Start-ups that are led by women.

Sreenivasan and Suresh (2025) found that the of risk dimensions affect the performance of Start-ups in Kerala. Almost 90 percent of Start-up difficulties are caused by a mixture of financial, operational and regulatory risks. The major factors involved are the lack of access to early-stage capital, bureaucracy, fluctuations in the market and reliance on informal finance. Start-ups have limitations to scale because of the mentorship and infrastructure gaps even with the help of incubators. The conclusion made in the study is that these localised risk factors have a direct impact on entrepreneurial satisfaction in terms of finance, operational stability, and growth potential and targeted policy support, better access to funding and strengthening of the ecosystem are necessary.

Agrawal and Padmanabhan (2024) examined the informal financing in Start-up entrepreneurship in India based on data on 319 entrepreneurs. The paper concludes that even though informal sources of funds, including family, friends and social networks offer flexibility of capital and prompt capital, informal sources also come with risks of personal financial burden, pressure in repayment and even interpersonal friction. Highly informal entrepreneurs can be restricted in their growth and access to institutional support making it difficult to grow over time. The authors caution that the entry of informal financiers into Start-up financing should be managed very carefully in order to reduce the risk and increase the long-term level of entrepreneurial satisfaction and sustainability.

Choubey and Devi (2024) discuss the policy risk and regulatory uncertainty on Start-ups with reference to Kerala. The authors observed that most of the entrepreneurs have complaints about complicated compliance processes, changing regulations and irregularity in the interpretation of rules. The paper notes that although the state incentives have a positive impact on Start-ups, bureaucracy is still a problem. The study concludes by stating that the clarity of regulation, simplification and consistency

are essential for enhancing the satisfaction of entrepreneurs and for the sustainable development of Start-ups.

Nath et al. (2024) stated that Kerala Start-up Mission has incubation programmes and other hubs like T-Hub that offer access to digital infrastructure, technical laboratories and investor networks to technology based enterprises. Incubators of agriculture provide field-testing, supply chain advice and advisory services whereas health incubators offer laboratory access, regulatory advice and industry connections. The paper concludes that specialised incubation can help to increase the innovation capability, financial sustainability and the level of entrepreneurial satisfaction in general by providing specific resources and mentorship.

Nigam and Gokhru (2023) examined the financial issues of Start-ups that appeared in the period of the COVID-19 pandemic. The research indicates a decline in investment since the risk aversion has increased leading to liquidity constraint and loss of investor confidence despite government relief mechanisms. Start-ups that relied on informal capital or venture capital were more uncertain which influenced the continuity of operations and strategic planning. Other structural vulnerabilities that were revealed by the pandemic were insufficient emergency funding systems and slow reactions to relief. The authors emphasized the need to develop flexible financing models, transparent procedures and financial support systems responsive to crises in order to become more resilient and to increase long-term entrepreneurial satisfaction.

Raman and Rajpal (2022) analysed the legal and contractual risks that investors and Start-ups in India encounter especially when it comes to mergers and acquisitions (M&A). According to the study, complex funding arrangements, ambiguous contracts and unclear agreements exposes Start-ups to conflicts, monetary responsibility as well as loss of strategic control. Entrepreneurs usually experience challenges with the protection of intellectual property, the rights of investors and exit clauses which can influence the stability of operations and long-term survival. Weak enforcement and little understanding of regulatory requirements in the Start-up ecosystem also contribute to increasing these legal risks.

Trivedi et al. (2021) critically analysed the issues of investors who exit the Indian Start-ups by referring the examples of failed small and medium enterprises (SMEs) and initial public offerings (IPOs). The research concludes by stating that the risk of untimely withdrawal of investors continues to make early-stage investments very unstable although, the government has tried to initiate Start-up investments through Start-up India, Skill India and Pradhan Mantri MUDRA Yojana. The abrupt end of investment may interfere with the financial planning, diminish the business survival and decrease the confidence of the founders in external financing. The authors emphasise that withdrawals by the investors not only pose a threat to the stability of an organisation but also influences the long-term satisfaction of the entrepreneur. The paper indicates that effective risk management systems and effective policies are required to ensure the continued growth of SMEs in India.

Iyer (2020) critically examines venture debt as a strategic financing option for Indian Start-ups. The study explains that venture debt supports the growth of business without causing equity dilution. It allows founders to obtain necessary capital without giving up a large ownership stake, thereby preserving managerial and strategic control. However, the study also identifies financial and ownership risks. Smaller Start-ups may struggle to meet repayment obligations and may become over-leveraged which can affect long-term sustainability. In the Indian context, venture debt has emerged as an important complement to equity financing. Government initiatives such as Start-up India and structured investment frameworks have promoted its use. The study concludes that venture debt helps founders balance funding needs with the preservation of strategic control.

Banudevi and Shiva (2019) analysed the financial risks faced by early-stage Start-ups in India. The study notes that new ventures often face difficulty in accessing institutional finance and therefore depend on bootstrapping or informal sources such as family and friends. Common problems include shortage of working capital, cash flow instability and overdependence on a single funding source. These issues can disrupt operations and restrict growth. Start-ups also face costly debt or equity financing, delays in receiving government support and market uncertainty which

increase financial pressure. The study emphasises that financial risks not only threaten business sustainability but also influence the satisfaction of entrepreneurs with Start-up finance. It highlights the need for transparent and timely financing mechanisms.

Nagayya and Rao (2017) examined the risk mitigation practices in the financing of Start-ups in Kerala. The study highlights the role of government programmes such as the Prime Minister's Start-up Action Plan and state-level funding initiatives in providing affordable finance and reducing early-stage financial vulnerability. Kerala-specific initiatives, including the Start-up Village incubator and MobMe Start-up Village in Kochi, offer mentorship, structured funding, and networking support. These initiatives help Start-ups manage cash flow, operational and market risks. The study concludes that effective coordination of institutional support, strategic financial planning, diversification of funding sources and incubation support can reduce risks, improve growth opportunities and enhance satisfaction with Start-up finance in Kerala.

Panda and Dash (2016) evaluated the risks associated with venture capital financing in Indian Start-ups with particular focus on the relationship between entrepreneurs and venture capitalists. The study explains that venture capital provides essential early-stage funding, mentorship and market access. However, it also exposes entrepreneurs to several risks including loss of control, equity dilution and pressure for rapid growth. Conflicts may arise over strategic decisions, exit timing and performance expectations which can create stress and affect business operations. Limited investor experience and inconsistent governance practices further increase these risks in the developing Indian venture capital ecosystem. The study emphasises the importance of understanding and managing venture capital risks to ensure entrepreneurial satisfaction and long-term venture success.

2.12 ROLE OF BUSINESS INCUBATORS AND ACCELERATORS

Business incubators and accelerators assist Start-ups to enhance their growth and sustainability through provision of resources, guidance and structured assistance. Long-term support is normally provided by incubators. They offer office services, administration, networking and business model and advices regarding product

development. This assistance supports embryonic firms to get ready finance. Accelerators have intensive and short term programmes. Their primary intention is to enable businesses to grow fast, venture into the market and appeal to investors. They tend to give seed funding and mentoring. Incubators and accelerators are both a way of helping to mitigate the risk of Start-up failure. They enhance entrepreneurial capabilities, expand access to finance and enhance innovation. They also assist in establishing good and viable firms.

Rai, Prasad, & Murthy (2025) observed that entrepreneurial growth is supported by the benefits of successful Start-ups in Kerala which received incubation help through more structured programmes and mentorship. As an example, Start-ups developed by the Kerala Start-up Mission and under incubation include Mob Mee Start-up Village (Kochi). that have scaled operations in areas like IT, healthcare and Agritech. The paper reinforces that incubation assistance in Kerala not only boost the survival operations of organizations but also increase their operational efficiency .The study induces a high satisfaction level on the founders concerning the aspects of the finance and strategic decision-making. This illustrates the importance of state-supported and personal incubation programmes to induce sustainable Start-up success in the future.

Gupta an d Sunder (2025) discusses the challenge the business incubation policy and the business incubation landscape in India by asking whether or not the stories of incubation is being celebrated are tall tales or success stories in business incubation stories written by Start-ups. It is clear that although the number of the incubators and accelerators in India exceeds 650, it is only partly successful in developing the Start-ups. Recent successful example is genRobotics incubated at Kerala Start-up Mission. The scale issues still challenge many Start-ups as it suffers unequal resources, bureaucracy and loss of industry integration. The research highlights that there exists gaps in both policy implementation and ecosystem due to which incubators cannot regularly achieve their goals.

Van Weele, van Rijnsoever and Eveleens (2018) observed that the world practices of incubation and accelerators are strongly criticised with the lessons of Western European Start-ups to overcome the difficulties of the initial stages. Even though these

types of programmes assist in breaking resource and operating barriers, the study also reveals that limited international orientation implies reduced global scalability as only 15 per cent of Start-ups have global operations outside Europe after five years. A comparative analysis with international best practices indicates that integration of cross border networks, exposure to international markets, and eases of access to international funds go a long way in enhancing growth prospects. This paper highlights the importance of structured incubation and acceleration program in order to reduce the risks and promote sustainable globally competitive venture creation.

Noufal and Ramachandran (2017) analysed the role of accelerators and entrepreneurship hubs in Kerala and its contribution towards the growth of Start-ups in the industrial economy of the state. The case study points to such programmes as WE Mission Kerala that is oriented to scaling women-led businesses as well as other regional centers that offer mentorship, infrastructure, funding and networking. Accelerators assist Start-ups in overcoming problems in short term, enhancement of business models and market entry especially in fields like information technology, manufacturing and services. The research found that there are several constraints such as limited outreach, resource limitations and unequal access to capital which limit the development of some Start-ups. Hence, it can be stated that accelerators and hubs in Kerala are regarded as significant tools of minimising the risk of Start-ups and enhancing satisfaction with the financial and operational support.

Sharma, Shukla, and Joshi (2014) analysed the corporate incubation in India and determined its effectiveness in helping Start-ups. According to the study, corporate incubators are organised by big corporations and organisations and offer start ups access to finance, technical skills, market experience and corporate connections, which enhance their survival and growth opportunities. Tata Innovation Centre, Wipro Open Innovation Lab and the Start-up program of Infosys are some examples providing mentoring, infrastructure and pilot testing opportunities. The research also indicates some weaknesses in the form of strategic misalignment, reliance on corporate partners and lower levels of entrepreneurial control which can affect the decision-making. In spite of these, the corporate incubation in India has been

identified as a viable platform to foster innovation, mitigate the risk at early stages as well as for improving entrepreneurial satisfaction with financial and operational advice.

2.13 TECHNOLOGICAL INNOVATIONS IN START-UP FINANCE

Technological innovation in Start-up finance refers to the application of computer technology in handling and raising business capital. It consists of FinTech platforms, blockchain, artificial intelligence, and mobile payment systems. Such technologies minimise the reliance on banks and venture capital. They accelerate, open up and democratises financial services. AI-based credit scoring assists in forecasting the risk of early-stage startups more accurately. Smart contracts based on blockchain offer secure and tamper-free funding contracts. Crowdfunding networks such as Kickstarter, Ketto and Milaap assist Start-ups in raising funds through donations by people all over the world. Online lending companies like LendingKart simplify the borrowing process of small businesses. There is also an increase of UPI in India which has minimised barriers to small entrepreneurs. On the whole, technological innovation has provided more sources of funding. It has brought about equality and accessibility of finance. It is particularly useful in such areas as Kerala is a state where traditional funding was not easily available.

Markose et al. (2025) provide an empirical investigation that constructs time-varying FinTech ecosystem quality indices with the help of Confirmatory Factor Analysis during the period 2000-2022. The indicators used in the study are the number of Start-ups, venture capital, FDI and employment. It uses panel and cross-sectional regressions to discuss the effects of ecosystem traits on FinTech and employment in the UK and India. The results demonstrate that the high level of concentration of FinTech activity in London undermines job creation and ecosystem development in the UK. Conversely, the less concentrated ecosystem in India does better in attracting foreign investment and fostering regional FinTech development although it has a weak domestic venture capital and institutional backing. One of the strengths of the research is the statistically sound ecosystem index created using the Confirmatory Factor Analysis which can be used to make a clear comparison across localities.

Nevertheless, the research has shortcomings. It fails to appropriately cover industry-specifics in FinTech, including payments, lending, or blockchain. It also does not qualitatively analyse regulatory and institutional factors that may impact on investor and Start-up behaviour. The use of macro-level indices can conceal the firm-level variations in capabilities, strategies and development levels. In spite of these weaknesses, the work has useful policy implications, particularly the necessity to invest geographically so as to create inclusive and sustainable FinTech ecosystems.

Mohapatra & Samantararay (2024) discuss the adaptation of Kerala to FinTech financing in terms of a multi-dimensional strategy that comprises of institutional support, Start-up accelerators and subsidies. Kerala Start-up Mission offers formal funding programmes and KSIDC extends financial support which facilitates the Start-up businesses. The examples of the ecosystem development include the emergence of Open Financial Technologies as a unicorn. The model is heavily reliant on state-driven efforts and it has little evidence of long-term deep venture capital by the private sector as compared to other large hubs. The infrastructure projects like the Digital Science Park show that they are ready to innovate but long-term scalability might be questionable unless they are more closely connected with private investment.

Klein et al. (2019) present a thorough overview of the new digital financing models, i.e. crowdfunding, peer-to-peer lending and other internet-based models. These systems are proposed as disruptive options to the conventional bank-based financing. The research articulates that online lending platforms are less costly to conduct transactions, enhance transparency and access to more investors especially Start-ups at early stages that struggle to secure conventional credit. In spite of the fact that the paper is primarily based on Europe and United States, its results can be applied to India where the digital lending has been growing at an impressive rate because of the gaps in SME financing and insufficient use of formal credit sources. Indians are using FinTech-enabled lending to fill funding gaps to Start-ups and small businesses with examples of mobile penetration, UPI infrastructure and regulatory support. The research also mentions such threats as data privacy issues, Internet fraud, and over-borrowing, which are particularly significant in new markets such as India. Although the paper successfully describes how the financing sphere is changing during the

digital age, its general approach to analysis could use further country-specific comparisons and institutional restraint analysis.

Zhang (2016) evaluated the conventional discussion on financial and entrepreneurial ecosystems by addressing cybersecurity Start-ups. The research associates industry trend, investment movement and exit behaviour with larger problems of dealing with cybersecurity risks in the digital economy. The study indicates that cybersecurity Start-ups can not only assist in minimising digital risks based on the use of expert forecasting techniques and financial performance indicators, but that the companies also encounter difficulties with funding because of the uncertainties regarding commercialising security solutions. The main strength of the research is the combination of the ecosystem theory and industry-specific risk analysis that allows investors to prioritise investments. The study has shortcomings in the fact that it pays too much attention to the United States and fails to pay enough attention to the emerging markets, including India, where digitalisation is rapidly developing, the adoption of FinTech is increasing and cyber vulnerability is high which presents both opportunities and threats to cybersecurity enterprises. Although, Regulatory systems, consumer trust and cross sector linkages have a significant impact on investment decisions in the developing economies, the paper gives little attention in this matter. The study is a contribution to the understanding of the correlation between finance and cybersecurity entrepreneurship and it can be enhanced with a more global approach and better incorporation of socio-regulatory aspects in the financing of digital Start-ups.

2.14 SOCIO-ECONOMIC DIMENSIONS OF START-UP FUNDING

Socio-economic aspects of Start-up financing are social and economic factors that are associated with the process of raising funds by entrepreneurs. It also examines the impact of this funding to the society. These are availability and equity in finance. They look at the equality in access to funding by women, rural entrepreneurs and disadvantaged groups. They also look at the question of whether Start-ups generate employment and enhance financial inclusion. Start-up finance also contributes to regional and economic growth. The manner in which funds are raised and utilised is determined by cultural values and rules as well as social institutions. These are some

of the factors that determine the circulation of finance in the economy. On the whole, Start-up financing is closely interrelated with inclusive growth and social change.

Lavisha, Kaur & Singh (2025) demonstrates that the access to financing has been boosted among women, SC/ST, and minority entrepreneurs through microfinance, government-subsidised credit programmes and FinTech lending facilitators. In India, other policies like Stand-Up India and Mudra loans have granted credit limits of more than 10 lakh crore credit limit but studies have revealed that only a small percentage can be actually invested into businesses with high growths due to risks of reimbursements and lack of equity support. Even though the research highlights that state-level interventions may be robust, they have been criticised on the ground that structural inequities are present in the framework of mentorship, networks and investor bias and continue to pose an obstacle to scaling.

Gupta, (2024) finds that more than 80 percent of venture fund in India is invested in urban centres and rural entrepreneurs have to largely rely on cooperative banks, self-help groups, and government subsidies. Unlike in rural outreach where digital lending platforms and state programs like the Kerala Start-up Mission have contributed to its rise, there is evidence that the perception of a divide in innovation is on the rise since investors have perceived rural ventures as not only high risk but low returns. The paper understands the geographical gap of investments quite well but they underestimate the potential role of rural social enterprises in Agritech and clean energy industries to generate inclusive growth.

Joshi (2022) explains how social impact Start-ups contribute to the field of working on development purposes and the existing funding gaps that they must address. According to the paper, in India, social enterprises are the driving force of the economy in such sectors as education, healthcare, clean energy. Yet, they are able to secure a venture capital investment less than 6 percent of the time which is not a comparable amount to profit-oriented ventures (more than 20 percent). The core advantage of these studies is that social entrepreneurship is linked to Sustainable Development Goals but this relationship has its negative pivotal issue such as: the lack of models of blended finance mechanisms, the balance between financial gains and social effects. The focus on grant-dependence among them means that there is a

weakness in the structure that presupposes the need of new hybrid funding instruments.

D commerce (2021) reveal that over 70 percent of investments undertaken by venture capital firms in India are concentrated in Delhi NCR, Bengaluru and Mumbai with Dalit and Adivasi entrepreneurs having little access to funds. Despite the fact that the studies raise the problem of structural inequalities, they are likely to lack the analysis of the real policy frameworks of redistributing capital. It is also the focus on the urban-centric elites that brings to the fore the issue of privilege and social capital in the flow of funding but still a more robust empirical basis on how funding is discriminated among rotations of caste and class is still lacking.

Varma (2020) exposes that the investments of the Diaspora particularly the Gulf and the US have contributed to the Start-ups in Kerala, Punjab and Gujarat and the angel funds in the form of remittances and networks through mentoring has become vital supports. One case in point is the one event of the Kerala, during which almost 18 crores of early stage funding via NRI angel networks was secured at the 2018 event, clearing its pipeline at the Seeding Kerala conclave. Although the works note that Diaspora has a potential to democratise funding, it has been criticised as not focusing enough on sustainability due to the episodic nature of NRI funding controlled by personal networks rather than being systematic venture capital pipelines.

2.15 RESEARCH GAP

Most of the research on Start-up funding strategies is qualitative in nature relying heavily on descriptive case study analyses. Such approaches provide depth and contextual understanding they often fall short in systematically capturing measurable impacts and drawing generalisable conclusions. Quantitative studies employing statistical models, funding performance metrics or large-scale surveys remain limited, especially in relation to Kerala. Hence, a clear methodological gap can be identified in the existing body of work on Start-ups. The present study addresses this shortcoming by adopting a mixed-methods design that integrates both qualitative and quantitative approaches. By combining narrative insights from stakeholders with statistical evidence on funding flows, success rates and growth outcomes, the research aims to provide a more comprehensive and balanced understanding of funding

dynamics in Kerala. Most of the available research on Start-up financing in India predates 2015 focusing primarily on the early stages of the ecosystem. Hence, a temporal gap is evident in the literature on Start-ups.

Kerala has witnessed significant policy interventions such as the Kerala Start-up Mission, the launch of targeted initiatives like the WE Mission for women entrepreneurs and the emergence of its first unicorn Open Financial Technologies. These developments mark a new phase in the state's entrepreneurial journey, yet scholarly research has not adequately captured the funding transformations that have occurred in this period. By covering the period 2016 to 2024, the present study fills this temporal void, offering insights into recent funding trends and their implications. Most of the studies on Indian Start-ups' finance in India concentrate on metro cities. Kerala remains under represented despite its unique socio-economic fabric, diaspora driven capital inflows and emphasis on sound and women-led enterprises. These facts are also found to be a spatial and population gap. The absence restricts the applicability of broader findings to the state and prevents a nuanced understanding of how local cultural, political and institutional factors influence funding choices. By focusing on Kerala, the study responds to the population gap in the literature and highlights the distinctive strategies employed by Start-ups in smaller regional ecosystems. Taken together, these gaps, methodological, temporal, spatial and population underscore the need for a localised and comprehensive investigation into Kerala's Start-up funding strategies. The present study addresses these gaps to examine the initiatives of Government of Kerala in providing financial and other facilities for promoting Start-ups with a focus on schemes such as the Kerala Start-up Mission, WE Mission and institutional supports like KSIDC and KFC that aim to strengthen entrepreneurial finance. It further seeks to analyse the choice of funding strategies adopted by Start-ups, ranging from venture capital and angel networks to government subsidies, Diaspora investments and crowdfunding platforms, thereby identifying the determinants influencing these preferences. In addition, the study explores the levels of satisfaction of entrepreneurs towards available Start-up finance, assessing their perceptions of accessibility, adequacy and long-term sustainability of funding channels. Finally, it investigates the multifaceted risks of availing Start-up funding in Kerala, including repayment obligations, equity dilution, regulatory

uncertainties and market-related vulnerabilities. By integrating these dimensions, the study provides a comprehensive evaluation of funding strategies and their implications for the growth and resilience of the Start-up ecosystem of Kerala.

2.16 CONCLUSION

This chapter discusses the review of literature on Funding Strategies of Start-ups in Kerala. The section on International outlook on Start-up Funding highlights global investment trends, cross-border capital flows and the adaption of emerging economies to global models. Moving to Global Challenges in Start-up Funding, the literature outlines persistent barriers such as access to venture capital, risk aversion among investors and macroeconomic uncertainties. The review of Start-up Funding in India captures the rapid evolution of angel networks, venture capital and government-backed schemes, while the Legal and Regulatory Framework for Start-ups in India emphasises the role of taxation, compliance norms and ease-of-doing-business policies in shaping funding access. The section on Funding Strategies in Kerala explores the localised context, examining bootstrapping, bank financing and new-age options like crowdfunding. Kerala Government Initiatives for Start-ups provide insights into institutional support mechanisms such as the Kerala Start-up Mission, WE Mission and sector-specific subsidies. Studies under Choice of Funding Strategies by Entrepreneurs reveal decision-making processes influenced by firm size, sector and risk appetite, while Entrepreneurial Satisfaction with Start-up Finance assesses the effect of funding sources on the growth, autonomy and sustainability. Risks in Start-up Funding examines the issues of repayment, equity dilution and overdependence on external capital. The role of Business Incubators and Accelerators emerges as vital in bridging finance with mentorship and networks. The theme of Technological Innovations in Start-up Finance, such as digital lending platforms, Blockchain-enabled fundraising and fintech ecosystems are reshaping access to capital. The Socio-economic Dimensions of Start-up Funding underscore inclusivity, caste-class barriers, rural-urban divides, Diaspora contributions and gender-focused initiatives in Kerala. The review of literature not only identifies these multifaceted perspectives but also helped in framing the objectives, research questions, methodology and hypotheses of the present study.

Chapter 3

THEORETICAL FOUNDATIONS OF START-UP FUNDING IN KERALA

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3.1 INTRODUCTION

This chapter seeks to make a contribution to the current literature on entrepreneurship and Start-up finance by looking at the theoretical background of Start-up funding. Entrepreneurship has been a major driving force of human development, which has been connected to the innovation and transformation of society since the dawn of time. It has its origins almost 20,000 years ago when the first people in New Guinea started to exchange essential goods with obsidian and this was the beginning of organised exchange. The Agricultural Revolution which occurred in Circa 12,000 BCE further stimulated entrepreneurial action such as settled communities, specialisation, trade and value generation. Merchants and explorers were often early entrepreneurs who took risks and accumulated capital which established the foundation of commerce in the world and the first forms of capitalism. The name entrepreneur can be traced back to the 18th century when it was used by the Irish economist Richard Cantillon who first defined entrepreneurs as persons who take risks to make purchases and sales at uncertain prices.

Since the Industrial Revolution and the modernisation of business practices in the 19th and 20th centuries, entrepreneurship has come to be recognised as a driver of social and economic change which has led to the transformation of societies in all parts of the world. The Indian great tradition of entrepreneurship occurred in the ancient trade cultures and led to the modern developing creative and innovative economy. Despite the involvement of traders and craftsmen in the local trade during numerous centuries, the economic life of the country advanced independently since the middle of the 20th century due to the liberalisation of 1991. The late 1990s and early 2000s were characterized by the boom of the technology-driven business as the global information technology was developed and the use of the internet continued to grow. The

government started an initiative called Start-up India on 16th January 2016 to create a well-developed Start-up ecosystem in the country with 502 registered Start-ups.

India is the third-largest Start-up hub in the world, after the US and China. Start-up India initiative has been in a position to generate 17.3 lakh jobs. India could generate more than 100 unicorn Start-ups and directly impacted industries like fintech, health-tech, edtech and e-commerce by providing globally competitive projects and innovations such as Zomato, Nykaa and Ola. A sound digital infrastructure has been facilitated by programmes like Digital India and UPI. Friendly government policies, tax exemptions, funding-related efforts like the SISFS (with a corpus of 945 crore rupees since 2021) are among the list of others who have enabled business entrepreneurs to be innovative and even grow at a scorching rate and pace.

The Start-ups are becoming very democratic and regionally inclusive with over half of the Start-ups today being conceived in Tier II and III cities in India. The government and major success have made Kerala the best Start-up ecosystem in India. It began its journey by launching the first incubator in 2002 and speeded up with the launch of the Kerala Technology Start-up Policy in 2014. Over the long term of combining financial incentives, which entails rent, seed and patent reimbursements, the government of Kerala established an organisation known as Kerala Start-up Mission (KSUM) to promote sector-indifferent innovation and to provide good intellectual reinforcement. The state has a total of over 4100 Start-ups in 14 districts and above 60 + incubators, 450 + innovation centres and 340 + Innovation and entrepreneurship development cells (IEDCs). Kerala has already referred 2022 as the year of businesspeople and it anticipates fine-tuning 15000 greenhorn Start-ups by the year 2027.

With state-wide programmes, the schemes of grants, the policy of student entrepreneurship, the methods of funds and incubator networks led to a successful entrepreneurial culture that has made Kerala to be a model of capacity building, innovation and Start-up funding in the country. The success of Kerala can be viewed as the contribution of specific policies as well as synergetic partnerships in redefining regional entrepreneurial ecosystems that can be replicated by other models both within India and beyond. Even though Kerala is referred to as a potential next-generation

innovation hub, a majority of the Start-ups in the state continue to find it very difficult to access the necessary funding facilities and manage the available funds in a manner that is much-needed and proficient. Despite the availability of various funding programmes of the government, it is not clear whether the funding needs of entrepreneurs are really met. The founders of Start-ups have to make their own choices regarding the types of funding strategies: whether to boot strap, bank, angel-investment or venture capital since each funding strategy has its own costs, advantages and disadvantages.

The entrepreneurs vary in their level of satisfaction regarding accessibility, adequacy and convenience of the accessible finance. This is compounded by multi-faceted risks such as financial, operational and market-related risks associated with the availing of Start-up funding in Kerala. This may have significant influence on the sustainability and growth of these new ventures. These are the questions that suggest the need for conducting a complete analysis of the funding methods, their topicality and their impact on the entrepreneurial climate in the state. The study, therefore, attempts to examine the initiatives taken by the Government of Kerala, both, financially and through the other support systems for promoting Start-ups in the state. The study also aims to determine the various strategies to be followed by the entrepreneurs in securing funds, assessing their level of satisfaction with the level of availability and performance of Start-up finance and to explore the different complex risks associated with Start-up funding in Kerala such as financial, operational and marketing risks.

3.2 GLOBAL START-UP SCENARIO

Today the Start-ups are global organisations that are changing industries, enhancing innovation and influencing the economy at large. The Global Start-up Ecosystem Report 2025 indicates that the world map of innovation has tremendous changes. Asia and Africa are robust growth regions, given that some of the older hubs are under-performing with regard to growth. As a case in point, Bengaluru became one of the 20 best ecosystems in the world, at 14th position in 2025 after gaining seven positions in a single year compared to London which fell to the third position. It is only Beijing, Los Angeles and Tokyo that experienced any growth in the ecosystem value as of this

time. The unicorn landscape (i.e. the private companies whose valuations are above one billion dollars without money) has also changed remarkably fast. By the year 2024, the total of the top 100 unicorns in the world amounted to 10 per cent up to \$ 2.054 trillion.

The AI-oriented firms substituted the leadership role of FinTech as the largest category, offering 27 per cent of the total value. Over 523 countries and 307 cities worldwide have also increased the number of unicorns to over 1,523 by the year 2025. The second count is of more than 1,550 unicorns, 780 in the US and 281 in China and 86 in India. It has changed the pace of new unicorns creation. The number of companies that have made the unicorn status reached 110 in 2024 compared to 100 in 2023. Sixty-five of these new unicorns were headquartered in the United States were AI, Infinite Reality and Perplexity. By the end-year 2024, there are 1,867 unicorns in the world (1,857 in 2023). This was a small growth compared to a record high that was in 2021 when 721 new unicorns were formed. By industry focus, 43% of new unicorns in 2024 were AIs, 29% of them were FinTech and crypto, and 14% of the Start-ups were enterprise software.

The flow of funds has become more volatile. It is highly likely that the amount of investment in venture capital in the world will reduce more than twice than the amount invested in 2022, triggering a decrease of over 663 billion dollars in 2023. The decline of Asia-Pacific was steeper with the region achieving a 40 per cent decline thus becoming the lowest in the last nine years. The capital investment in some of the industries continued to be high. During the month of May 2024 alone, AI companies raised 12.4 billion which was 40 per cent of the total venture capital raised in the world in the month. Cybersecurity Start-ups also saw a sharp recovery with venture capital investment in the security product market of \$2.7 billion in the first quarter of 2025, a 69% recovery over the previous quarter which reflects the growing acceptance of AI technologies in the security product market.

Various institutions have been influencing the policy and funding regimes of Start-ups around the world. The date of the innovation projects funded by the World Bank and International Finance Corporation (IFC) can be traced back to the late 1980s. The

latter examples of the recent innovation projects are the 2021 project titled the Digital Entrepreneurship Project, which facilitates the Start-ups in developing economies. The Occupational Economic Co- operation and Development once again published its first report on Entrepreneurship at a Glance in 2011 which established the world standards regarding innovation and new business establishments. Another legal framework provided by the United Nations Commission on International Trade Law (UNCITRAL) in 1966 to its members has also promoted Start-ups in the cross-border investment and safeguarding intellectual property. In March 2016, the World Intellectual Property Organisation (WIPO) switched on the WIPO GREEN platform to support technology Start-ups to access markets and financing.

The 2017 G20 Leaders statement as adopted in Hamburg recognised the contribution of Start-ups as a driver of the overall economic growth in a globalised world and asked better collaboration between states to enhance the funding of innovation. Even in the face of economic head winds, cross-border investment has been able to survive. India became the third largest funded nation in the first half of 2025 in terms of tech Start-ups with \$4.8 billion. The exclusion was transportation and logistics which collected more funds of 1.6 billion during the period which was an improvement of 104%. The mergers and acquisitions also did not indicate any retardation because they reflected a sign of high strategic consolidation of the Start-up markets in the international setting. The future state of an international ecosystem of Start-ups in 2025 is characterised by the growth of unicorns in the high-value segment, a boom in certain spheres of investment and geographic flows towards new spheres of innovation. Even though the list of funded projects has experienced the increasingly discriminating attitude in the context of the further investment, AI and the entire industry concerning technology do not cease to receive gigantic investments. This dynamic landscape has been driven by world organisations, policy regimes and legal harmonisation and is an important lesson to regional ecosystems like Kerala where lessons on global modes of financing and corporate governance can be applied to create more efficient Start-up financing policies.

3.3 CONCEPTUAL UNDERSTANDING OF START-UPS

Start-ups are new businesses that seek to generate and provide new products, services or business models into the market. They are also defined by the fact that they are innovative, risk-takers and able to adapt to the shifting market conditions. Start-ups tend to come up as a reaction to the determined needs of the market or the availability of opportunities and they contribute significantly to the economic growth, employment and innovation. The Start-up ecosystem is dynamic and complicated and it entails numerous stakeholders such as the entrepreneurs, investors, customers and policymakers. The analysis of Start-ups in the frame of this work includes the analysis of their funding strategies, entrepreneurial orientation and Start-up business environments. Start-ups in India especially Kerala, face unique challenges and opportunities including accessing of funds, talent acquisition and regulatory compliance.

3.3.1 Definition of Start-ups

Start-up is one of the terms that is widely explained as a new business venture established to develop a unique product, service or process and bring it to the market in an attempt to solve a specified problem in a new and captivating way. Policy formulation of what is considered a Start-up in India has been a chain of policy milestones. It was formally defined in 2016, when the Department of Industrial Policy and Promotion (DIPP, now DPIIT) under the Ministry of Commerce and Industry, published the Start-up India Action Plan on 16 January 2016 that defined a Start-up as a company incorporated as a Private Limited Company in India as per the provisions of the Companies Act, 2013, a partnership firm as per the provisions of the Indian Partnership Act, 1932; or a Limited Liability Partnership (LLP) as per the provisions of the LLP Act. In May 2017, the definition was amended to permit the age limit to be at seven years (or ten years in case of biotechnology Start-ups) and retain the turnover limit at 25 crore rupees. In February 2018, this turnover threshold was raised to 100 crore and the age limit was kept at ten years when the project is biotechnology and seven years when it is in all other sectors but again did not correspond to the status change on the split-up or reconstruction of an existing

business. Since 1st December 2017, the Patent (Amendment) Rules, 2017, which is likewise founded on the DPIIT definition provided the same advantage, expedited examination and fee exemption on intellectual property benefits to the qualified Start-ups.

Today, according to the latest notification issued by DPIIT dated 19 February 2019, a Start-up may be up to ten years old (seven years, prior to the changes made in 2018, in non-biotech sectors), it should not have exceeded 100 crores in any given financial year, in terms of turnover and must be involved in innovation, development, or improvement of products, processes, or services or have a scalable business model with a very high potential of creation of employment or wealth. This is another liberalisation of Start-ups in the academic text that further characterises it as a new and resource constrained, high growth venture that is driven by innovation that fits within the legal and policy environment of India.

3.3.2 Characteristics of Start-ups

The Start-ups are a new innovative element in the contemporary global economy that has led to innovation and transformed the market structure of numerous markets throughout the globe. Unlike traditional business which is anchored on predictability and continuous growth, Start-ups demand nimbleness and thinking big. They are also innovative in that they strive to create and bring new products or services to remedy the already existing problems in a different way they are scalable since they can expand at a high rate without an equal increase in costs; take risks and participate in the market. Disruption in which they threaten or provide substitutes to the existing competitors in the market. The global adaptability, ability of the firm to change directions quickly, the market dynamics of the technology-driven strategy, which involves the adoption of digital platforms and the use of artificial intelligence (AI) and automation to create efficiency, customer-centric, networking and collaboration are all part of the Start-ups around the world, where the firm seeks expedited growth by developing products based on the user experience and consumer needs. Start-ups are the centre of economic change, both in Silicon Valley, Shenzhen or Tel Aviv and have the eight mutually-reinforcing aspects. The ability to thrive in an uncertain world

and in disorienting industries, which are as various as healthcare, energy and education.

India, which is the 3rd largest Start-up ecosystem in the world today after the United States and China, makes it possible to sketch why these 8 characteristics are transforming the economic landscapes of nations. The Indian Start-ups are also paying more attention to the innovation dimension introducing low-cost medical solutions, the digital payment set-ups and Edtech infrastructures that fit the demands locally and internationally. The discoveries of unicorns such as Flipkart, Zomato and Byju can also be viewed as scalability because they developed models that could benefit millions of people. Indian entrepreneurial spirit is the capacity to make risks where entrepreneurs explore high entry industries like fintech and Agritech despite regulations. They can scarcely be questioned as market disrupters the Paytms have shifted the principles of banking and OYO did it to the hospitality sphere. Another positive aspect is the flexibility whereby the Start-ups can switch gears very rapidly during some such circumstances like during the COVID-19 pandemic, switching to telemedicine or online education services. The model of tech can be observed in AI-driven platforms, Blockchain solutions and SaaS models that have been dominating the sphere of innovation in India.

Customer-focused and affordability-oriented Indian Start-ups are still customer centred and focus on accessibility and convenience to a vast population with diverse needs. Finally, network and collaboration has been promoted by access to international venture capitalists, accelerators, and government-sponsored incubators including Start-up India and Atal Innovation Mission, thus growth. All these eight attributes can be viewed as the pillars of the vibrant ecosystem of India and hence there is an adventurous spirit that will not surrender to compete in the global arena. It is therefore a unique initiative in the national context that Kerala has undertaken by raising nurturing Start-ups that are socially responsible and consequently inclusive in growth, despite having the same eight attributes. The innovative ecosystem in the state is promoting the young entrepreneurs especially to take the plunge in some of these new fields such as renewable energy, Agritech and health-tech through Kerala Start-

up Mission (KSUM). Summative to the disturbance in the market, in Kerala-based Start-up is transforming the traditional industries by providing digital models in tourism, education and agriculture industries. They are also flexible in terms of their fast adaptability to new technologies and their ability to reposition and align themselves with the global trend, in addition to satisfying the locals.

Specifically, attention is paid to IT, AI and IoT solutions that are able to address everyday problems. Transformational customer-centricity is also promoted, as the majority of Start-ups are initiated with the purpose to meet the immediate demand of a community in terms of healthcare rates or food production that is environmentally friendly. Finally, networking and collaboration is also demonstrated by Kerala as it is actively working on becoming part of the global Start-up ecosystem.

3.4 START-UP ECOSYSTEM

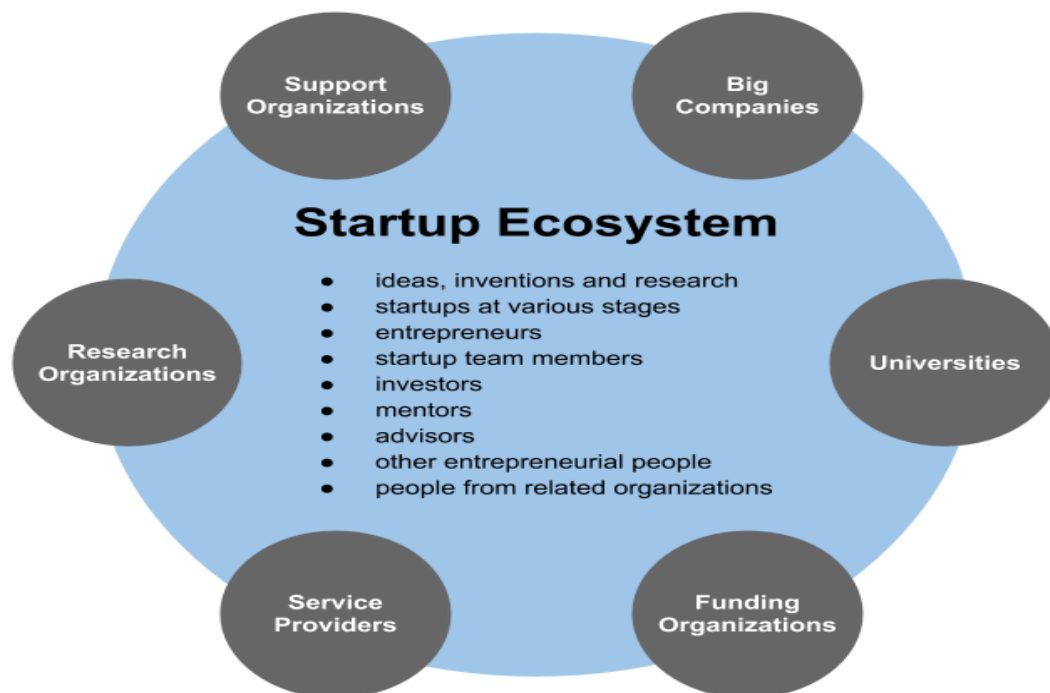
Start-up ecosystem is the dynamic network of organisations, individuals and resources which, in totality facilitate the growth and development of Start-ups. The Start-ups are new businesses that are still in the early stages of development focusing on innovation and scalability. Investors such as venture capitalists, angel investors among other funding agencies are very important because they extend the financial support needed to ensure that these ventures prosper. Mentors and industry experts provide great guidance, strategy tips, and insights which are grounded on their personal experiences. Incubators and accelerators also enhance the ecosystem by providing the necessary resources like infrastructure, support services and structured programs to the Start-ups to pass through the initial stages. Policies, regulations, and initiatives provided by the governments are also a key factor in the creation of an entrepreneurial conducive environment. Lastly, talent or qualified professionals with the expertise to apply their skills in different fields are necessary to implement business ideas and expand its operations. All these elements are interrelated and create a complex mechanism that promotes innovation, entrepreneurship and economic development.

Besides these elements, the power of networks and cooperation in the Start-up ecosystem cannot be overestimated. A healthy ecosystem is one that lives on the interrelations among its actors with knowledge sharing, alliances and joint innovation

having multiplier effects. Networking platforms, industry associations and Start-up events help in meaningful contacts between the entrepreneur, investors, policymakers and academic institutions thus enhancing opportunities to grow and expand the market. Additionally, the digitalization of the world and the global connectivity have helped the Start-ups to overcome the geographical boundaries and reach broader markets as well as draw the international investments. Such interconnectedness does not only increase the strength of the ecosystem but also makes it to evolve constantly due to the new technological and economic trends.

Figure 3.1

Startup Ecosystem



3.5 INDIAN START-UP ECOSYSTEM

Start-ups in India are a phenomenon that has increased significantly by making the country one of the dynamic Start-ups ecosystems in the globe. Start-up India was introduced in January 2016 with over 1,80,000 enterprises being identified through the initiative by approximately 21,683 new entrants between the first half of 2025. This growth is a pointer of extremely high business operations in the country.

Currently with a 3rd place ranking in the world as the third highest technology Start-up finance recipient. With a current bid of 4.8 billion, India is proudly holding that position, despite the general deceleration in capital flow. This kind of Achievement indicates the strength and the growing investor trust in the country and gives a solid foundation towards the maturity of the ecosystems in the long run. It is also unbelievable how diversified India has gone in regard to Start-ups.

By the close of the year 2024, the FinTech will have been an excellent participant. India will have 26 FinTech unicorns with a total of about 90 billion dollar value and there will be 6600 FinTech foundations since 2015 or even more. Another giant is online shopping or e-commerce and such well-known brands as Flipkart, Nykaa and Meesho are taking over the national and regional arenas. Enterprise solutions, health-tech and logistics have experienced unprecedented growth as well. With the legal-tech subsector alone boasting nearly 1,000 companies (nearly 780 million dollars in funding) raised so far and experiencing an unbelievable 6,369 per cent growth in funding in 2025.

The current attention to such new verticals as climate-tech, deep-tech (including AI and semiconductors), electric vehicles and space-tech are a prognosis to invest in more future-oriented innovation. A closer look at the image of funding trends in India would be more complicated. In the first semester of 2025, Tech ups raised 4.8 billion dollars in 470 funding deals- 8 per cent annually. The investments in the growth stage exceeded the 2-billion mark, and the mega rounds concluded a 57 per cent growth over the previous period. Especially, the transportation and logistics technology subcategory contributed 104 per cent of 1.6 billion, retail was 1.2 billion and enterprise applications was 1.1 billion. In the most recent times, renewable mobility space has taken over with articles like Erisha E Mobility has raised 1 billion, GreenLine (275 million) and Infra Market (222 million). India also, logged 12 Start-up IPOs and 73 acquisitions in H1 2025, the latter, a 35-per-cent increase over H1 2024, a sign of the ecosystem maturing and being exit-ready at a very rapid pace.

The technology Start-up ecosystem in India had varied trends during 2024-25. The Indian tech Start-ups had over USD 12 billion of raises, which were approximately 20

percent more than that of 2023-24. During 2024-25 there were six new unicorns that came up but the general amount of funds stood low compared to previous peak years. Investor confidence slowly rose due to market stimulus. During the financial year 2024-25, the Indian Start-ups attracted a total of more than 44,000 crore (approximately USD 5.3 billion) in IPOs showing a sign of greater involvement of public markets and institutional investors together with government policy support. Start-up India was initiated in 2016, which provided an ecosystem that was friendly to entrepreneurs. It gave three years' tax holidays, capital gains benefits, a 10,000 crore Fund of Funds, self-certification under various laws of choice and expedited intellectual property registration. More than 1,40,000 Start-ups were recognised officially as of mid-2024. There were approximately 67,000 Start-ups that had at least one female director indicating the emphasis on inclusive entrepreneurship.

In 2016, the Atal Innovation Mission was introduced to encourage innovation and the culture of problem-solving. The mission was to have 10,000 Atal Tinkering Labs in schools and incubation support to 3500 Start-ups in 72 Atal Incubation Centres by 2025. It has also created over 32000 jobs. The Indian Start-up ecosystem has been empowered by geographical diversification. The cities have expanded at a rapid rate though Bengaluru, Mumbai and Delhi-NCR are still the major hubs other cities like Chennai, Hyderabad and Pune have experienced growth. The Tier-2 and Tier-3 cities were also emerging as Start-up centres. The registered new Start-ups are found in smaller cities in large numbers, with the growth of entrepreneurship being decentralised. With high investments like USD 1.3 billion raised by Zepto, Mumbai registered at the highest funding deals in 2024 in comparison to Bengaluru. Nevertheless, Bengaluru remains the most important hub of innovation in India. The Start-up ecosystem in India is currently marked by size, heterogeneity and maturity. Increase in the number of registrations, diversification of funding and increased utilisation of the public markets are the signs of dynamically growing ecosystem. Inclusive development is still enhanced by supportive policies, incubation networks and regional diffusion. These trends at the national level offer valuable information in the analysis of funding policies of Start-ups in Kerala. Kerala is capable of adopting national funding models to fit the regional requirements. This will contribute to the

innovation promotion, better access to finance and the enhancement of the Start-up ecosystem in the state.

3.6 GEOGRAPHY OF INDIAN AND KERALA START-UP ECOSYSTEM

The geography of Start-up ecosystem in India represents a dynamic mix of clustering innovation located mostly in urban metropolitan areas and a slow but steady growth in activity in smaller urban and semi-urban areas. The spread is determined by facilities such as availability of infrastructure, availability of skilled manpower, availability of investors, size of market and government policy support. The mapping of Start-ups has been considerably diversified over the last two decades due to the improved digital connectivity, logistics and state-led entrepreneurship programmes. Previously, the concentration of Start-up activity was excessive in few Indian metropolitan cities. Bengaluru is the Silicon Valley of India since it has been the favourite Start-up destinations in the world. Bangalore is powerful in the domain of software-as-a-service, fintech, deep-tech and mobility solutions. The city is rich in the IT services sector the immediate access to the top research institutions, i.e., IISc and multinational corporation culture guarantee the innovativeness of the city. The NCR, such as Delhi, Gurugram, and Noida, has emerged as a hub of the e-commerce, fintech and consumer internet companies.

Other companies like Zomato, Paytm, and Policybazaar are unicorns that got naturalised in this country owing to the presence of venture capital firms, a large consumer base with a high population and connectivity. Mumbai, the financial capital of India, boasts of prosperous Start-up foundations in fintech, media and logistics. This is because it is near banks, other financial institutions and Media houses which give it the advantage of uniqueness. Hyderabad is also an AI Start-up hub, Blockchain Start-up hub, and life science Start-up hub, and is home to T-Hub, the largest Start-up incubator in India and the pharmaceutical manufacturing industry. Chennai has become an automotive technology hub with Start-ups in the manufacturing industry and SaaS related companies with brands like Zoho and Freshworks being recognised worldwide. Pune has a niche in the IT services, education technology, and engineering design and Ahmadabad and Surat are reinventing textile innovation, manufacturing

and fintech Start-ups. Kolkata generally lags in the Start-up activity, but it is witnessing foodtech and retailtech growth, as well as, cultural content Start-ups.

The other significant trends in recent years are the shift of the tier-2 and -3 cities into new Start-ups centres. The other cities which have experienced influx of entrepreneurs and investors include Jaipur, Indore, Coimbatore and Bhubaneswar. The digital India programmes have made sure that the non-metropolitan entrepreneurs are far more likely to reach national and international markets without having to relocate to an urban centres. The geographical dispersal of Start-ups may also be considered as sectoral strengths. Bengaluru and Hyderabad are now deep-tech and AI, SaaS and mobility centers. The hubs of e-commerce, fintech and consumer technology are in Delhi-NCR and Mumbai. Chennai and Pune lead in the case of automotive, manufacturing and SaaS companies. Other states with well-established niches in solar, sensortech, healthtech, maritime technology, and Agritech in Kochi and Thiruvananthapuram, textile innovation and small-scale manufacturing in Ahmadabad and Surat. The Start-up ecosystems in Kerala are unique because they have a less centralised feature as compared to other Indian states.

Entrepreneurship is not limited to one city anymore but is distributed throughout numerous territories. This is acceptable according to Kerala socio-economic paradigm where development and regional balanced growth have to be included. It has resulted in a mass development which has been promoted by the Kerala Start-up Mission which is the state nodal agency in the development of the entrepreneurship. It is based in Thiruvananthapuram city and assists over 4,000 Start-ups that are funded by schemes and incubation programmes and others with infrastructure support. The port connection IT parks such as Info park and incubators such as Maker Village, Cochin Innovation Lab and Start-up Village have made Kochi to be the major Start-up centre of Kerala. Kochi has developed its potentials in the maritime technology, hardware innovation and IoT solutions based on its industrial base and logistics prospects. Techno Park is one of the largest IT parks in India and it is located in the city, with a number of Start-ups in the field of IT services, healthtech and edtech. The engineering and science colleges within the city also give the city an advantage of having research

organisations nearby and a constant stream of skilled workers as well. Kozhikode is also becoming a trendy destination of fintech, Agritech and healthtech Start-ups.

Entrepreneurship has been facilitated by the fact that there is a Cyber park and increasing number of co-working spaces. Thrissur and Kannur have turned into rural innovation hubs, hand craft and small scale production Start-ups which are often supported by universities and fabrication laboratories. There are several ways in which the geographical model of the growth of Start-ups in Kerala is distinct. It also promotes entrepreneurship in the vicinity of smaller towns instead of having all the resources concentrated in an urban centre. Laboratories that produce fabrics have been established in various districts and this has provided the possibility of carrying out hardware innovation and prototyping in even rural areas within the state. There are many engineering and management colleges where incubation centres are created, and Kerala Start-up mission has incubation centres, which ensure that the entrepreneurs get to be exposed to entrepreneurship at a young age.

The traditional benefits of the state such as the region of tourism, agriculture, fisheries and healthcare are also used by the state to develop Start-ups that can be integrated into its socio-economic needs. Kerala Start-up ecosystem is linked to the national network by contacting high profile events, collaboration with incubators in other states and co-investment with major venture capital firms in Bengaluru, Mumbai and Delhi. The majority of the Start-ups based in Kerala that have their second offices located in metropolitan centres in order to reach wider markets and yet have the main investments located in the state can also be found due to the reasons of cost-effectiveness. Duality allows them to find a balance between the operation costs and growth opportunities. The Start-up ecosystem geography in India demonstrates extremely high concentration in the metros that have been especially fertile in terms of innovation, and steady and substantial growth in smaller cities. Plan decentralised, socially inclusive and sector-oriented is the distinguishing feature of the Kerala, which is an exception in the general context of Indian entrepreneurship. It was the geographical heterogeneity, at the country level and in Kerala, which ensures strength and localised innovation and distribution of economic gain at a broader level.

3.7 START-UP FUNDING

India has a long track record of branding itself as the most active Start-up ecosystem in the world in the past 10 years ranking third only after the United States and China. The Department to promote Industry and internal trade (DPIIT) estimates that current numbers of Start ups registered in India are in 700+ districts, which serve in excess of 0.3 million direct jobs as of 2025. The government initiatives (like Start-up India (2016) and increased Smartphone and internet connectivity as well as the creation of digitally based payment systems with the assistance of the UPI and the expansion of home-grown consumer base have been the drivers of the growth. Investment in Indian Start-ups reached over 25billion in 2022 with the majority of industries such as fintech, ed-tech, e-commerce, health-tech and deep-tech being the greatest investors. However, behind every successful Start-up experience, money is the most significant aspect. The process of developing an idea into a viable business requires different phases of monetary support and all the phases possess their unique resource of funds and investor needs. The pre-seed, seed, series A, series B and equal development describes the financial life cycle of any Start-up which presupposes the necessity of its founders to update their strategies to address the requirements of the market and growth objectives. During pre-seed, founders will often bootstrap or suggest raising capital to friends and family to build prototypes, build feasibility or capture intellectual property.

At this stage, there is also an angel investor or early innovation grants. The median initial level on the subsequent level of finance preceding angel capitalisation takes place at 50,000 to 250,000 dollars across the entire world except 250,000, the median of Austria and Switzerland. Lifesavers are available in schemes like the seed fund scheme under Start-up India or state level grants in India. During the seed stage, entrepreneurs seek funding of between \$500,000 and 2 million by presenting their ideas to incubators, angel networks and micro-venture capital funds. The target of this situation is to locate product-market fit, develop initial traction and develop a believable roadmap. The other milestone which is being funded by Series A involves seeking larger investments (2-15M) by the venture capitalists who expect their

business model to be scalable have already started making initial sales and have the potential to gain bigger market shares. The financing stages are Series B and C, which entails hyper-growth wherein the investment may exceed 50 million dollars. This is geared towards market expansion, brand positioning and scaling of workforce. Subsequent rounds like series D, E, or pre-IPO funding include the introduction of hedge funds and private equity investors to prepare the firm to be ready to go out into the world or have an IPO.

The very process of investment not only imply transfer of power on a financial basis but a process of transformation of ideas to turn market leaders into a gradual process. In the setting of the state of Kerala, these stages of funding can be referred to as the reflection of an ecosystem which is uniquely spaced depending on the strengths in the area and the interventions that the government is undertaking. It has helped to establish it as one of the most government-led innovation networks in India because the KSUM has been able to incubate over 5,000 Start-ups since it was founded. At pre-seed and seed stage, the Kerala Start-ups are eligible to the advantage of KSUM grant schemes (up to 12 lakh at most) and Equity funds and innovation hubs at universities and technology parks. The Khushboo Diaspora network has also contributed to Kerala and has greatly assisted it in providing angel funding to the state with Non-Resident Indians (NRI) also investing earlier on. Genrobotics and SurveySparrow began as Start-ups and then used state-level grants and seed accelerators and then received Series A investments. This is also true of the Entri.app, the learning platform, which underwent the incubation programme with the help of the government and then was multi-million dollar funded in Series A by venture funds located in Indonesia, which talks of the emerging global connect of Kerala. Through their Series B and subsequent Kerala-based enterprises have shrunk to metropolitan hubs like Bengaluru, Mumbai or even overseas and are attracting foreign investment and corporate partnering in the process but they retain a structural relationship to the Kerala incubator ecosystem. The tiered approach to funding shows that even Kerala, which has even fewer sources of private funds than Bengaluru or the Delhi-NCR region can build successful Start-ups through the strength of homegrown state funds, grassroots incubation and proximity to high-quality education that can transform

locally generated ideas into business at international levels.

The funding strategies are critical to the survival and success of Start-ups. The Start-ups are also prone to difficulties in getting funding because of their high-risk profile, limited history of finances, and unpredictability of future. Knowing the funding strategies that are used by Start-ups, researchers and policymakers may discover the possibilities to contribute to the growth and development of Start-ups. This study examines the financing techniques employed by Start-ups in Kerala, India and examine the best methods employed and advise policy and practice. The following are the major funding options for the Start-ups.

3.7.1 Bootstrapping

Bootstrapping is a financing approach where business people use their savings or the income of their business to begin and expand the business instead of depending on other sources of finance like investors or loans. This is the way that founders can maintain complete ownership and control over their Start-up, make decisions without outside interference. Bootstrapping has been regarded as an effective and discipline approach of developing a business, particularly at the onset of the business because it promotes good utilization of resources and financial prudence.

3.7.2 Venture Capital

Venture capital refers to a type of private equity financing that venture capital firms or individuals offer to early-stage high-potential Start-ups in exchange of either equity or ownership rights. Such financing is normally targeted to new business ventures that have good growth opportunities but are risky. Venture capital does not only offer huge financial source but also strategic assistance, mentoring and business contacts to enable Start-ups to grow at an alarming rate.

3.7.3 Angel Investors

Angel investors are wealthy persons who inject capital into Start-ups, mostly at its initial stages of development in exchange of equity or convertible debt. Angel investors provide funds to good business ideas as opposed to venture capitalists who

operate with pooled funds that are contributed by other investors. They usually provide financial assistance, industry knowledge and good business network besides being an invaluable asset to Start-ups going through their early growth stages.

3.7.4 Crowdfunding

The approach enables entrepreneurs to introduce their business ideas or products to the community and receive contributions as a reward in exchange of early access to products, rewards, or equity among others based on the form of crowdfunding applied. Crowdfunding is both a source of financial assistance as well as a marketing instrument to prove the business concept and create a customer base before a full-scale launch. It is also a democratisation of the fund raising process since anyone can invest without necessarily going through the normal fund raising methods such as banks or venture capital firms. In this model of financing, Start-ups collect limited sums of funds through a large number of people.

3.7.5 Debt Financing

Debt financing is a conventional financing approach whereby the Start-ups will raise funds through borrowing of funds through external sources of funds like banks, financial institutions, or government loan schemes with repayment of the principal plus interest over a certain period. This form of funding is not a venture that involves relinquishment of ownership and control of the business and thus an appealing option to founders who want to be able to make all significant decisions.

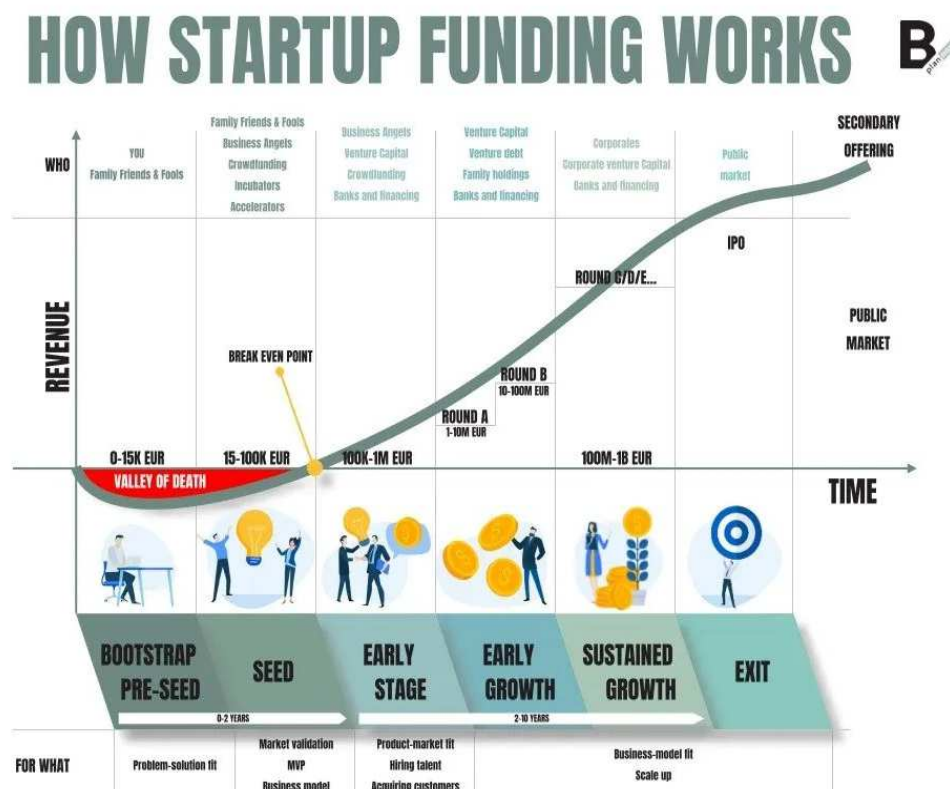
3.8 STAGES OF FUNDING IN START-UPS

Start-up funding is a process with regular steps with each step marked by unique sources and needs. Funding process starts with seed financing followed by early-stage financing, growth financing and finally exit strategy like mergers, acquisition or offering shares to the market. The profiles of investors, risk analysis and capital deployment plans are different at each stage as the needs and maturity of the enterprise change. With reference to developing economies such as India or to be more exact to the regional ecosystems such as Kerala, the knowledge of these stages offers some valuable insights into the processes of Start-up development, the contribution of

institutional support systems, and the strategy of the entrepreneurs when it comes to funding. Moreover, the sequence between these funding levels is not necessarily linear because Start-ups might re-enter the previous financing round or try to combine financing strategies according to the market conditions and business performance. The timing and structure of rounds of fundraising are usually dependent on factors like sectoral focus, potential to scale and regulation. The technology-focused projects can have more significant early-stage financing as they have a high growth potential and social enterprises can be more dependent on grants and impact investors. In ecosystems of Kerala, the interplay between government-backed schemes, venture capital and angel networks highlights the importance of tailored financial instruments that align with the unique socio-economic context of the region. This nuanced understanding underscores the necessity of designing flexible and inclusive funding mechanisms to foster sustainable Start-up growth.

Figure 3.2

How Start-up Funding Works



3.9 FUNDING LIFECYCLE OF A START-UP

Start-up life cycle is distinguished by specific stages, all of which are characterised by changing operational needs, strategic priorities and respective financial needs. The funding path of a Start-up indicates the growth path of the Start-up as a concept up to market establishment and ultimately possible exit. Knowledge of when and how funding requirements change over the course of this lifecycle is essential to any entrepreneur, investor or policy-maker because it does not only define the accessibility of funds but also the way financial strategy should be correctly balanced in line with business goal.

3.9.1 Pre-Seed Stage: Ideation and Concept development

In the first phase of a Start-up which is also known as the pre-seed phase, the business is usually in the form of a concept or experimental thought. The main activities of the entrepreneurs are to determine the validity of their business model, create a Minimum Viable Product (MVP) and to do preliminary market research. The financial needs at this stage are low and critical and are usually focused on prototyping, technology testing and the formation of a founding team. The sources of funds are usually informal in nature and may comprise bootstrapping, personal savings and friends and family. Other Start-ups can also have access to small grants through government innovation programs, universities or Start-up competitions. Any investors at this stage are making very high risks and tend to require a lot of equity to make even minor capital contributions.

3.9.2. Seed Stage: Market Entry and Validation

The seed level signifies the shift between the idea and implementation. At this stage, the Start-ups have already come up with an MVP or rough prototype of their product or service and they start testing it in the market to receive user feedback. It is concentrated on the product refining, creating the first team and creating a customer base. As such, funding needs become huge, and product iterations, market entry plans and early-stage marketing require funding. Angel investors, incubators, early-stage venture capital firms or crowdfunding platforms are typical sources of seed funding

to Start-ups. It is a high-risk situation but with better value propositions and preliminary traction, investors will be more willing to participate. Also available at this stage of financial capital is the support of internal processes and business infrastructure needed to scale in the future.

3.9.3. Early-Stage Financing: Product-Market Fit and Operational Scaling

When the first product-market fit has been achieved, the Start-ups reach the early growth stage which is usually marked by the Series A and Series B investments. The current financial requirements are the expansion of operations, the increase of the customer base, the enhancement of the product offering and employment of the qualified professionals in such essential areas as sales, marketing, and technology. The scale of the funding they need at this point is a lot more, with the Start-ups trying to create brand awareness and gain a competitive edge in the market. The venture capital firms are the new power in funding and they are usually involved in organized investment rounds with clear performance benchmarks. At this stage, Start-ups are supposed to have data-driven growth curves and show the possibility of profitability.

3.9.4. Growth Stage: Growth and Market Leadership

During the growth stage (which is normally the case with Series C and later), Start-ups have now become viable businesses with steady revenue flow and large market share. The goal turns to the market expansion both nationally and internationally and product lines or strategic acquiring. Investment requirements are therefore oriented towards massive marketing efforts, capacity building, technology improvement and efficiency. This is where late stage venture capital funds, private equity firms and strategic corporate investors take a back seat. Start-ups can also consider hybrid financing options including debt financing or convertible notes to finance their capital requirements with a minimal dilution of equity. Start-up valuation has now been pegged on revenue measures, market size and scalability.

3.9.5. Expansion and Pre-Exit Stage: Liquidity Event Preparedness

When the Start-up is close to becoming mature, it is getting ready to have a liquidity event which is generally an initial public offering (IPO) or a strategic acquisition. The

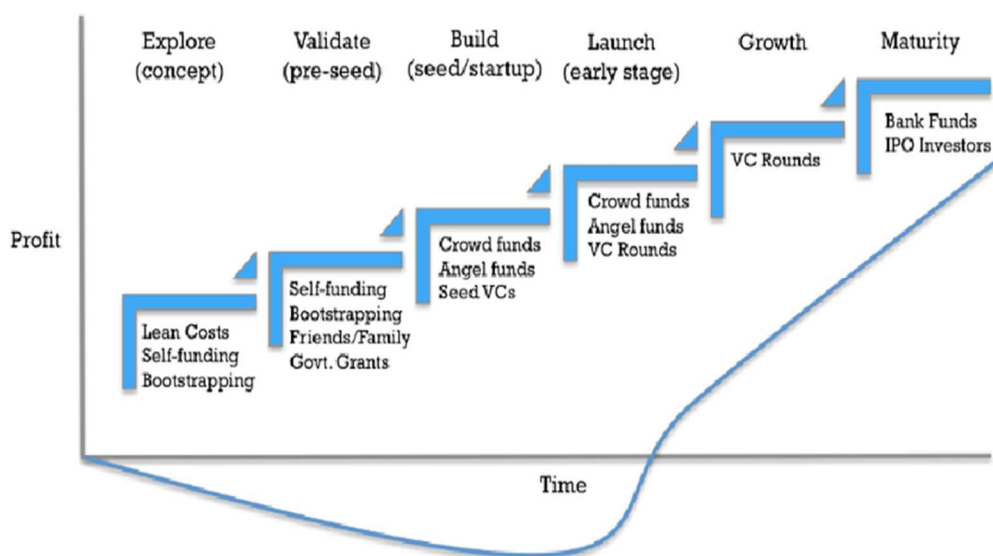
expansion stage is characterised by reorganisation of internal processes to meet regulatory standards, reinforce the governance structures and prepare the business to be subject to investors. The financial needs at this stage are not so much related to operational costs as to positioning and financial engineering. Pre-IPO placements can be done by institutional investors and investment banks and last-mile scaling can receive mezzanine financing by private equity firms.

3.9.6. Exit Stage: IPO or Acquisition

The final phase in the Start-up funding lifecycle is the exit phase, at which the firm goes public via an IPO or it is bought by a bigger company. It is not an initial stage of raising funds to the company itself so much as it is an initial stage of giving back to early investors and unlocking founder equity. The IPO process is very expensive in nature in terms of legal, marketing and financial resources and is usually backed by underwriting banks. Alternatively, acquisition provides a path to a fast exit, in particular of Start-ups with specialised technology or intellectual property. Both of the ways allow the redistribution of capital and the opening of new entrepreneurial opportunities.

Figure 3.3

Life-Cycle of Start-up Venture



3.10 THEORIES OF START-UP FUNDING

The theoretical frameworks and financial models that aid in elucidating the decision-making of entrepreneurs, investor behaviour and the capital allocation dynamics of a high-risk and high-growth environment enrich the study of Start-up funding. The theories provide theoretical insight and analytical instruments to comprehend the way Start-ups can navigate the challenging realm of funding at various lifecycle stages. Their funding decisions are both distinctive and strategically important, unlike the traditional firms, Start-ups experience increased uncertainty, asymmetric information and lack collateral, which makes their decisions unique and strategically important. The theoretical basis of Start-up funding is based on various fields such as the corporate finance, behavioural economics, innovation theory and strategic management.

3.10.1 Pecking Order Theory and Applicability to Start-up Financing

The Pecking Order Theory (POT), which was first introduced by Myers and Majluf (1984), is based on the principle of least effort or least resistance whereby internal sources of financing come first, followed by debt and the issue of new equity. This theory is a challenge to the conventional theory of trade-off which is quite static in terms of capital structure and is based on the aspect of information asymmetry between the managers of the firm and the external investors. Essentially, the managers have more precise and detailed information on the worth of the firm and the future compared to the potential investors. This has the problem of adverse selection particularly when the firm tries to raise external equity.

The Pecking Order Theory and its implications have special dimensions when applied to the Start-up enterprises. Start-ups are mostly in high-uncertainty environments, no operating history, little collateral and high information obscurity. Such traits make the problems of information asymmetry worse and have a strong impact on funding decisions. According to POT, Start-up founders are likely to turn to internal sources of funding like personal savings, family and friends funds or early operations revenue at the Start-up stage. These sources of finance are least influenced by external opinion and valuation issues. Start-ups tend to move to external debt, when available, as the capital requirements of the venture increase especially at the time of scaling or product

development. Nevertheless, traditional debt funding is normally not available or expensive to Start-ups since they do not have assets and a predictable stream of cash. This drawback leads to the violation of the normal pecking order and makes certain Start-ups resort to venture capital or angel investments, although theoretically equity is the final option in the hierarchy. It is worth noting that such decision is not always a choice but can be a necessity rather than an option because of the limitations in other sources of finance.

Furthermore, whereas POT has stressed that companies would not issue new equity because of the risk of undervaluation by the market, Start-ups might consider equity dilution as a way of obtaining the strategic value of equity investors including mentoring, industry contacts and increased credibility. When this happens, the unadulterated version of Pecking Order Theory is tempered by contextual facts and strategic incentives. Empirical research on Start-up financing has indicated inconclusive findings on the applicability of POT in a business environment. It has been suggested by some researchers that POT offers a valuable framework to interpret early decisions on funding but fails to explain later on when the strategic considerations take over the financial pecking order. Others suggest a variation of the pecking order that is unique to Start-ups where internal equity is favored but the second preference is equity of like-minded investors as opposed to debt.

3.10.2 Resource-Based View (RBV) and its use in Start-up Funding

The Resource-Based View (RBV) is a strategic management theory which states that firms achieve and maintain competitive advantage by obtaining and properly utilizing valuable, rare, Inimitable And Non-Substitutable (VRIN) resources. This theory has an internal capacity and resource endowment of a firm as the key determinant of its performance and growth as compared to the external market variables. Considering Start-up funding, RBV can provide a critical perspective to perceive the role of internal resources, either tangible or intangible, in terms of the capacity of the Start-ups to access and use financial resources in an efficient way.

Start-ups, by their nature tend to be resource-constrained. It typically does not have physical resources, large market share or good streams of revenue when they are still

small. Nevertheless, RBV proposes that strategic intangible assets like entrepreneurial expertise, innovation capacity, intellectual property, good founding team dynamics and unique business models may become critical differentiators. The resources are able to lure investors because they indicate that they can generate values in the future. In terms of funding strategy, the RBV emphasizes the role of internal strength of a Start-up in its funding strategy. The Start-up that has a patented technology or a highly skilled team can have a better bargaining power and receive more favourable terms of financing by the venture capitalists or angel investors. These distinctive internal resources minimize the perceived risk to the investors and enhance the legitimacy of the firm in the competitive funding environment.

Additionally, the RBV model suggests that financing is not only a decision based on the external opportunities but also an indicator of the ability of a Start-up to utilize its main competencies. Those entrepreneurs that can explain the strategic benefit of their assets, e.g., market understanding, innovative capacity or entry to niche consumer groups are in a stronger position to attract funding. Investors will also tend to invest in Start-ups that not only have a scalable product/service but one that also has a logical fit between its internal capabilities and its strategic objectives. Also, RBV promotes the emphasis on the capability development after funding. The Start-ups that use funding to enhance its core competencies like enhancing the R&D, developing operational efficiency or increasing human capital, will have a higher chance of attaining sustainable growth. Therefore, RBV do not only determine the process of acquisition of funding, but also its optimal allocation in strengthening the specific competitive advantage of the firm.

3.10.3 Financial Growth Cycle Theory and its Applicability to Start-up Funding

Financial Growth Cycle Theory which is mainly a theory developed by Berger and Udell is a structured approach to understanding how the financing preferences and the availability of capital to firms change over their life cycle. This theory assumes that a firm does not have a fixed financial structure but rather the structure is dynamic as the firm grows, accumulates assets, lessens information asymmetry and develops a track record. In the case of Start-up funding, this theory provides a useful theory to

comprehend the flow of funding requirements and sources at the Start-up stage to the different levels of growth. The theory suggests that there are usually three broad stages that the firms pass through, which include the Start-up or seed stage, the growth and expansion stage and the maturity stage. All of them are defined by varying degrees of risk, information, asset base and creditworthiness that subsequently impact the financing options that are feasible and the most effective to the firm.

During the early (Start-up or seed) phase, companies are usually small, untested and very secretive. They do not have material assets, consistent revenues and past performance records. Consequently, they have serious information asymmetry issues in the capital market and it is hard to get formal debt or institutional equity. In this phase, personal savings, family-friends, bootstrapping or angel investors are usually sources of funding. Such sources are more risk tolerant and dependent on the vision, the credibility and the social capital of the founder, but not on official metrics.

The Start-ups entering the growth stage get market presence, earn income and set the operational base. Having increased transparency and reduced risk, they will be more appealing to venture capitalists, private equity investors and bank lenders in certain situations. According to the Financial Growth Cycle Theory, the presence of this source of funds is directly correlated to the better signaling of value by the firm to effectively manage its operations and clearly show its scalability. Equity financing is usually favored at this point of time to finance quick growth, product development and acquisition of the market.

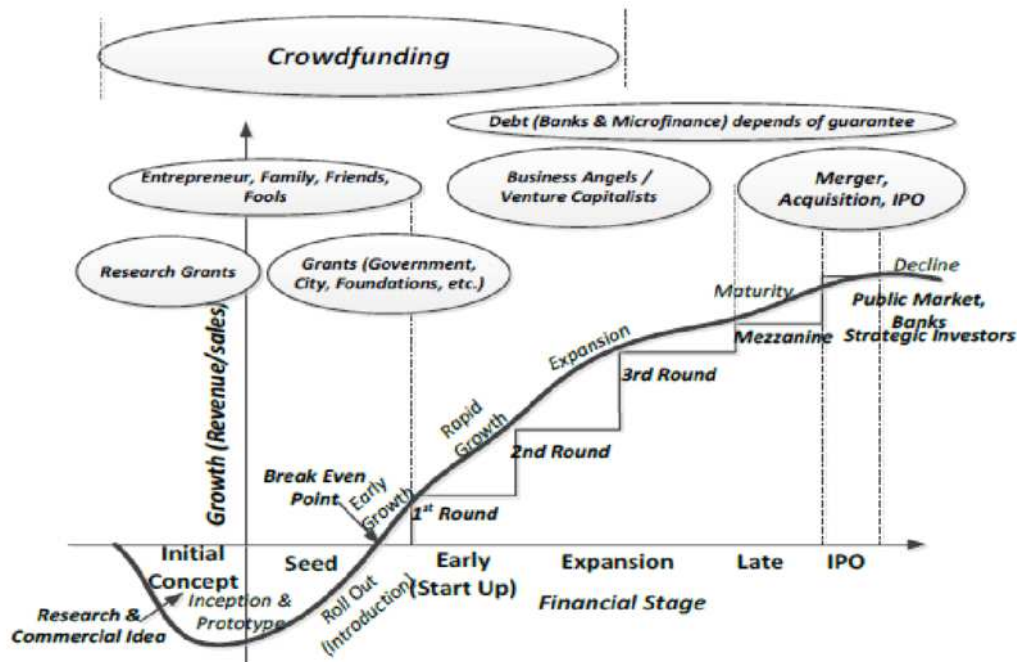
During the mature stage, the Start-ups become more established companies with predictable cash flows, asset bases and formal governance structures. They are now able to access a broader financing source such as commercial bank loans, trade credit and public equity markets as well as corporate bonds. The perceived risk is minimised and the trust of financial institutions is increased thus lowering the cost of capital. This is the stage where companies can change their preference to debt financing where they are able to enjoy the benefits of tax shields and yet be able to remain in ownership. Another important point that the theory makes is that information asymmetry is a critical factor during the cycle. As the companies expand and develop

credibility, the asymmetry between the internal and external stakeholders decreases and the access to external finance increases. The Financial Growth Cycle Theory conforms to the general idea that the nature of financing depends on the specifics of the firm as well as the needs of the stage but not a one-size theory.

In the case of Start-ups, this theory can be used as a descriptive as well as a prescriptive tool. Not only does it explain the dynamics of the funding patterns but it also helps the entrepreneurs to decide the level of funding according to the stage of development in which the firm was. Start-up founders can be able to make sound decisions about the timing, source and structure of capital by understanding their place in the financial growth cycle.

3.10.4 Innovation Diffusion Theory and Its Application to Start-up Funding

The theory of Innovation Diffusion Theory (IDT) is an effective theory of adoption and diffusion of new ideas, products and services developed by Rogers which can be relevant to Start-up funding. IDT states that the process of innovations diffusion is predictable and various categories of adopters play an important role in the process. When it comes to the Start-up funding, one can use IDT to learn how investors embrace and finance new Start-ups and how the latter can enhance their likelihood of receiving funding by showing innovative solutions, good market prospects and clear competitive advantage. IDT infers that Start-ups which can exhibit a strong level of innovation, compatibility and observability have higher chances of attracting investors and securing funding. The Start-ups who can establish good networks and relations with the potential investors, partners and customers can have higher chances of success. Knowing the principles of IDT, Start-ups will be able to create effective strategies to convey their value proposition, create support in the key stakeholders and have a higher chance of getting funding. The use of IDT in Start-up funding indicates that innovation, networking, and communication are essential in getting funded and becoming successful. This study will use the IDT to discuss how Start-ups could use innovation and networking to raise funds and attain growth and will give an insight into how innovation and communication find their place in funding and success of Start-ups.



3.11 INDIAN START-UP FUNDING SCENARIO

Start-up domain in India has increased manifold in the less number of years and 2024 was a year to be remembered in terms of investment. Indian Start-ups got approximately 14.44 billion in 1,337 deals in 2024; this is also a strong recovery in the past years. Bounce back shows that there is increased confidence in the investors and the dynamics of Indian Start-up life are being changed. Indian Start-ups experienced both early-stage investments and growth investments in 2024. The dollar value of percentage of early-stage funding was 3.23 billion using 810 deals and growth and late-stage funding amounted to 11.2 billion using 326 deals. The other (201 in total) rounds were not revealed. Observable in this allocation is the ongoing appeal to new Start-ups and Start-ups which have the same business model which has been experimented. In Big 2024 rounding, there were also Mumbai-based quick commerce Start-up Zepto which raised 665 million in Series D financing at a 3.6 billion valuation. That was supplemented by another \$340 million round two and its total funding in the year 2024 has surpassed 1.3 billion. Similarly, AI Start-up GigaML attracted investment worth 40 million by Redpoint Ventures at a valuation of 350 million which is a sign that investors are very interested in putting money in artificial intelligence and machine learning technologies. Special Invest, a venture

capital fund that invests in deeptech Start-ups only, has raised a 3rd fund of 600 crores (approximately 70 million USD) on top of its original fundraising target of 500 crores (approximately 60 million USD).

The fund will assist in funding 18 to 20 Start-ups in the space technology, advanced manufacturing and quantum computing. The relocation points to the increased interest in investing in high-impact technology-related projects. The contribution of the governmental activities to the blooming of the Start-up ecosystem has been no less. Small Industries Development Bank of India (SIDBI) has already given out 10,229 crore in 129 Alternative Investment Funds (AIFs) under the scheme of Fund of Funds of Start-ups (FFS) which covers 939 Start-ups. The program is aimed at supporting Start-ups, irrespective of the level of their growth and therefore facilitate innovation and entrepreneurship through the provision of financial aid to them. Despite the trends, the Start-up funding sphere still has its disadvantages. The imbalances in funding between regions and industries still occur and certain regions have a higher number of investors compared to others. There is also the new legal environment and the rate at which the Start-ups are expected to scale up to attract capital. The Indian Start-up ecosystem has a positive outlook into the future. The financial support and good government policies combined with the growing number of innovative entrepreneurs makes India a stiff competitor in the global establishment of Start-ups. Further focus on industries including fintech, healthtech and deeptech and the unabated interest of investors will presumably result in further growth and expansion in the following years.

3.12 THE KERALA START-UP SCENARIO

Kerala start up ecosystem is at a crossroads of demographic potential and innovation potential. The literacy level in the state is more than 90 percent. This has developed a knowledge based and skilled work force. In Kerala, entrepreneurship has become the preferred choice of many youths as compared to regular jobs. With the blessings of digitally conscious population, Kerala offers a Start-up friendly environment for commencing technology-based businesses. The state possesses more than 3,500 operational ventures, showing a gradual increase in the ecosystem in recent years with a rate of growth of approximately 20 percent per annum. The state of Kerala has

helped more than 6,400 Start-ups which have created almost 65,000 direct employment. Innovation and entrepreneurship programmes are carried out annually among 100,000 students approximately. All these indicate the evidence of a solid foundation for technological entrepreneurship in Kerala. The state has developed fibre-optic connections and large IT parks like Technopark, Infopark, SmartCity and Cyberpark. Technopark also has more than 500 companies and approximately 80,000 professionals. Women make up approximately 45 percent of workforce in Technopark. The campus has registered high growth in the employment and business within the past five years of its establishment.

Infopark Kochi, which was created in 2004 has also expanded considerably. It has over 580 companies and approximately 72,000 professionals in 2025. The campus has more than 9 million square feet but it keeps growing. Upgrades in infrastructure and renewable energy should expand its number of employed professionals to over 100,000. The existence of international companies has enhanced corporate and start up systems. Digital connectivity has been enhanced by Kerala Fibre Optic Network (K-FON) which was introduced in 2021. It is geared towards offering affordable and universal internet. The project relies on a high fibre network to facilitate the digital governance, online learning, telemedicine and online entrepreneurship. This has minimised the digital divide particularly in the rural regions and facilitated the growth of Start-ups.

The Start-up ecosystem value in Kerala stood at approximately USD 1.7 billion by 2024- 25 indicating a good growth. The state is excellent in low cost talent, knowledge base and cost efficiency. The government policy has been focusing on new areas like Artificial Intelligence, robotics, blockchain, big data, life sciences and in advanced manufacturing. The infrastructure investment in life sciences rose in 2024-25 and semiconductor and AI Start-ups as well as deep-tech Start-ups have started to receive early-stage investment. Education is also increasing innovation. The Industry-on-Campus programmes allow students to be exposed to the real world of manufacturing and technologies in 2025. This improves the pipeline of talent in the future. Innovation is still funded by the government. The state budget provides funding towards AI, digital infrastructure and Start-up incubation on an annual basis. Kerala has also enhanced access to finance by offering Start-ups loans without collateral by the

financial institutions. Infrastructure development on new innovations is also in progress. Entrepreneurs are offered collaborative spaces within innovation hubs, co-creation centres and digital incubation spaces.

Altogether, the Start-up ecosystem in Kerala is conditioned by the high level of human capital, developed infrastructure and favourable policy. Innovation is made possible by high literacy, institutional support and active participation of skilled workforce both in the urban and rural areas. Physical, digital and educational infrastructure collaborate to help in various phases of Start-up development. Government investment, international cooperation and technology oriented industrial developments are continually increasing opportunities. The state funding mechanisms have to leverage its talent, infrastructure and innovation strengths. Sustainable growth, scalability and inclusive entrepreneurship can be encouraged through effective funding strategies. Now Kerala has become a major innovation-driven Start-up center in India with more than 7,000 registered Start-ups, a thriving incubator network and an increasing number of angel investors. The further development of the ecosystem is projected to be maintained by the continued policy support and the investment of innovation.

Figure 3.4

Snap shot of State Performance



Source: Government of India, Ministry of Commerce and Industry, Department of promotion of industry and internal trade- States Startup Rankings- 2024

3.12.1 Kerala Start-up Mission (KSUM)

Kerala Start-up ecosystem is marked by a wide variety of the key players which lead to its development and evolution. First among them is Kerala Start-up Mission (KSUM), the central authority in promoting innovation and entrepreneurship in the state. KSUM is a key player in encouraging Start-ups, availing funds to Start-ups and offering them a conducive business environment. Incubators like the Technology Business Incubator (TBI) is an important source of support to early-stage Start-ups providing infrastructure, mentorship and resources with which to develop. Accelerators in turn offer intensive assistance to Start-ups and allow them to expand their operations and attain a high growth rate. Academic institutions (universities, research institutions) are also important stakeholders in the ecosystem as they contribute talent, research and innovation that feed into the Start-up pipeline. These institutions also cooperate with Start-ups which offer the prospect of knowledge transfer, collaborations in research and acquisition of talents. The interaction of these important stakeholders forms an exciting ecosystem that fosters growth and development of Start-ups in Kerala where they can innovate, scale and succeed.

3.12.2 Start-up Domains in Kerala

Among the highly literate and socially developed states of India, Kerala is now a rising Start-up activity center due to the active government policy, the presence of an educated talent pool and the growing digitalisation of the economy. Kerala Start-up Mission (KSUM) is the nodal agency of entrepreneurship development in the state that has been pivotal in creating the Start-up ecosystem through innovation, provision of infrastructure and access to financing and mentorship. With the maturation of the ecosystem, certain Start-up domains have become more visible which is in line with the socio-economic setting, resource and technological developments of the state.

3.12.2.1 Information Technology (IT) and Software Solutions

IT remains a prevalent area in the Kerala Start-up ecosystem. Some of the Start-ups performing well in Kerala include: software development, web applications, mobile applications, cybersecurity, cloud computing and enterprise solutions Start-ups. Such

ventures have been given physical infrastructure and networking opportunities by the Technopark(Thiruvananthapuram), Infopark (Kochi) and Cyberpark (Kozhikode). The high presence of IT professionals and software engineers is a boon to Start-ups that provide SaaS (Software as a Service), EdTech, HR solutions and fintech applications.

3.12.2.2 HealthTech and Biotechnology

HealthTech is a critical area of Kerala, especially after the COVID-19 pandemic. Start-ups are using Artificial Intelligence (AI), IoT (Internet of Things), and telemedicine to fill the gaps in healthcare delivery, diagnostics and remote patient monitoring. The high level of infrastructure in the public health of Kerala and the medical education institutions have facilitated the joint efforts of the health experts and the business people. Also, the Ayurvedic culture of the state has contributed to the development of biotech Start-ups that deal in herbal and natural wellness products, medical research and diagnostics.

3.12.2.3 AgriTech and Food Processing

AgriTech Start-ups have established a good niche considering that the state is agrarian and oriented towards organic and sustainable agriculture. The innovations of precision farming, supply chain optimisation, agri-input marketplaces, farm analytics and food traceability are on the rise. The special products of agriculture like spices, coconut and banana and increasing popularity of value-added food processing have triggered Start-ups in this area in Kerala. The Krishi Start-up ecosystem supported by the government also encourages this industry.

3.12.2.4 Tourism and TravelTech

The fact that Kerala is the Gods own country offers good opportunities to Start-ups in the tourism and hospitality sector. TravelTechstartups are creating AI tour planners, sustainable tourism solutions, homestay agents and experience tourism solutions. Focus on eco-tourism, heritage tourism and wellness retreats are domain specific opportunities of Start-ups that combine digital technology with the real cultural experience.

3.12.2.5 Education Technology (EdTech)

The large literacy rate and focus on education in Kerala has facilitated the growth of the EdTech Start-ups. The industry is growing at a quick rate with platforms of K-12 and test preparation applications along with language learning and skill development platforms. Online learning has increased the urgency due to the pandemic and local innovations are being national and international.

3.12.2.6 CleanTech and Renewable Energy

The sensitivity and sustainability agenda of Kerala has led to increased development of renewable energy Start-ups, especially solar energy, energy efficiency solutions and waste-to-energy technologies. Some of the areas that are being innovated by Start-ups include smart energy grids, water purification, waste management and electric vehicle (EV) infrastructure.

3.12.2.7 E-commerce and RetailTech

Start-up companies in Kerala that deal directly with the consumers are also using the e-commerce platform to serve niche markets. In this sector, Start-ups are trading in the business of ethnic clothes and organic food to the craftsmanship and books. The models of regional support of language and hyper-local delivery are becoming the key distinguishing features.

3.12.2.8 Logistics and Mobility

Last-mile connectivity, fleet management and logistics aggregation services are being investigated by Mobility Start-ups. Smart mobility solutions based on electric cars, ride-hailing applications and delivery logistics become increasingly popular in such cities as Kochi and Thiruvananthapuram in particular with the introduction of Smart City programs.

3.12.2.9 FinTech and InsurTech

Financial technology Start-ups in Kerala have emerged and specialise in digital payments, micro-lending, wealth management and financial inclusion. As more

people gain access to the internet and mobile devices become more widespread, FinTech Start-ups are penetrating underserved communities, particularly those rural and semi-urban communities.

3.12.2.10 Social Impact and Women-led Start-ups

The focus on social impact ventures, particularly those that address health, education, skill development and sustainable livelihoods is also on the increase in Kerala Start-up ecosystem. Start-ups that are led by women are becoming more visible and schemes such as WE Mission Kerala and mentorship networks promote the inclusion of women in entrepreneurship.

3.13 SUPPORT SYSTEMS OF START-UPS IN KERALA

Start-up ecosystem in Kerala is typified by a strong support system encompassing accessibility to co-working spaces, financial support and mentoring. Co-working spaces offer Start-ups with joint office space, networking and collaborative atmosphere that promotes creativity and development. The financial support can be provided in different ways such as government funding, venture capital and angel investors, whereby Start-ups can get the resources required to grow and expand their businesses. Mentoring is important in steering Start-up through the roughs and the risks of entrepreneurship as the experienced professionals and experts in the industry would provide valuable insights, advice and support. These are support systems that are collaborating to establish an enabling environment of Start-ups in Kerala and enable them to rise above the challenges to reach their targets and help in the economic development of the state.

3.13.1 Co-working Spaces: Catalysts of Collaboration and Innovation

The emergence of co-working centres in urban centres and semi-urban centres in Kerala has been a major factor in creating a decentralised yet networked Start-up culture. Such spaces are not only physical infrastructure but they provide the environment that allows creativity, learning with peers and cross-domain learning. Start-ups with just a desk to one in scale-ready businesses, co-working centers are

offering flexible and affordable work spaces with full amenities including internet connectivity, meeting rooms and business services.

Kerala Start-up mission (KSUM) has set up a number of government sponsored incubation centers and FabLabs (Fabrication Laboratories) in major cities such as Thiruvananthapuram, Kochi, Kozhikode, and Kannur. It is worth noting that the Integrated Start-up Complex in Kochi, one of the biggest Start-up centers in India, houses hundreds of Start-ups representing different fields of interest under a single roof. Such co-working ecosystems provide interconnectivity amongst entrepreneurs, investors, mentors and technologists. Additionally, non-governmental organizations and social enterprises have also ventured into the co-working sector, providing services to niche markets, including women-led businesses, the creative industry or sustainability Start-ups. Such environments greatly lower the capital spending of early-stage companies and encourage problem-solving in the community.

3.13.2 Financing Assistance: Mobilisation of Financial Resources towards Innovation

Capital availability is a critical success factor of Start-ups. The Start-up ecosystem in Kerala has witnessed the creation of a stratified funding structure that encompasses government grants, seed funds, Venture Capital (VC), angel investors and other financing structures such as crowdfunding.

KSUM has a number of funding schemes including:

- Idea Grant and Productisation Grant: Seed funding of Ideation-stage and prototype-stage Start-ups.
- Scale-up Support: To Start-ups whose revenues have potential such as Venture Capital funds via programmes such as the Fund of Funds initiative.
- Innovation Grant to Women and Student Entrepreneurs: Promoting inclusivity in entrepreneurship.
- Start-up Box and Challenge Grants: To develop products with a problem-solution approach in such areas as AgriTech, HealthTech, and EdTech.

Moreover, KSUM has also formed collaborations with angel networks, institutional investors and banks to facilitate access to early and growth-stage capital. South Indian based Start-ups are gaining more traction with Investments by private angel networks such as Kerala Angel Network and VC firms as a result of better viability and policy support.

It is worth mentioning that Kerala was also one of the first states to operationalise an online portal, Start-up India Kerala, to provide end-to-end Start-up registration, funding application and evaluation, minimise bureaucratic delays and improve transparency.

3.13.3 Mentoring and Capacity Building: Developing Entrepreneurial Talent

Structured and domain-specific mentoring is one of the pillars of sustainable Start-up development. The Start-up ecosystem in Kerala has developed a large pool of mentors who are based in academia, industry, government and the global diaspora. These mentors would provide advice on product-market fit, regulatory compliance, go-to-market strategy, team building and financial planning.

The Entrepreneurship Development Programmes (EDPs) and Bootcamps of KSUM are performed on a regular basis in cooperation with engineering colleges, business schools and research institutes in sectors. Also, the Kerala has experienced the rise of Start-up accelerators and sector-specific incubators including:

- BioNest Kerala of biotechnology projects,
- Hardware and IoT hardware maker village,
- Start-up Dreams to tribal entrepreneur,
- Graphene GIC in Thrissur, India.

Alongside formal programs, Kerala focuses on community-building as reflected by the regularity of Hackathons, Demo Days, Investor Meets and Founder Talk Series where entrepreneurs have a chance to pitch their ideas, receive feedback and make networks.

Capacity-building of mentors has also been given priority in the government with quality and consistency in the advisory services. Programs such as Mentor-Mentee Connect and Online Advisory Clinics assist early-stage founders to interact with sectoral experts, most of whom are Non-Resident Keralites (NRKs) with global entrepreneurial experience.

3.14 START-UP FUNDING ENVIRONMENT IN KERALA

Kerala has developed its ecosystem over the past 10 years and this is due to the high literacy levels, good education institutions and proper policy framework. Much emphasis is given by the state on inclusive entrepreneurship both in the cities like Kochi, Thiruvananthapuram, Kozhikode and so forth, and in smaller towns. The Kerala Start Up Mission (KSUM) was established in 2006 and has been crucial in determining how Start-ups are funded; as it provides seed funds, handholds and even makes connections of Start-ups with networks of investors. KSUM seed funding programmes tend to give 5-50 lakh rupees of finance to the early stage Start-ups to enable them to produce prototypes, test the business models and thus attract additional funding. It is also through the mission that access to venture capitalists and other state-based angel investors is gained thereby enhancing the visibility of Kerala based Start-ups in local and foreign markets. Angel investors would be an excellent necessity financing in Kerala. The capital of between 10 lakh and 1 crore is provided by the angel networks such as Kerala Angel Network and other individual high-net-worth investors and often mentoring and strategic contributions too. These premature investments are crucial in the process of polishing the models of business, expansion of pilot projects and inculcating credibility among the heavy investors. Over the past 5 years, the venture capital firms based in Bengaluru, Mumbai, and Delhi have been attracted to technology Start-ups, healthtechs, Agritech Start-ups and renewable energy companies in increasing numbers. Other Kerala based startups such as Waybeo, Genrobotics and Innoeye have been given VC funding of between 1 crore to over 20 crores giving them the opportunity to grow their businesses and contribute more to the product as well as venture into new markets.

3.14.1 Government Lead Financial Interventions

The incubators and accelerators of Kerala such as Maker Village, Techno park and Cyber park are ever present to assist them in terms of infrastructure as well as mentorship exposure to potential investors. Start-ups that emerge out of these programmes are more capital prepared with structured business planning, prototyping validation and pilot projects. Other than the traditional sources of funding, Kerala Start-ups have been considering the new source of funding through the use of crowdfunding, corporate funding, revenue-based financing and revenue-based grants that are present in the social impact programmes. CSR funds, government grants and international development funds lower the requirement of issuing equity as they offer the much needed initial stage finances to fund most Start-ups in the education, healthcare, agriculture and renewable energy sector. Kerala has a government centred funding environment. In the case of KSUM, the central schemes include Start-up India which offers co-investment opportunities, credit guarantees and tax incentives, top-up or supplement state-level schemes. Since the access to capital is additionally multi-focal as special funds target women entrepreneurs, technology-oriented businesses and the rural innovations. Combining the benefits of the government support, angel investment, venture capital, incubation program and other alternative financing programs Kerala has succeeded to partially create a robust, inclusive and favourable Start-up financing environment that promotes innovation, catalyzes regional Start-up activities and sees to it that the Start-ups attain scale without erupting.

Start-up funding environment in Kerala has seen a spectacular change in the last 10 years as it is marked by the growing access to institutional capital, the active involvement of governments and emergence of localised funding systems based on the socio-economic and innovation environment of the state. Although traditionally viewed as risk-averse in entrepreneurial investment, Kerala has slowly evolved into an entrepreneurial hotspot in Start-up financing in line with the national tendencies and tailoring them to the local opportunities and demands.

3.14.2 Angel Investment and Private Investment

In addition to the government support, the state has cultivated a web of angel investors and other venture capitalists of the state, including Non-Resident Keralites (NRKs)

who are eager to invest in the regional innovation. Increasing interest has been demonstrated in Kerala Start-ups by networking organisations like the Kerala Angel Network, Malabar Angel Fund and industry specific investors like Speciale Invest and Unicorn India Ventures. Investments by the angels are also enhanced by such events as Investor Cafes, Pitch Days and Demo Days organized by KSUM and academic incubators. These platforms help founders to meet investors, get feedback and raise equity or convertible debt. A report by KSUM indicates that in the 2020-2023 period, Start-ups in Kerala had more than 20 crores raised through private equity routes (KSUM, 2023).

3.14.3 Bank and NBFC Participation

The conventional financial institutions in Kerala have also started to include Start-up financing in their portfolio. Start-up loan schemes by public sector banks like State Bank of India and Federal bank and cooperative institutions like Kerala Bank have been initiated with low collateral conditions and lenient repayment plans. Certain NBFCs and microfinance organisations are also considering how to facilitate social impact and rural Start-ups and particularly women and youth led Start-ups. The developments demonstrate a paradigm shift in the financial ecosystem as banks are slowly beginning to accept risk and innovation as part of economic development as opposed to a liability.

3.14.4 Sectoral and Thematic Funding

The other peculiar nature of the funding environment in Kerala is the development of sector-based and thematic funding which is in line with the comparative advantages of the state. For example:

- HealthTech Start-ups have been targets of CSR-related investments by healthcare groups and NRK foundations.
- Under the central and state agricultural innovation missions, AgriTech and food processing enterprises are eligible to receive funds.

- Start-ups headed by women receive support with the help of the WE Mission Kerala and specific grants provided by KSUM.

This selective practice allows making a more calculated distribution of funds, which is in accordance with the developmental objectives and growth that is inclusive.

3.14.5. Crowdfunding and Alternative Models

The growing levels of digital literacy and use of social media in Kerala have led to alternative forms of funding including reward-based and donation-based crowdfunding. Start-ups have also been able to test market interest by using platforms such as Fueladream, Ketto, and Wishberry to earn an initial income. These approaches are particularly common in creative, artisanal, and social impact projects and are also increasingly seen as a forerunner to more standardised rounds of equity funding.

3.15 THE ROLE OF KSUM IN PROVIDING SEED FUNDS AND INNOVATION GRANTS

Kerala Start-up Mission (KSUM) is central in facilitating the Start -ups within the state through seed funds and innovation grants. KSUM provides financial assistance to early-stage Start-ups through its different funding schemes, thus helping them to develop and prove their ideas. The seed funds that are offered by KSUM assist the Start-ups to clear the initial financial challenges so that they can concentrate on the product development, research and team building in the market. Also, the culture of creativity and experimentation is promoted by the KSUM innovation grants that promote Start-ups to work on innovative projects and solutions. These are financial resources that KSUM enables the Start-ups to make risky decisions, innovate and develop thus impacting the general growth of the Start-up ecosystem in Kerala. This assistance is essential in assisting Start-ups to realise their potential in growth and make a significant contribution in their respective industries.

3.16 ANGEL INVESTORS AND VC PRESENCE IN KERALA

Another trend that has been observed in the Start-up ecosystem in Kerala is the increased number of angel investors and venture capital firms that are offering

invaluable funding support to Start-ups. Angel investors are high-net-worth individuals and invest in early-stage Start-ups in exchange of equity, not only with their money but also with expertise and mentorship. The venture capital firms conversely, invest in Start-ups that have high growth potential and inject more capital to enable them grow and expand. These investors have been in Kerala and have assisted in filling the funding gap in Start-ups so that they can access the funds they require in developing and growing their businesses. This has increased investment flow as well as confirming the potential of the Start-up ecosystem in Kerala, which leads to an increased number of investors and entrepreneurs coming to the state. Consequently, Start-ups in Kerala have increasingly access to funding alternatives which means that they can emphasize on innovation, growth and creation of jobs.

- Government schemes: Idea Grant, Seed Fund Scheme, Innovation Grant, etc.
- Examples of Start-ups that have been funded by Kerala government.

3.17 POSITIONING KERALA IN THE WIDER INDIAN CONTEXT

The Start-up ecosystem of Kerala holds a unique niche in the overall Indian situation with its own strengths, weaknesses and opportunities. Although Kerala is not considered to be one of the best Start-up hubs in India such as Bengaluru or Delhi-NCR, it has established its niche as a hub of innovation and entrepreneurship especially in such spheres as healthcare, education and tourism. The Start-up ecosystem of Kerala has a good foundation due to the high literacy rates, high human development indices, and a rising number of skilled talents in the state. Nevertheless, the state also has such issues as the lack of access to risk capital, talent leak and regulatory obstacles which must be eliminated to reveal all of its potential. The Start-up ecosystem in Kerala can be regarded as a miniature of the heterogeneous entrepreneurial environment of the country where knowledge sharing, collaborative and development opportunities can be offered. Using its advantages and overcoming its weaknesses, Kerala can become an influential participant of the Start-up ecosystem in India making this country grow and develop economically.

The Start-up ecosystem in Kerala is in a very unique niche in the bigger Indian picture with its own set of strengths, challenges and opportunities. Although Kerala is not one

of the leading Start-up centres in India as Bengaluru or Delhi-NCR, it has established its own niche as an innovation and entrepreneurship hub specifically in such areas as healthcare, education and tourism. The high literacy levels, good human development indices and an increasing stream of talented individuals ensure that Kerala has a good base of the Start-up ecosystem. Nonetheless, the state has also such issues as lack of access to risk capital, drainage of talents and regulatory barriers, which should be resolved in order to open the full potential of the state. In the Indian context, the Start-up ecosystem of Kerala can be viewed as a miniature of the diverse entrepreneurial environment in the country with the possibilities of sharing knowledge, cooperating and developing. With its strengths and handling its challenges, Kerala can become a major player in the Start-up ecosystem of India and it can be used to benefit the economic growth and development of India.

3.18 INDIAN START-UPS

Indian Start-up ecosystem has turned out to be dynamic and a lively force that has driven innovation, entrepreneurship and economic growth. The ecosystem, which is driven by a huge and expanding market, the presence of different talent pool and rising government assistance is characterised by the presence of a flourishing community of entrepreneurs, investors, incubators and accelerators. The big cities such as Bengaluru, Mumbai, Delhi-NCR and Hyder Abd are experiencing an outburst in the Start-up activity with different fields such as technology, e-commerce, healthcare and finance taking the center stage. Although issues such as lack of funding, complexity of regulations and accessing talents, the ecosystem is set to expand tremendously as a result of government effort, the rise in investment and the increase in the desire to innovate and take risks. This is because as the ecosystem matures, it is likely to take a more significant role in spearheading the economic growth and development of India and possibly become a successful example to other developing economies.

3.18.1 Start up India by Government of India

India celebrates nine years of Start-up India, a revolutionary journey started on January 16, 2015. This event is named National Start-up Day and it is commemorating the achievements the country has made in creating a strong and inclusive

entrepreneurial ecosystem. Start-up India which was launched as a flagship program of the Government of India was to foster innovation and trigger the development of Start-ups in the country. India has also solidly positioned itself as the third-largest Start-up ecosystem in the world with over 1.59 lakh Start-ups registered by the Department for Promotion of Industry and Internal Trade (DPIIT) as at January 15, 2025. This dynamic ecosystem that is powered by more than 100 unicorns is still making innovation and entrepreneurship redefine itself in the global arena. This transformation has been spearheaded by major hubs such as Bengaluru, Hyderabad, Mumbai and Delhi-NCR but smaller cities have also provided an additional push to the entrepreneurial spirit of the country. Fintech, edtech, health-tech and e-commerce Start-ups have addressed local issues and become global. The Zomato, Nykaa, and Ola companies demonstrate how India is evolving into not only job seekers but also job creators which is driving the economic growth.

INDIA'S TOP 10 MOST FUNDED STARTUPS IN H1 2024				
Rank	Start Up	Sector	Funding Type	Funding in US\$
1	zepto	Q-Commerce	Series F	\$665M
2	Flipkart	E-Commerce	Growth Equity VC	\$350M
3	meesho	Social Commerce	Late VC	\$275M
4	PharmEasy	HealthTech	Unknown Series Round	\$216M
5	BYJU'S	EdTech	Series F	\$200M
6	prpl	BeautyTech	Series F	\$120M
7	Pocket FM	Media	Series D	\$103M
8	shadowfax	Supply Chain Technology	Series E	\$100M
9	BharatPe	FinTech	Debt Financing	\$100M
10	Perfios	FinTech	Series D	\$80M

Source: Lucidity Insights Research & Analysis based on Crunchbase Data, Dealroom Data

Lucidity Insights

Source: Lucidity Insights

3.18.2 Key Milestones of Indian Start-ups

Start-up India initiative has been critical in creating an entrepreneurial ecosystem in the country over the last nine years. It has made significant achievements that demonstrate its contribution to the economy and society of India by ensuring innovation and inclusiveness.

- While the total number of DPIIT-recognised Start-ups has increased to 1,59,157 as of January 15, 2025 (compared to approximately 500 in 2016).
- By October 31, 2024, there are 73,151 recognised Start-ups with at least one woman director and this represents the growth of the women in India as entrepreneurs.
- Since the year 2016 to 31 October 2024, a total of 16.6 lakh direct jobs have been reported by recognised Start-ups and this is largely contributing to the creation of employment.

3.18.3 Core Features of the Start-up India Initiative

Start-ups have been relieved of heavy regulatory burdens by simplifying compliance processes, self-certification and single window clearance systems that have made it easier to do business. Moreover, Start-ups with eligibility are given three years of tax exemption which gives the Start-up a perceived relief in the initial delicate stages of operation. Access to early-stage capital is further enhanced by the availability of funding support in the form of 10,000 crore Fund of Funds of Start-ups (FFS). In addition to that, industry-specific policies in relation to other areas like biotechnology, agriculture and renewable energy lead to focused development and stimulated growth of industries that are strategically important.

3.18.4 Industry-wise Jobs Created by Start-ups

By October 31, 2024, more than 16.6 lakh direct jobs have been generated by DPIIT-recognised Start-ups in different sectors, which have contributed to the creation of employment to a large extent. The top rankings are 2.04 lakh jobs in the IT Services industry, 1.47 lakh jobs in the Healthcare and Lifesciences industry, and 94,000 jobs in Professional and Commercial services industry. These two contributions reflect the importance of Start-ups in economic growth and the generation of various employment opportunities in industries.

3.18.5 BHASKAR: Powering India Start-up Ecosystem

Besides the above activities, the Department of Promotion of Industry and Internal Trade (DPIIT) also introduced Bharat Start-up Knowledge Access Registry

(BHASKAR) platform in September 2024. This innovative project as a component of the Start-up India initiative, should help streamline the interactions within the Indian entrepreneurial ecosystem and centralise it. BHASKAR aims to help create innovation, collaboration and growth by linking the Start-ups, investors, mentors, service providers and government bodies which conforms to the vision of India being a world leader in entrepreneurship.

India is enjoying nine years of the Start-up India program and the nation has seen an incredible shift in the entrepreneurial environment. India has more than 1.59 lakh DPIIT-registered Start-ups and is also experiencing a rising workforce, as it has become a solid destination of innovation and entrepreneurship globally. The support initiative in the form of flagship schemes, capacity-building, tools like BHASKAR, and events such as the Start-up Mahakumbh has enabled the Start-ups in the sectors, regions and even non-metro cities. As India moves forward on its path to become a global innovator, the Start-up India initiative is one of the significant sources of economic development and an inclusive and dynamic environment of entrepreneurs.

3.18.6 Fund of Funds Scheme (FFS) for Start-ups

In 2016 with corpus of 10,000 crore, the Fund of Funds for Start-ups (FFS) Scheme was sanctioned and implemented, with half the contribution to occur in the 14th and 15th Finance Commission cycles as per the progress of the implementation to allow the Indian Start-up ecosystem a much-needed boost and access to domestic capital. Under FFS, the Scheme does not invest directly into Start-ups but rather capital is offered to SEBI-registered AIFs, the so-called daughter funds, who then invest funds into the development of Indian Start-ups by means of equity and equity-linked instruments. The mandate to operate this Fund has been vested in Small Industries Development Bank of India (SIDBI) by way of selecting appropriate daughter funds and managing the disbursement of committed capital. Under FFS, AIFs sponsored must invest at least 2 times of the amount invested under FFS in Start-ups.

Through the Start-up India initiative, the Government is also continually making a number of attempts to develop and expand the Start-up ecosystem in the country. Start-ups at different phases of their business cycle are being assisted by the flagship

Schemes namely, Fund of Funds for Start-ups (FFS), Start-up India Seed Fund Scheme (SISFS) and Credit Guarantee Scheme for Start-ups (CGSS) to ensure that Start-ups graduate to a point where they can be able to raise investments through angel investors or venture capitalists or take loans through commercial banks or financial institutions. Another initiative that is important to the holistic development of the Start-up ecosystem is the Government which holds flagship annual exercises and programs such as States' Start-up Ranking, National Start-up Awards and Innovation Week. The Government consults the stakeholders to make regulatory and policy-related suggestions to improve the ease of doing business and minimize compliance burden on the Start-up ecosystem. The Government also enables participation and engagement of the Indian Start-up ecosystem at the international platforms.

3.18.7 Credit Guarantee Scheme for Start-ups

The Credit Guarantee Scheme for Start-ups was established by the Government of India with a fixed corpus to provide credit guarantee on the loans given by Scheduled Commercial Banks, Non-Banking Financial Companies (NBFCs) and Venture Debt Funds (VDFs) to DPIIT- recognised Start-ups under SEBI-registered Alternative Investment Funds. The new framework has improved the coverage of guarantee, the maximum limit has been raised to 20 crore per eligible borrower as opposed to 10 crore. The CGSS does not offer guarantee cover directly to DPIIT-recognised Start-ups, but via a Trustee (NCGTC) which offers guarantee cover to MIs lending to Start-ups. The assistance instruments would be in the form of Venture debt, working capital, subordinated debt/mezzanine debt, debentures, optional convertible debt and other fund-based and non-fund-based facilities, which have crystallised as debt obligations. This model would be transaction-based or umbrella-based credit guarantee coverage.

3.18.8 Start-up India Seed Fund Scheme (SISFS)

Start-up India Seed Fund Scheme (SISFS) is an outlay of INR 945 Crore of financial support to Start-ups by the Department for Promotion of Industry and Internal Trade (DPIIT) as proof of concept, prototype development, product trials, market entry and commercialisation. It will be serving 300 incubators with an estimated 3,600 entrepreneurs within the next 4 years. The Seed Fund will be paid to eligible Start-ups

via eligible incubators in India. Start-up India Seed Fund Scheme (SISFS) seeks to give financial support to Start-ups in the form of proof of concept, prototype development, product trials and market entry commercialisation. This would allow these Start-ups to mature to a stage where they can attract investments either by the angel investors or venture capitalists or borrow money by commercial banks or other financial institutions.

3.18.9 Start-up India Investor Connect

Start India Investor connect program is a transformative platform which acts as the mediator between Start-ups and investors to provide them with a chance to grow and get funded. This initiative helps entrepreneurs to present their ideas, raise capital and expand their businesses by matchmaking Start-ups to potential investors. Start India Investor Connect provides Start-ups with the necessary resources to achieve success by means of networking opportunities, pitching and mentorship. This initiative will promote innovation, entrepreneurship and economic growth by supporting funding and expertise, which will help develop a dynamic Start-up ecosystem in India. Finally, Start India Investor Connect can be very useful in aiding the entrepreneurial ambitions of the country and fostering the culture of innovation and risk-taking.

3.19 FAST-EVOLVING START-UP ECOSYSTEM IN KERALA

Start-up ecosystem in Kerala is creating ripples in the global arena in a spectacular growth and innovation process. The Start-up ecosystem of Kerala according to the 2024 Global Start-up Ecosystem Report (GSER) has an amazing valuation of \$1.7 billion within the last 18 months before the end of 2023. This growth rate is five times higher than the worldwide average, which points at Kerala booming to the status of a great force in the entrepreneurial innovation arena. Whereas on a global average, the Start-up ecosystem has been developing at an average of 46 percent per year since July 1, 2021, to December 31, 2023, the ecosystem in Kerala has recorded a whopping 254 percent compound annual growth. This remarkable number highlights the active nature of the state and the provisions that are taken in order to create a strong Start-up atmosphere.

Ecosystem Value is one of the measurement metrics of the economic impact that counts the value of exits and Start-up valuations and Kerala ranks as one of the best achievers. Its success story not only focus on growth but also different rankings and categories that have been rated by the Global Startup Ecosystem Report(GSER). The Asian ranking of ecosystems has ranked Kerala as the fourth by considering the requirement of affordable talent, which is a measure of the capacity to employ technology talent at low costs. The ranking is vital because it shows the ability of the state to bring and retain talented professionals which is an important factor in economic development in the technology industry. In addition, Kerala has been ranked as the top 30 Asia-wide ecosystem on its performance which is an indicator of the overall performance and well-being of the Start-up environment. The strategic approach of the state in relation to developing talent and cultivating innovation has yielded, making it one of the leaders in the region. Kerala is also classified by the GSER in the Bang for Buck list of the top 20 Asian ecosystems. This type will gauge the level of runway tech Start-ups can obtain during a venture capital round that would allow efficient utilisation of resources and the prospect of future expansion.

Also, Kerala belongs to the 35 highest-ranked ecosystems with regard to Knowledge which evaluates innovation with regard to research and patent activity and Funding which assesses early stage funding and investor activity. These rankings show that Kerala is determined to promote innovation culture and help Start-ups to go through different stages of development. The data analysed in the GSER-2024 was of more than 4.5 million companies and over 300 entrepreneurial innovation ecosystems around the globe. It gives significant information on the international Start-up trends and gives detailed rankings of the top global ecosystems, new ecosystems and regional leaders. The fact that Kerala ranks highly in these rankings is a success story of its strategic plans and support given to the Start-ups. According to the report, Kerala dominates the ecosystems in India and only a few other states such as Telangana, Tamil Nadu and Karnataka have found their way to the list.

As of 2023, Start-ups in Kerala have raised 33.2 million 227 crore) compared with 15% more than the year before. Also in software exports, the state has recorded an

export of approximately 2.3 million dollars in 2022-23 and the state has set a target of a 10 per cent share of the nation in its IT exports with the creation of five lakh new employment opportunities. KSUM has been very active in supporting Start-ups by various means, which has given the state a good environment to innovate and grow. Kerala has also innovated and identified important innovations as reported by GSER-2024 like the launch of the Kairali AI Chip, the first AI processor in the state produced by Kerala Digital University. Furthermore, a school in Thiruvananthapuram also introduced the first generative AI teacher (Iris) in India that can teach several subjects in English, Hindi, and Malayalam. KSUM has been playing the lead in nurturing the Start-up ecosystem in the state. KSUM has an array of services such as funding, incubation facilities and networking services among others. The mission has played a crucial role in shaping the development of Start-ups and formulating innovation culture in Kerala. State technology parks, like Technopark in Thiruvananthapuram, Infopark in Kochi and Cyberpark in Kozhikode are very instrumental in offering global-class infrastructure and resources to Start-ups. The parks provide a dynamic environment that promotes the growth and development of tech Start-ups, and thus Kerala will be a preferred location by both the entrepreneur and investor.

3.20 CONCLUSION

The theoretical framework in this chapter has provided strong platform to study and analyse the dynamics of funds strategy in Start-up ecosystem in Kerala. Combining the existing theories which include the Pecking Order Theory, Resource-Based View, Financial Growth Cycle Theory and Innovation Diffusion Theory, this framework provides the multidimensional perspective through which the Start-up funding behaviour and preferences might be analysed critically. The theoretical insight into Start-ups and the funding lifecycle also depicts the subtle and changing character of the financial requirements under different levels of development such as ideation and expansion. It highlights the relevance of the context-specific funding approach which is in line with the internal potential of Start-ups and external opportunities in the ecosystem.

The Start-up ecosystem in Kerala with its pronounced government intervention is a unique case due to the existence of supportive organisations such as the Kerala Start-up Mission (KSUM) and the culture of innovation that is steadily growing. The chapter has highlighted the advantages like access to seed funds, structured grant schemes as well as state-backed incubators and the weaknesses such as low occurrence of private venture capital and risk averse culture of investing. When the chapter is broadened to the Indian Start-up environment the state of Kerala is placed in the context of national policies and schemes and funding organizations. Although Kerala enjoys the advantages of both central programs including the Start-up India and the Fund of Funds of Start-ups, the differences between the flows of the private equity and the number of investors in relation to the top states, Karnataka or Maharashtra are also certain. These variations bring out the importance of adopting localised approaches which capitalise on the institutional advantage that Kerala presents and at the same time limits its structural weaknesses. The implications that are made out of this framework will be crucial in the comprehension of how funding strategies can be streamlined toward the incubation of Start-up growth, sustainability and innovation in Kerala and other comparable emerging ecosystems.

Chapter 4

ANALYSIS AND INTERPRETATIONS

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4.1 INTRODUCTION

This chapter deals with the analysis and interpretation of data collected to examine the funding strategies of Start-ups in Kerala. It aims to provide a comprehensive understanding of how financial decisions, institutional support and entrepreneurial experiences collectively shape the performance of Start-ups within the state's dynamic ecosystem. For analytical clarity and alignment with the research objectives, the chapter is structured into four major parts, each corresponding to a specific dimension of the study.

PART I: Initiatives of the Government of Kerala in providing financial and other facilities for promoting Start-ups

PART II: Choice of selecting funding strategies in Start-ups

PART III: Level of satisfaction of entrepreneurs towards Start-up Finance

PART IV: Analyse the multifaceted risks of availing Start-up funding in Kerala

4.2 PART I: INITIATIVES OF THE GOVERNMENT OF KERALA IN PROVIDING FINANCIAL AND OTHER FACILITIES FOR PROMOTING START-UPS

4.2.1 Methodology used for the analysis of Government Initiatives and Institutional Support

For the analysis of the Initiatives of the Government of Kerala in providing financial and institutional support for Start-ups, a qualitative approach was used. The data required for this analysis were collected from secondary sources such as government reports, official websites, policy documents, publications of the Kerala Start-up

Mission (KSUM) and allied agencies. The analysis was constrained by the limited availability and accessibility of updated data from certain government departments and agencies. Despite these limitations, the qualitative approach proved significant in identifying the key patterns, strength and gaps in the government's support ecosystem. This analysis forms a crucial foundation for contextualising the subsequent quantitative assessment of funding strategies, entrepreneur satisfaction and for the analysis of multifaceted risks and challenges associated with Start-up funding in Kerala.

The relevance of using a qualitative approach lies in its ability to capture the depth, diversity and inter-linkages of institutional mechanisms supporting Start-up factors that cannot be meaningfully represented through statistical measures. It enabled the researcher to critically examine the strengths, limitations and gaps in the Start-up support ecosystem. Identification of the emerging policy trends in Start-up ecosystem and understanding the real-world implications of government interventions are the other advantages of qualitative analysis.

Although, limited accessibility to updated data from some departments and agencies was a constraint, it provided valuable insights into the evolving landscape of Start-up finance and institutional support in Kerala. Moreover, this qualitative analysis serves as a thematic foundation for contextualising the quantitative assessments of funding strategies, entrepreneurial satisfaction and financial risks presented in subsequent sections of the study.

4.3 OVERVIEW

The evolution of Kerala's Start-up policies (2014, 2018 and 2021) and the consequent establishment of the Kerala Start-up Mission (KSUM), including its partnerships with national and international incubators and integration with the Department for Promotion of Industry and Internal Trade (DPIIT) are the major Start-up India initiatives in Kerala. The institutional contributions of the Kerala State Planning Board, K-DISC and higher education linkages are also highlighted. The major financial support schemes for Start-ups include seed funding, prototype grants, scale-up financing, matching grants, tax incentives, student-focused packages and women

entrepreneurship schemes. Incubation and infrastructure support through state-supported incubators, Fab Labs, Maker Villages, Innovation and Entrepreneurship Development Centres (IEDCs), co-working spaces and international accelerator programmes also forms part of the major initiatives of the Government of Kerala. Access to credit and institutional finance, including loans, bank-linked credit facilities, credit guarantees and venture funding are the other initiatives in providing financial and other facilities for Start-ups. Skill development and mentorship initiatives, including entrepreneurship programmes, hackathons, networking platforms and higher education-linked mentorships, are also included.

The set of policies, regulations, programmes and institutional mechanisms are designed by the government of Kerala to support Start-up creation, growth and sustainability. It includes Start-up policies, funding schemes, incubation and accelerator programmes, mentorship initiatives and regulatory simplification to reduce barriers and foster innovation. Dedicated institutions, such as Start-up missions, innovation hubs and nodal agencies, implement these policies and play a pivotal role in implementing these policies and provide financial and non-financial support and facilitate linkages between academia, industry and investors. A strong framework ensures that Start-ups have access to capital, infrastructure, markets and legal protections, promoting employment, technological advancement and economic development. In this context, an evaluation of the various initiatives of the Government of Kerala in providing financial and other facilities for promoting Start-ups in Kerala was attempted under the following 11 major heads.

- 1. Evolution of Kerala's Start-up Policies**
- 2. Timeline of Policy Evolution and Ecosystem Development**
- 3. Establishment and role of Kerala Start-up Mission**
- 4. Kerala's Dynamic Start-up ecosystem: National and International Partnerships driving Innovation and Growth**
- 5. Kerala's integration with DPIIT and Start-up initiatives**

6. Financial Support Schemes

7. Incubation and Infrastructure Support

8. Access to Credit and Institutional Finance

9. Skill development and Mentorship Initiatives

10. Start-up Performance Outcomes

11. Kerala's Contribution to India's Start-up Ecosystem and Future Roadmap

4.4 EVOLUTION OF KERALA'S START-UP POLICIES

The development of Kerala as a Start-up hub is an outcome of a well-thought-out evolution in the government policies, financial support mechanisms and infrastructure establishment. This path was indicative of how the state has capitalised on its robust education, inclusive regional policies and sizeable investments to promote entrepreneurship and innovation in every sector. The Start-up momentum in Kerala commenced in 2014 with the introduction of its Technology Start-up Policy and became the first state in India to have formulated such a progressive policy. To achieve its vision of being the best Start-up destination in the country and in the top five of the world, the government had set the strategic pillars, which include infrastructure, funding, incubation, human capital and sectoral diversity. The adventurous call was enhanced through the establishment of Kerala Start-up Mission (KSUM) that quickly became the anchor point in all the activities that are incubated by the state.

4.5 TIMELINE OF POLICY EVOLUTION AND ECOSYSTEM DEVELOPMENT

The Timeline of Policy Evolution and Ecosystem Development for Start-ups refers to the chronological mapping of government initiatives, regulatory frameworks and institutional support mechanisms that have shaped the Start-up environment over time. It highlights the key policy milestones, amendments and strategic programmes

aimed at fostering innovation, entrepreneurship and ease of doing business. This timeline also reflects the growth of supporting infrastructure, incubation centers, funding mechanisms and skill development initiatives, providing a clear overview of how the Start-up ecosystem has matured, adapted and responded to emerging opportunities and challenges in a dynamic economic landscape.

4.5.1- 2014: The Policy Launch

The history of Kerala in terms of policy evolution and the development of the entrepreneurial ecosystem can be traced back to 2014, when the Technology Start-up Policy was launched, which gave birth to an entrepreneurial ecosystem in the state and saw 550 Start-ups being registered during its first year. In this timeframe, Kerala has created the largest network of student innovation with over 100 Innovation and Entrepreneurship Development Centres (IEDCs) across the colleges to enable young entrepreneurs with access to funding and product development. Initiatives on early incubation were made to focus on Kochi, Trivandrum and Kozhikode where the entrepreneurship are underpinned with the support of public-private partnerships and grants of up to 25 Rank lakhs and 5 Rank lakhs per Start-up to create a sector-agnostic and innovation-based enterprise with greater entrepreneurship and freer enterprise Start-ups at the initial stage.

4.5.2- 2015–2017: Expansion and Local Talent Focus

In 2015, institutional funding on Start-ups increased to approximately 19.6 million that aided close to 757 technology Start-ups. The Company increased its activities, developing a talent pipeline of entrepreneurs via FabLabs and boot camps. By 2017, the number of active Start-ups exceeded 1400, with over half of them operating in the sphere of software and IT, with the other half spread across manufacturing, healthcare etc. The introduction of the complete online implementation system allowed a seamless registration and tracking of grants, support and mentorship.

4.5.3 - 2018: Massive Ecosystem Growth

Kerala had one of the highest numbers of Start-ups and 30 incubators in the entire India. A total of 59 Start-ups were funded by the state between 2017 and 2018, with 38 million dollars being invested in the sector in the form of 59 Start-ups. Over 214 colleges took part in Start-up boot camps and the Fund of Funds model used accelerated new ventures into self-sustaining ventures. Availing of patents was also encouraged through special policies, up to 2 lakh was reimbursed for national patents and 10 lakh international patents were reimbursed.

4.5.4- 2019–2021: Mature Ecosystem and Global Recognition

An Integrated Start-up Complex was opened in Kochi, comprising an area of 1.8 lakh square feet dedicated to Start-ups. The amount of yearly disbursement by KSUM has surpassed 250 crores and the rate of investment per Start-up is increasing. The Start-up mission of Kerala has been ranked as the best in the world as the No.1 public business incubator in the 2021 classification, accentuating its global reputation. The total registered Start-ups has increased to more than 3800 and the state made sure that inclusivity is not overlooked by providing grants to women and transgender entrepreneurs, which take up to 5 lakh rupees per project. By this point, Kochi and Trivandrum have become the most established regional Start-up clusters in India and almost 40 percent of Start-ups in the country have their base in Kochi.

4.5.5- 2022–2025: Advanced Sector Support and Future Vision

KSUM has been growing steadily, and by 2025, the network will have been responsible in the creation of more than 65000 new jobs through various Start-ups. The ecosystem has now had the addition of advanced innovation zones that are concentrated on areas such as artificial intelligence, electric vehicles, defense technology and healthcare. Kerala has been on track to reach its target of producing 15000 Start-ups and 100,000 employment by 2026, investing more than 1000 crores in the next-generation industries and inaugurating Global Capability Centers in Kochi.

Table 4.1*Year-Wise Evolution of Start-up*

Year	Milestone / Update	Start-ups	Funding & Support	Key Locations	Signature Initiatives
2014	Start-up Policy Launch	550+	Seed funds, grants	Kochi, Trivandrum, Kozhikode	KSUM, FabLabs, IEDCs
2015	Expansion, PPP Incubators	757	\$19.6M institutional	Kochi, Trivandrum	Bootcamps, local college labs
2017	Major Ecosystem Growth	1,400 +	\$38M funding	Kochi, Kozhikode	Accelerators, patent support
2018	Super FabLab, Fund of Funds	1,500 +	₹2-10 lakh grants	Kochi, Calicut	Patent/R&D incentives, innovation in colleges
2019-21	Integrated Start-up Complex, global recognition	3,800 +	₹250+ crore per year	Kochi, Trivandrum	Women/trans grants, sector innovation hubs
2022-25	GCC expansion, AI/EV sector focus	6,400 +	₹1,000+ crore	Kochi, Thiruvananthapuram	Advanced tech parks, 65,000 jobs, 100K students/year

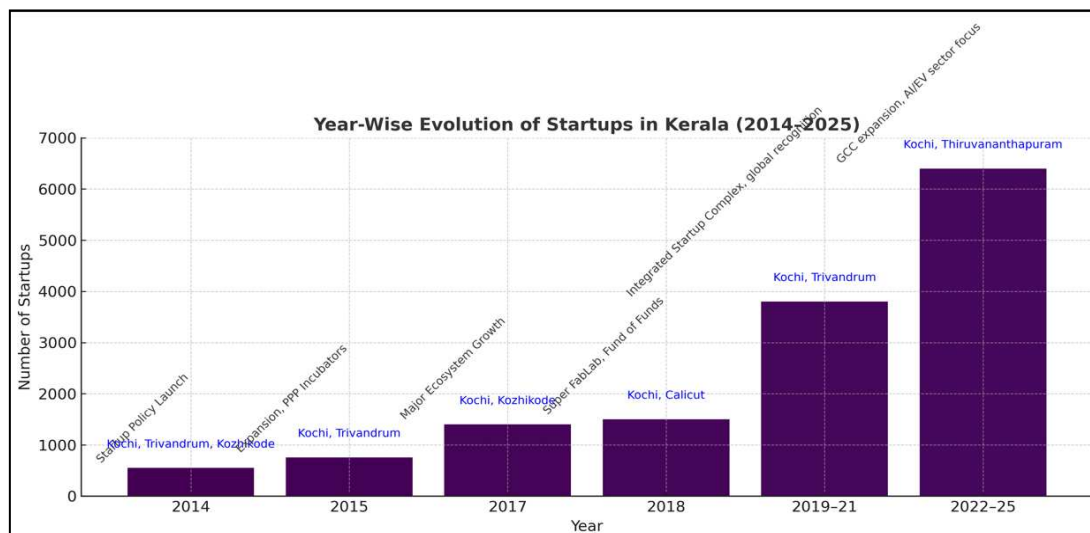
Source: *Kerala Start-up Ecosystem Report, 2014 2016, 2016, 2018, 2025*

The Start-up policies of Kerala have always placed emphasis on inclusiveness, where resources are made available to rural and semi-urban regions, ensuring that innovation is not limited by location to metropolitan areas. The state currently has more than 10,000 co-working stations, prototyping laboratories numbering 22, and excellent provision of intellectual property to new enterprises. Alliances with multinational technology firms provide cost-sponsored cloud and digital resources to Start-ups and regular boot camps recruit a steady flow of new concepts through colleges and maker spaces. With the advent of Kerala State Innovation Council and the visibility integration between schools, colleges, incubators and government institutions, Kerala has made its system nimble-footed, self-rejuvenating and readily perceivable to

technological breakthroughs that could immediately find educational, commercial and social vaporisation. Investments in phases, policy shifts to the futuristic and infrastructure building that is regionally-inclusive, Kerala has been able to build an environment that enables it to support grassroots innovators, scale disruptive ideas to commercial viability and consistently set a global benchmark in what a state can do to support Start-ups in India. Having acquired a reputation the world over and having retained a local touch, the state is leading the field in fostering talent and encouraging high-impact entrepreneurs of all ages.

Figure 4.1

Year-wise Evolution of Start-ups in Kerala (2104-2025)



4.6 ESTABLISHMENT AND ROLE OF KERALA START-UP MISSION (KSUM)

The Kerala Start-up Mission (KSUM) is the agency in Kerala focused on creating a vibrant entrepreneurial ecosystem to nurture technology-enabled Start-ups through their entrepreneurial life cycle. Its process started in April 2006 when Techno Park Technology Business Incubator, the state Incubator, was first organised to later become a part of KSUM itself. The Kerala Technology Start-up Policy, which was initiated in 2014, made Kerala the first state in India to have such a comprehensive policy, so the Start-up activity in Kerala and the inflow of investments has grown exponentially. KSUM is the state-designated nodal agency that plans, sets up and

manages incubation infrastructure, as well as creates an effective support system of co-working spaces, additional incubators and technology-based hubs across important locations, such as Trivandrum, Kochi and Calicut and intrastate, Kasargod. Being an arbiter of innovation-driven entrepreneurship, KSUM has the responsibility of ensuring that it gives a launching pad to budding entrepreneurs.

The agency oversees large incubators and mini incubation units and over 226 Innovation and Entrepreneurship Development Centers (IEDCs) in technical colleges, with each year over 10000 Start-up entrepreneurs being incubated. Its support mechanisms are seed funding, Innovation Grants, Patent Reimbursement schemes and global networking programmes like Huddle Kerala, Seeding Kerala, UK Acceleration Catalyst and key events such as Kerala Innovation Festival. These not only contribute to the creation of high-impact products and solutions but also presence in national and international forums, with Kerala Start-ups winning major awards in areas like artificial intelligence, Healthtech, Agritech, tourism and space technology. Grassroots innovators, as well as those already in businesses, are benefited as over 6,400 Start-ups have been registered throughout 2025 and have created over 65,000 jobs and raised over \$665 million in funds with the help of policies such as that of the Chief Minister and streamlined business licensing via K-SWIFT. The agency borrowed inspiration to develop a bottom-up talent strategy, comprising an interlinked network of schools, colleges, incubators and government institutions. With industry-academia connects and an invitation to hackathons, strong industry-academia connectivity and pursuant of intentions on translation of research work to commercial activities ensure success through KSUM. The pipeline has been established and youth entrepreneurship has been entrenched through unwavering handholding and mentorship and preferential treatment of their innovative solutions in terms of government access to the markets. Kerala also uses its already well-established literacy levels and skilled human resources to boost the women entrepreneurs and rural innovators entering the world of technology. International relationships, like cooperation with Bosch DNA and London & Partners, provide market access and technology exchange to Kerala-based businesses, which form another foundation of the reputation of the ecosystem.

The ripple effect of KSUM can be seen by the way Kerala has reported a 20% growth in its Start-up ecosystem in an annual basis, a 147% increase in value of its ecosystem in 2025 and Kerala is positioned to have a GSDP of 150 billion dollars by 2024-25 at 11.7-annual growth rate. The significant policy changes between these have been an investment of INR 2500 crore on Start-ups and INR 2000 crore to facilitate venture capital, innovative labs and fabrication labs throughout the state. The agency prioritizes the latest technologies such as AI, Blockchain, Machine Learning, Robotics and others and optimises the regulatory procedures to promote doing business in a comfortable environment. The PPP mode of operation which operates incubation centers such as Start-up Village is now the model that is to be copied across India and KSUM has won several India-level awards such as the Globe World No. 1 Public Business Accelerator award by UBI Global and the DPIIT Top Performer Ins at the state Start-up ranking. Such multifaceted and cross-functional experience with robust government support, academic collaborations and international networking has made KSUM as a locomotive of innovation economy in Kerala and this has continuously created employment, investment and scaled solutions to social issues. Kerala features thousands of success stories, transformational products and sustainable business models which make the ecosystem a model of inclusive and future-ready entrepreneurship in India.

Table 4.2

Kerala Start-up Mission (KSUM): Establishment, Milestones and Impact

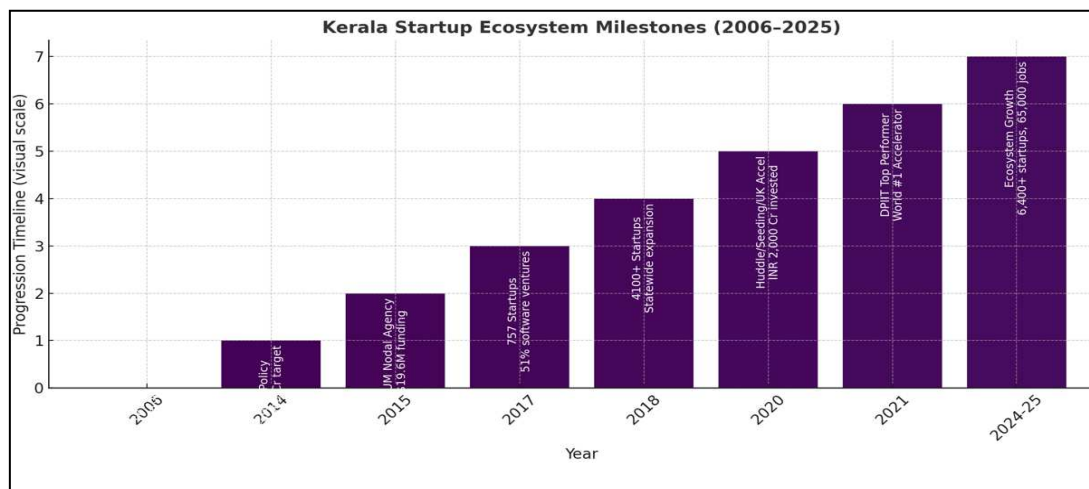
Year	Milestone/Initiative	Data/Impact	Locations/Reach
2006	Establishment as Technopark TBI	First state incubator established	Trivandrum
2014	Kerala Technology Start-up Policy	First state to introduce Start-up policy; INR 2,500 crore target	Statewide
2015	KSUM as nodal government agency	Institutional funding rose to \$19.6 million	All districts
2017	757 tech Start-ups, 51% software-focused	Focus on scalable, problem-solving ventures	Kerala

Year	Milestone/Initiative	Data/Impact	Locations/Reach
2018	Spread of 10 lakh+ sq. ft. incubation space, seed grant, patent support	4100+ Start-ups registered	Statewide
2020	Huddle Kerala, Seeding Kerala, UK Acceleration	INR 2,000 crore invested, global partnerships	Kochi, Trivandrum, Calicut
2021	DPIIT “Top Performer” status	World #1 Public Business Accelerator by UBI Global	Kerala & international
2024-25	6,400+ Start-ups, 65,000 jobs, \$665M funding, GSDP \$150B	147% ecosystem value surge; streamlined K-SWIFT licensing	Kerala and global

Source: Kerala Start-up Mission. (2024). Annual Report 2023-2024

Figure 4.2

Kerala Start-up Ecosystem Milestones



4.7 KERALA'S DYNAMIC START-UP ECOSYSTEM: NATIONAL AND INTERNATIONAL PARTNERSHIPS DRIVING INNOVATION AND GROWTH

With powerful government programmes, strategic alliances and international partnerships, Kerala became one of the most inclusive and rapidly expanding Start-up eco systems in India, Kerala Start-up Mission (KSUM), an agency set up by the State Government to organise and promote entrepreneurship in the State, has played a lead

role in energising the Start-up ecosystem in Kerala. KSUM achieved this by collaborating with national and international incubators and accelerators to support Start-ups through their infrastructure, mentoring, funding and market access. The government started to support this in 2014, with the Kerala Technology Start-up Policy, creating over 530 Innovation and Entrepreneurship Development Centres (IEDCs) at colleges and universities, framing the scene of innovation. This instilled the entrepreneurship spirit across the state and became the largest network of student innovations in India. Unlike most of the ecosystems that centered their activities on the urban hub, the state of Kerala promoted innovation in both rural and semi-urban locations, resulting in a mix and grassroots Start-up culture.

At the national level, the government of Kerala has been working in partnership and cooperation with organisations like the Department of Science and Technology (DST), Biotechnology Industry Research and Assistance Council (BIRAC) and Indian Council of Agricultural Research (ICAR). Through these partnerships, several officially approved incubators were approved and funded by the government.

State has also been working with larger Indian incubators like Nasscom Start-up Warehouse in Ernakulum and Zone Start-ups India. These were the establishments that introduced specialist accelerator initiatives in Kerala in 2020 which ultimately enabled Start-ups in Kerala to grow nationally. The state has also invested in the operations of its own incubators, including Maker Village (Start-ups in the hardware domain in Ernakulum), Mobile 10X (focus on mobile technology in Calicut) and Krobs Bionest (with biotechnology focus in Ernakulum). These incubators have played a significant role not only in emerging innovative Start-ups but also in creating sector-specific (deep expertise) within the Kerala Start-up ecosystem. International cooperation is one of the features of the strategy of Kerala to globalise its Start-ups. Such collaborations with MIT, where Kochi hosted the Super FabLab of MIT, the first and largest outside the US in 2019, state partner of the Centre for Bits and Atoms. This lab provides state-of-the-art digital production functions that enable Start-ups to test and explore advanced technologies and technology locally, connecting to global networks.

Kerala has also been developing talent exchange, including technological collaboration with the Middle East and the Gulf Cooperation Council (GCC) regions through programmes like the Middle East and India Tech Dialogue as part of the Kerala Technology Expo activities. The international venture funds invested and the market access scheme are supplemented by Kerala in encouraging Start-ups in international innovation events. Start-ups regularly attend conferences such as Start-up India, the Global Start-up Ecosystem Report platforms and global accelerators, which are promoted by government schemes that subsidise the travel and networking efforts. The field of Start-ups in Kerala is highly diversified, including major areas like artificial intelligence, machine learning, Blockchain, health tech, Agritech, renewable energy and tourism tech by combining the traditional advantages of the state on the one hand and new technologies on the other. To take some examples, Start-ups related to health technology and sustainable tourism are applications of Kerala innovation that align with their cultural backgrounds and the needs of the economy. The scaled-up incubation infrastructure by the government is remarkable, having more than one million square feet of incubation and coworking spaces in the state by 2025. Major such hubs are located in Kochi, Thiruvananthapuram, Calicut, Kannur and Kozhikode. These hubs integrate physical infrastructure with mentoring networks, seed funding through programmes such as Nidhi Prayaas and accelerator support, both national and international.

The venture capital sector in Kerala is developing at a healthy pace, where the Government-backed venture funds have invested more than INR 59 crore (\$7.3 million) in at least four SEBI-registered venture funds since 2020. Crowdfunding platforms and angel investor networks are also found to be a significant part of Start-up funding. Recent reports show that the valuation of Start-up in Kerala, jumped by 147 percent in 2025. There are more than 6500 registered Start-ups in Kerala that received an estimated equivalent of more than 665 million in investment, which created more than 65,000 jobs in Kerala. In 2024 the government presented a forward looking industrial policy that supports 22 priority industries including emerging technologies such as AI, big data, Blockchain, robotics and logistics. Licensing industrial parks has been simplified under the programmes like K- SWIFT with 52 new parks taking shape in 2024 alone to enhance industrial infrastructure.

Multinational enterprises have increased markedly through global capability centres (GCCs) located in Kochi and Thiruvananthapuram and a GCC policy is in the works seeking to transform Kerala into a global enterprise hub. The MSMEs of the state play an active role in Indian space missions such as Chandrayaan and Mangalyaan and are therefore indicators of their advancement in the technological field.

A multi-faceted intervention that involves policy support, infrastructure creation, national and international relationships and wide participation of rural and urban innovators can be best cited as the reasons for not achieving success overnight in the state of Kerala regarding Start-ups. This has given rise to such entrepreneurship that is based on a culture of inclusive growth, technological dominance and sustainable innovation. This integrated national-international-local partnership network, aligned with cutting-edge policy support and ecosystem building, continues to propel Kerala as one of the world's most inclusive, innovative and rapidly growing Start-up ecosystems, setting a benchmark for others to follow.

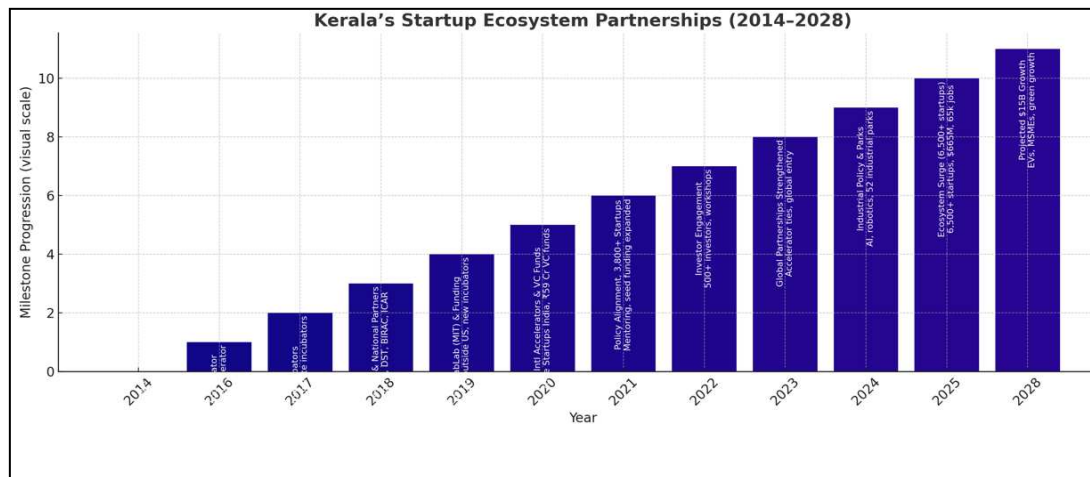
Table 4.3

Kerala's Start-up Ecosystem Partnerships (2014–2025)

Year	Initiative / Partnership	Description & Impact	Locations / Partners
2014	Kerala Technology Start-up Policy & IEDCs	Over 530 Innovation & Entrepreneurship Development Centres; the largest student innovation network in India	Statewide colleges and rural institutions
2016	Global recognition of KSUM; EY accelerator	Ranked among top 5 global public-private incubators; launch of 1,500 sq. ft. EY accelerator	Thiruvananthapuram
2017	Support to private & national incubators	Operational & capital grants to government and DST-approved incubators, private co-working spaces	Kochi, Ernakulam, Thiruvananthapuram, Kozhikode
2018	Expansion of incubation infrastructure & national partnerships	Addition of 500,000 sq. ft.; collaboration with DST, BIRAC, ICAR; funds and mentoring support	Major hubs

Year	Initiative / Partnership	Description & Impact	Locations / Partners
2019	Launch of Super FabLab (MIT partnership); funding to incubators	First large-scale digital fabrication lab outside USA; funded Maker Village, Mobile 10X, Krobs Bionest incubators	Kochi, Ernakulam, Calicut
2020	Launch of international accelerators; venture capital funds	Zone Start-ups India virtual accelerator launched; INR 59 crore venture funding	Kerala & India
2021	Policy alignment with Start-up India; 3,800+ Start-ups registered	Mentoring and seed funding expansion under national campaigns	Statewide
2022	Investor engagement & Start-up workshops	Over 500 investors engaged through workshops and masterclasses	Statewide
2023	Strengthened global partnerships and incubation scale	Enhanced accelerator ties; supported global market entry	Kerala & international
2024	Industrial policy launch; approval of private industrial parks	Support for AI, blockchain, robotics in 22 sectors; 52 new industrial parks approved	Kochi, Thiruvananthapuram, various
2025	Ecosystem surge: 6,500+ Start-ups; \$665M funding; 65,000 jobs	147% increase in ecosystem value; diverse sectoral growth	Statewide
2028	Projected industrial sector growth over \$15B	MSME contribution to national space missions; EV manufacturing and green initiatives	Statewide

Source: Start-up Genome. (2024). *Global Start-up Ecosystem Report 2024: Kerala's ecosystem by the numbers*

Figure 4.3*Kerala's Start-up Ecosystem Partnerships (2014-2028)*

4.8 KERALA'S INTEGRATION WITH DPIIT AND START-UP INDIA INITIATIVES

The Kerala government has been at the forefront of creating a dynamic Start-up ecosystem to integrate the state initiative with the national policy led by the Department of Promotion of Industry and Internal Trade (DPIIT) as Start-up India. Having introduced its Kerala Technology Start-up Policy in 2014, the state has strongly associated itself with DPIIT to be able to reap the rewards of recognition, funding, infrastructure and regulatory advantages to help its Start-ups scale to the national as well as global levels. The vision of Kerala destination Start-up policy is to achieve a position of the top Start-up destination by supporting Start-ups and providing strategic financial support, infrastructural and policy support. Integration with DPIIT under Start-up India makes this framework stronger as Kerala Start-ups will be able to access national-level incentives of tax breaks, government-backed funding programmes, inclusion of tenders, as well as greater access to the investor pool. DPIIT recognition provides a Start-up with an official stamp that helps them to reach credibility and the advantages that benefit them provided by the central and state governments. An important step in the Start-up journey in Kerala was its innovative model of allocating one percent of the state's annual budget towards entrepreneurship development and it was the first example in India. The state government formalised

Kerala Start-up Mission (KSUM) as the main agency to promote incubation, mentoring and commercialisation. The role of KSUM in the support of Start-ups is to act as a support arm to the policies of the state and DPIIT schemes, thereby opening up an unbroken support system to Start-ups.

The integration of Kerala with DPIIT and other major Start-up India initiatives can be traced by some of its important milestones throughout the year. In 2014, Kerala rolled out its Technology Start-up Policy that spearheaded infrastructure, funding and incubation to make Kerala one of the top five Global Start-up Ecosystems. In 2016, the DPIIT recognition process was initiated, whereby Start-ups that have been legally registered in Kerala are offered tax incentives and access to funds through the Start-up India program nationally. In 2017, Kerala Start-up Mission (KSUM) was commissioned as the nodal agency of the state on DPIIT integrated schemes and introduced an online Start-up registration facility to introduce efficiency. In 2018, the state came up with an Intellectual Property Support Policy, where Start-ups in the state can receive a cost reimbursement of up to INR 2 lakh on domestic patents and up to INR 10 lakh on international patents, to help Start-ups protect their innovations under the DPIIT category. The year 2019 also witnessed the unveiling of the Integrated Start-up complex in Kochi with incubation areas and R and D centres dedicated to the DPIIT-recognised Start-ups and a promise of 1000 crores of investment over the four years to strengthen the Start-up ecosystem. In 2020, Kerala enhanced the venture funds support through a Fund of Funds (FoF) with Memorandums of Understanding (MoU), backing Alternate Investment Funds (AIFs) with specific guidelines in line with the DPIIT provisions.

In an attempt to further support them, the state in 2022 paid the travel and VISA expenses to Start-ups to encourage them to attend national and international events, organised by DPIIT. As of 2024, the state hosts over 550 DPIIT-recognised Start-ups with operations across a variety of sectors, including, but not limited to, technology, healthcare, energy and agriculture. This sequence of years shows how Kerala is committed to the broader movement to promote entrepreneurship by being aligned to the roadmaps created by DPIIT as well as enhancing the takeaways at the state and

national levels. Manageable regulatory framework that goes hand in hand with DPIIT initiatives supports the Start-up ecosystem in Kerala. The various advantages of the Start-ups that were entered under DPIIT are the abatement of capital gains taxes, no compliance in self-certification under labour and environmental regulations and an entitlement to get government tenders with relaxed criteria. The KSUM-state DPIIT integration provides the channel to enable the dissemination of these benefits primarily through the lens of youth entrepreneurship and inclusivity.

The combination of state-level focused work and the national-level scheme supported by DPIIT forms an extensive support network between ground-level innovation and international markets. Kerala also partners with tech-heavy hitters such as Google Cloud, Amazon Web Services and payment gateways like Razorpay, to provide subsidised access to Start-ups, approved by the DPIIT. In addition, Kerala has an institutionalised system to foster the success of Start-ups through Innovation and Entrepreneurship Development Centres (IEDCs) in more than 230 technical colleges, through 10,000 would-be entrepreneurs. This DPIIT recognition opens gates to these Start-ups to scale their innovations with the absurdity of the government support at a state-level and even inter-country cooperation. The effective integration of Kerala and the superset of DPIIT and Start-up India has enabled Kerala with consistent policy support, financial benefits and incentives, infrastructure, intellectual property facilitation and international exposure to empower its Start-up systems. The concentrated effort has led to more than 550 DPIIT-supported Start-ups being registered by 2024, supported by institutional investment and development of the related ecosystem and makes Kerala one of the brightest lights in the Start-up landscape in India. The interdependent system of alignment and support enables Kerala Start-ups not only to be successful at a local level but also able to compete on a national and international front courtesy of the Start-up India framework enabled by DPIIT.

4.9 FINANCIAL SUPPORT SCHEMES

Financial support schemes for Start-ups are structured programmes provided by governments, financial institutions and private agencies to offer funding, grants, loans

and investment facilitation for new enterprises. These schemes aim to reduce financial barriers, encourage innovation, and accelerate Start-up growth, covering seed funding, venture capital, credit guarantees and special incentive programmes. By providing accessible capital, reimbursement for patents, tax benefits and risk-sharing mechanisms, financial support schemes empower Start-ups to develop products, scale operations, access markets and achieve sustainability, thereby fostering entrepreneurship, technological advancement and economic growth.

4.9.1 Seed Funding Programmes

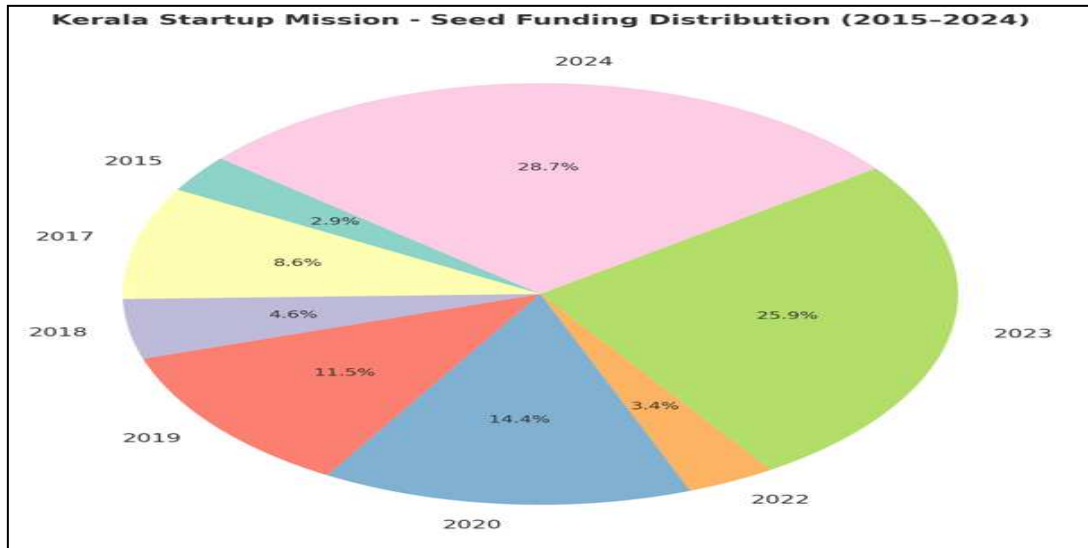
Since 2015, the Kerala Government, through the Kerala Start-up Mission (KSUM), has been increasingly funding seed capital to various innovative Start-ups and entrepreneurs in the state with an objective towards fostering early-stage entrepreneurship and technology-driven Start-ups. This Seed Fund Scheme at KSUM is essential in facilitating up to 10 lakh rupees soft loans to Start-ups to help in product development, testing, marketing and recruiting. The initial year of its introduction saw around 50 Start-ups being funded through seed investment, but the numbers increased much more in the years to come as the government increased the limit of funds raised as well as the eligibility criteria. In 2017, the seed fund limit was further raised to 15 lakh rupees, and it has helped over 150 Start-ups across the state to access financial help in amplifying their operations. In 2018, the government came up with the Idea Day Fund, aimed at the idea-stage Start-ups that further development of the prototype and initial validation. In the same year, approximately 80 Start-ups were beneficiaries of this move. In 2019, the funding mechanisms became more systematic, with the disbursement being linked to the achievement of specific, defined milestones, which assisted in helping over 200 Start-ups to systematically utilise funds to grow. Beginning in 2020, KSUM made improvements in terms of visibility and access with online seed fund application portal introduction and more than 250 Start-ups successfully secured funding. Along with increased attention to women entrepreneurs, the mission also began to pay special attention to women entrepreneurs in 2022 by offering specialised seed funding programmes with longer moratorium periods, including financing about 60 women-led Start-ups that year. Repayment flexibility

was further enhanced in 2023 when an option was introduced that would allow Start-ups to extend EMIs to 36 months, which eases their current financial pressure in order to foster sustainable growth.

This flexibility helped contribute cumulative financing of approximately 450 Start-ups as of that year. The momentum carried into 2024 and saw cumulative seed investments to more than 500 Start-ups in various industries, including IT, healthcare, energy and the agro industry. Kerala has experienced a strategic approach in the amount of funding, sector and stages of Start-ups in its seed funding ecosystem. The analysis between 2019 and 2021 has shown that there was a notable increase in productisation grants (funding to develop prototypes into market-ready products), with idea grants and scale-up grants seeing an initial drop in Start-up number and amounts of funding. Over 54 per cent of the seed financing was received by Start-ups in product as well as service markets, and most notable funding increased to enterprise applications, education technology, health-tech, artificial intelligence and Internet of Things (IoT). It is, however, acknowledged that there exist under-funded sectors, such as packaging, biotechnology, waste management, art and photography sectors and aeronautics, though it is needed by the sieve funds of the government. Other areas such as 3D printing, augmented reality, drones, big data, chatbots and Blockchain are emerging areas of interest where further targeted seed funding will be provided in the years to come. The seed funding initiatives of Kerala Start-up Mission, both in terms of provision of easily accessible financial support, stage range disbursement based on milestone achievement, industry-specific focus and inclusion of women entrepreneurs, have become the lifeblood of the thriving Start-up ecosystem in the state, which has enabled innovation, product development and market entry in the entrepreneurial sector. This is very much visible in the evolution of the progressive increase in funding, modernisation through online process, and diversification of the sector in which grants were being given, indicating the strong approach of the mission to build a healthy environment of entrepreneurship within Kerala.

Figure 4.4

Kerala Start-up Mission seed funding distribution (2015-2024)



4.9.2 Prototype and Innovation Grant Schemes

KSUM, since its inception in 2015, has contributed significantly to the origin and development of Start-ups in Kerala and has helped them in achieving their entrepreneurial potentials and has leading to the dynamic entrepreneurship ecosystem that has strengthened further. Throughout its history, KSUM has established many financial support programmes such as seed financing, innovation grants and prototype financing schemes that have made a great contribution to the Start-up ecosystem in the state. The emergence of entrepreneurship in Kerala has been supported by KSUM with more than 4,000 Start-ups touted in 2016-21 alone. In this duration, the state got inflows of venture capital of 551 million US dollars in the form of 110 deals with 40,000 employment providers. Its seed fund programmes have, since inception, supported more than 500 Start-ups providing loans up to 15 lakh rupees with ease in repayment tenure and milestone-based release to ensure transparency and growth. The Innovation Grant Scheme has so far invested more than 38 crores across over 700 projects that support Start-ups at various stages, including idea validation, product validation and productisation. Additionally, the grant scheme has focused on women and transgender entrepreneurs with specially provisioned grants.

The Start-up ecosystem in the state covers various fields, including IT, healthcare, energy, agriculture and different deep-tech areas like IoT and AI. The venture capital funds that SUM has invested in, such as Transition VC, secured an investment of 15 crore rupees in 2024 with an aim to support clean energy Start-ups operating with respect to sustainability and net-zero emissions. Interestingly, Kerala has a high literacy rate, favourable government policies and efficient incubation centers in Kochi, Thiruvananthapuram and Calicut, which have the infrastructure, mentorship, as well as access to investors. Networking events in frequent intervals and technology summits like the Seeding Kerala and Start-up Yatra create an atmosphere of collaboration and knowledge among Start-ups and investors. The net effect of funding and support programmes by KSUM is that Kerala has risen to become one of the most promising states in the country on the Start-up innovation front, by integrating technology, inclusive societal accessibility and sustainability to create Start-ups that have the capacity to compete in the global dimensions of innovation.

4.9.3 Scale-up and Acceleration Funding

KSUM has played an important role in offering scale-up and acceleration financing to the growth stage Start-ups since 2015, which is evidence of Kerala ensuring the advancement of Start-ups post-seed. Between 2015 and 2018, Kerala experienced the emergence of several Start-ups that received national-level funding based on innovative applications, including one under the India Innovation Growth Programme (IIGP) in 2018 that awarded seed funding of up to 25 lakh rupees through three KSUM-mentored Start-ups to help scale their operations and reach larger markets. The structured funding schemes available using SUM include Scale-up Grants of up to 15 lakh rupees to Start-ups which are focused on revenue maximization and spread to expand businesses Market Acceleration Grants of up to 10 lakh rupees to pilot commercialisation of Early- Stage Equity Funding through venture capital funds which have been approved through SEBI, with differentiated tickets ranging between 25 lakh rupees and 2 crore rupees. By 2019, Kerala had an active Start-up community with more than 1500 Start-ups announced, raising substantial amounts in funding, and a total 38 million USD in announced investments across 50 deals. New niches such

as fintech, SaaS, AI and hardware-based Start-ups were receiving funding with greater focus. In 2020 onwards, KSUM launched a FoF initiative investing through alternate investment funds that deployed capital to support high-potential Start-ups the resulting of faster scale and market penetration. In 2024, KSUM invested INR 15 crore in Transition VC, an investment fund concentrating on the clean energy sector, helping to achieve sustainability targets. The Start-up ecosystem will flourish in other districts, such as Kochi, Thiruvananthapuram and Calicut, and there will be over 5,000 Start-ups registered by KSUM by 2025. Nonstop government efforts have boosted incubation space to more than 4 lakh square feet, promoting growth-stage Start-ups with assistance of hands-on mentoring, investor connections and financial resources. These scale-up and acceleration programmes enable Start-ups to go from initial validation to market dominance and concretise Kerala as a clear Start-up hub in India, developing innovation-based economic growth and employment.

4.9.4 Grants, Venture Capital and Incentive Policies for Start-ups

Kerala Start-up Mission (KSUM) was created with the goal of weaving a dynamic Start-up ecosystem with the help of financial incentivising schemes and partnerships with venture capital (VC) and other angel investment groups. Since 2016, KSUM has introduced matching grant programmes in which the early-stage entrepreneurial ventures it finances with Innovation Grant funding of up to 15 lakh rupees are also eligible to attract equity investment by SEBI-registered VCs and angel investors. This two-pronged model of financing has greatly extended the scale of Start-ups through the combination of government investment with that of the capitalist. On the investor side, SUM boasts of an investor network of well-established and reputed VC funds covering ticket sizes starting from 25 lakh to 2 crore rupees, which include curated pitch events like Seeding Kerala, being held annually since 2018, where Start-ups have access and opportunity to pitch to investors and raise funding to pursue growth. There have already been more than 500 Start-ups which received such matched funding, enhancing their penetration and presence in the markets.

On the taxation and subsidy side, Kerala Start-ups identified under DPIIT enjoy a three-year taxation waiver, a capital gains waiver and reimbursement of patent filing

charges, which were sequentially initiated since 2016 to promote ease of doing business. The state government also offers subsidies on infrastructure rent and seed funding interest subventions, as well as reimbursement of travelling and visa costs of the Start-ups in the national and international innovation events. With these policies, the goal is to lessen costs as well as stimulate innovation and exposure to the global markets. By around 2022, there was an allotment of special considerations that subsidised women and transgender entrepreneurs under the Innovation Grant Scheme that helped to promote faster Start-ups. By 2025, there are at least 5000 registered Start-ups all over Kerala taking advantage of this favourable financial landscape, with Castle areas such as Kochi, Thiruvananthapuram and Calicut being the locations of interest. The combination of government funding and incentives from the perspective of almost 10 years has led Kerala to become a Start-up destination with an ample supply of innovation-enabled and market-smart Start-ups and provided fair access to capital and government assistance.

4.9.5 Special Start-up Financing Packages for Student Entrepreneurs

KSUM has taken a keen interest in the empowerment of student entrepreneurs in its full range of programmes and financial incentives particularly in the 2015-2025 era. The flagship effort is IDEA Fest, which has emerged as the benchmark for student innovators to translate their innovations or academic projects into viable business propositions. Over the years, IDEA Fest has offered grants of up to 2 lakh rupees as well as mentorship, lab support and product development. This formal pre-incubation programme takes place over three months and ends in a pitching competition to expert juries. In the last 10 years, the event received the participation of thousands of students across the state of Kerala, and thus Kerala became one of the largest networks of student innovation in the country, with over 530 Innovation and Entrepreneurship Development Centres (IEDCs) functioning in Engineering, Management, Arts and Science Colleges.

The other driving initiatives such as INSPIRE zonal events, i-Talk inspirational talks, WhyHack hackathons and Local Entrepreneurship Advancement Programme (LEAP) are the other student-led initiatives in the spheres of entrepreneurship education and

innovation challenges. In 2016, KSUM piloted an Idea Grant program with a dedicated student category where an idea was eligible to receive a grant of up to 2 lakh rupees to develop a prototype and conduct a preliminary validation of an idea. Since 2018, the NIDHI-PRAYAS scheme, developed in collaboration with the Department of Science and Technology, has offered greater grants of up to 10 lakh rupees to student innovators aimed at developing their prototypes in the 18-month project. This has further boosted the ecosystem of Kerala as they have been supporting high-potential student business models that had a proof of concept and an early productisation. Together, these initiatives have made Kerala achieve over 6,500 Start-ups by 2025, with a major portion made up of student-based Start-ups. The ongoing efforts of the government towards infrastructure development, training and funding schools into innovation centres has made educational institutes in Kerala a busy hub of innovation and has made it one of the most inclusive and impactful Start-up ecosystems in the country.

4.9.6 Women Entrepreneurship Support Schemes

Kerala Start-up Mission (KSUM) has embarked on a strong path towards women entrepreneurship by launching a number of specific support measures, grants and financial support units between 2015 and 2025. Such initiatives are devoted to intervention to overcome the difficulties specific to women entrepreneurship and the promotion of inclusivity in the Start-up community, which adds Kerala to the list of the top states in India in terms of gender-inclusive entrepreneurship. Since 2015, KSUM has been conducting the Idea Grant program, which provides up to 3 lakh rupees exclusively to women-owned Start-ups to move idea to the prototype stage and test their innovative ideas. The Idea Grant offered to women student innovators is up to 2 lakh rupees, which funds early-stage research and development. In 2017, the Productisation Grant has been further refined with the intent of helping women entrepreneurs, and now they get an added 5 lakh rupees on top of the standard amount of 7 lakh rupees, and explicitly focused on scale readiness and product-market fit.

To accommodate the financial limitations, in 2018, KSUM has introduced a Soft Loan Scheme to fund women-led Start-ups with a loan amount up to 15 lakh rupees, with a

subsidised interest rate of 6 percent with a moratorium period of up to two years and a flexible repayment option of a period of three years. This was especially directed at Start-ups where the government departments or public sector undertakings were guaranteed purchase orders and it simplified the working capital risk during the implementation of projects. In addition to it, the Market Access Grant launched in 2016 can grant up to 3 lakh rupees to women entrepreneurs in order to attend national and international trade fairs, conferences and network events to expand into new markets and gain global exposure. A key area of support has been the protection of intellectual property, whereby, since 2017, women entrepreneurs have been reimbursed up to 2 lakh rupees on domestic patents and up to 10 lakh rupees on international patents, thus encouraging women to innovate and protect and commercialise their innovation.

Since around 2019, KSUM has also increased support with the launch of the NIDHI Seed Support Program, providing US\$70,000 of early-stage equity funding to high-potential women-led Start-ups with particular emphasis on sectors where women are underrepresented (e.g. electronics, hardware). Ecosystem development has been further supported by the introduction of women-friendly incubation centres and co-working spaces to be gradually established since 2018, which provide substantial subsidies (40-50% discount) in the cost of infrastructure so as to reduce entry barriers. The data shows 20 crore and above in grants, loans and subsidies provided by KSUM to over 700 women-led Start-ups in the state of Kerala between 2015 and 2025. Though women founders constitute about 5 per cent of the entire Start-up scene, ongoing initiatives like K-WISE (Kerala Women in Start-up Ecosystem) and other programmes like Fail Fast or Succeed, Women Submit and Innovate HER have helped in cultivating leadership and entrepreneurship capabilities within women. On top of it, the socio-economic conditions, like the high literacy rate and supportive government policies, provide an enabling condition in the state of Kerala when a number of women entrepreneurs are in pursuit of Start-ups across technologies and other areas, including healthcare, retail and manufacturing, among others. The multifaceted tack that has been taken by Kerala in the last ten years with regard to offering extensive financial assistance, patenting, incubation programmes and market

access opportunities, has established a strong base of women entrepreneurship, making the ecosystem more diverse as well as robust at both state and national scale.

4.10 INCUBATION AND INFRASTRUCTURE SUPPORT

Incubation and infrastructure support for Start-ups refers to the provision of physical spaces, facilities, resources and mentorship to help early-stage enterprises develop and scale. It includes incubators, accelerators, co-working spaces, laboratories, fabrication labs and technology parks, along with access to mentors, industry experts, networking opportunities and business services. Such support enables Start-ups to reduce operational costs, refine business models, test prototypes and connect with investors, fostering innovation and sustainable growth. By providing a structured ecosystem, incubation and infrastructure support accelerates entrepreneurial success, commercialisation of ideas and employment generation.

4.10.1 State-Supported Incubators and Accelerators

KSUM is supported by incubator and accelerator programmes, state-funded by Kerala, and they make up the state-supported Start-up ecosystem. The figures of the Atal Innovation Mission (AIM) and KSUM of 2015-2025 prove that Kerala has already managed to set up a total of 63 incubators and accelerators throughout Thiruvananthapuram, Kochi, Kozhikode and Kasaragod. The facilities given offer sector-specific support where Start-ups obtain personalised assistance, mentoring and market connections. Recognisable centres are BioNest, covering the biotechnology field Maker Village, which deals with hardware and IoT and TechNest, which operates in the IT enterprise niche. The state has as well developed strategic accelerator programmes that aim at speeding up the development of Start-ups showing great potential. The Kerala Start-up Mission-EY Accelerator Program, introduced in 2015, is a good example. It has helped over 60 Start-ups through mentorship, investment readiness, as well as scaling plans, so that they become ready to compete with the dynamic markets across the globe. More than 600 Start-ups fast-tracked by these initiatives obtained venture capital funding (primarily in areas of AI, Blockchain, cleantech and life sciences), together exceeding USD 38 million over the period of

2017-21. Another major emerging contribution by state-supported accelerators has been the investor networking platforms.

Through flagship events such as Seeding Kerala annual demo days and pitch sessions, Start-ups have been able to connect with venture capitalists, angel networks and corporate investors. This has not only augmented the inflow of funding but also made Kerala appear as a national deep-technology centre. Accelerators also play a significant role in the survival of Start-ups. Economic Review 2024 of Kerala State Planning Board reveals that Start-ups incubated till date in programmes supported by KSUM are showing a higher rate of growth, sustainability, rapid product development cycles and industry linkage. These institutionalised support systems have institutionalised resilience in the Kerala entrepreneurship system. Moreover, the importance of accelerators as a means to encourage inclusivity should not be underestimated. Such programmes have been extended to semi-urban and rural regions, so as to make sure that innovation is not focused on the metropolitan cities, such as Kochi or Thiruvananthapuram. Having involved small entrepreneurs and grassroots innovators, Kerala has increased the social footprint of the Start-up ecosystem. By the year 2024, the incubators and accelerators funded by the Kerala state has made the state one of the main regions in India, fostering Start-ups using technology-driven solutions and environmentally friendly economic development. This institutionalised assistance has provided a favourable learning environment of entrepreneurial excellence and Kerala can serve as a pattern for other states of India to follow.

4.10.2 Fab Labs and Maker Villages as Innovation Hubs

Maker Villages and the Fab Labs have played a significant role in the Kerala innovation ecosystem, with their role even being reported in KSUM reports and in the Atal Innovation Mission published in 2023. Maker Village Kochi, India, a 30,000-square-foot facility opened in 2016 with prototyping-related equipment, such as 3D printers, CNC machines, laser cutters and advanced electronic workstations and is funded by the government. Such facilities have allowed entrepreneurs to get their products from idea to prototype quickly at a much lower cost and with fewer barriers

to hardware innovation. Since 2017, at least 150 Start-ups and innovators supported by Maker Village and other Fab Labs has worked on IoT, industrial automation, robotics, medical devices, and sustainability technologies. These facilities have led to the direct growth of Start-ups that support the agricultural sector, healthcare, renewable energy, waste management and environmental sustainability, as reported by Kerala Economic Review 2024. As an example, Start-ups that developed low-cost ventilators during the COVID-19 pandemic or automated agricultural solutions developed in these labs are evidence of their societal value. A major success of Fab Labs in Kerala is that they have become a part of the academic ecosystems. Fab Labs are now established within a new generation of enlightened teaching institutions, bringing high-end fabrication tools closer to the curriculum and within the reach of students, innovators and grassroots entrepreneurs.

The model fits into the global Fab Lab network, which originated out of MIT and establishes Kerala as a Southern Asian leader in the digital fabrication trend. By 2023, the network had flourished to more than 20 Fab Labs spread through Kerala, one of the largest state-wide deployments in India. Alongside infrastructure, the available services within Fab Lab and Maker Village include intellectual property (IP) support, access to seed funding, eMentorship and industry networking, something that helps Start-ups to become commercially viable. Between the years 2018 and 2024, it is reported that more than 70 patents and product designs have been developed by these hubs, some of which have been commercialised in overseas partnerships. Other events, like the FabLab Asia Network Conference (2019 in Kochi) added to this reputation of Kerala as a global hub of grassroots innovation. In such a way, Kerala Fab Labs and Maker Villages have made an innovation hub of hardware and prototyping in the state and have decreased the dependency on imports and built a culture of design thinking and deep-tech entrepreneurship, strengthening the overall Start-up ecosystem.

4.10.3 Development Centres (IEDCs) in Educational Institutions

Kerala has become a leader in the country in student entrepreneurship, mainly due to its extensive network of Innovation and Entrepreneurship Development Centres

(IEDCs). As of 2022, KSUM reports and the Atal Innovation Mission (2023) above, the state now has over 530 IEDCs in universities, engineering colleges and polytechnics. These centers serve as the initial contact points to the students venturing into the entrepreneurial world by providing mentorship, seed grants, incubation and connection to opportunities such as competition and innovation festivals. The scopes of those IEDCs are considerable. Every year, they introduce over 25,000 students to some form of activity, whether that be design thinking sessions and business model craft to hackathons or Start-up boot camps. High-profile events, such as the IDEA Fest (introduced in 2017), give students an incentive to present early-stage ideas. By 2024, IDEA Fest has already sustained over 2,000 student-innovative prototypes, many of which moved on to become veritable Start-ups developed through KSUM. IEDCs also helped incubate more than 4,000 student Start-ups in the period between 2018 and 2024, of which almost 600 moved to formal incubation by KSUM and other partner accelerators. Quite a number of such Start-ups are in the green field areas like AI, renewable energy, biotechnology and ed-tech underscoring the capacity of the state to indulge in deep-tech venture cultivation among students.

According to the Kerala State Planning Board in Economic Review 2023, these hubs had contributed immensely in commercialising research projects and thus provided a pipeline in turning academic works into successful business ventures. IEDCs also have a vital influence in imbibing a culture of entrepreneurship thinking. They periodically hold innovation festivals, market visits and skill boot camps to meet the needs of the market with the educational requirements. Notably, such initiatives have increased the levels of inclusion since women and rural students are now a part of the Kerala Start-up ecosystem. Collaborations with the giants in the industry and international bodies also augment these centers. A good example is its partnerships with Google for Start-ups, IBM and Microsoft to conduct training on AI, cloud computing and digital businesses. On par are alliances with NITI Aayog with Atal tinkering laboratories that put IEDCs in unison with the national sensibilities of innovation. By 2025, the IEDCs in Kerala have become a self-sustaining form of youth entrepreneurship that will have spawned thousands of first-time innovators.

They have been merged with academic curricula, creating a functional continuity within Kerala to what has been termed as India's most youth-led Start-up ecosystem.

4.10.4 International Accelerator Programmes and Market Access Support

KSUM has consistently ensured that Kerala Start-ups stand on the global map with the focal goal of involving them in international accelerator programmes as well as promoting their access to the markets. It is based on the KSUM International Outreach Reports (2018 - 2024) and the evaluation of the Atal Innovation Mission (NITI Aayog, 2023), more than 200 Start-ups in Kerala have been nurtured to engage in global accelerator programmes and innovation ecosystems in Silicon Valley, Singapore, Dubai and Europe. The programmes have allowed Start-ups to access formal mentorship, cross-border investor communities and exposure to international business models and thus raise their global competitiveness. Since 2018, the KSUM has started to implement overseas acceleration, which consists of direct programmes aimed at accelerating Start-ups within the field of high growth, including AI, health tech, fintech, Agritech and cleantech. By 2019, funding of travel grants and subsidisation of participation at international conferences, exhibitions, demo days and pitch sessions were launched, to allow resource-poor Start-ups to attend such events. The key international connections are that they took part in Slush (Finland), Dubai Expo 2020, Singapore Fintech Festival, and collaborate with Accelerator platforms in the U.S. (Plug and Play Tech Center, Silicon Valley).

The effect of all these efforts can be seen through the increase in the number of Start-ups obtaining cross-border investments, joint ventures and multinational alliances. As an example, Kerala had an international funding of USD 22 million between 2019-2024, with several companies in India setting up offices abroad to increase their market presence. Examples of health-tech Start-ups conducting pilot projects at European hospitals and IoT Start-ups working with Dubai-based industrial companies will be provided. On the local front, the global investor integration is enabled by the annual investment summit in India, named and run by KSUM, Seeding Kerala. The summit has attracted over 500 angel investors, 200 venture capitalists and 100+ international participants and resulted in multiple funding negotiations and

partnerships since its inauguration in the year 2016. Since it first took place in 2012, the event has attracted over INR 250 crore in investment commitment, elevating Kerala within the international network of money. International accelerator linkages have enabled Start-ups to have immersion programmes, where Start-ups are exposed to different regulatory, finance and cultural environments through short-term stays in hubs such as Berlin and Singapore. Such experiences have refined the go-to-market approach in Start-ups, making them less disruptive to scale up globally. Due to that, Kerala now stands as a recognisable destination for worldwide connected Start-ups. Not only has its global presence increased the market access of entrepreneurs, but it has also increased the quality and visibility of innovation in the state, which is part of India's vision of being a global Start-up leader.

4.11 ACCESS TO CREDIT AND INSTITUTIONAL FINANCE

Access to credit and institutional finance for Start-ups refers to the availability of funding through banks, financial institutions, venture capital, angel investors and government-backed credit schemes to support early-stage and scaling enterprises. It includes term loans, working capital, credit guarantees, seed funding and equity financing, enabling Start-ups to manage operational costs, invest in technology and expand their business. Reliable access to institutional finance reduces financial barriers, mitigates risks and fosters innovation, helping Start-ups achieve sustainable growth, market competitiveness and long-term economic contribution.

4.11.1 Loans and Financial Assistance

Institutional backbone in terms of funding of small Start-ups and MSMEs in Kerala includes Kerala Financial Corporation (KFC) and Kerala State Industrial Development Corporation (KSIDC). The KFC was founded in 1953 and has developed into one of the most efficient state financial corporations of India that facilitates long-term, low-cost credit in the areas of industrial and entrepreneurial development. The Annual Report 2023-24 of KFC says that the loan portfolio of KFC stood at 7,368 crore, and the net worth was 1,064 crore. This has been reported in the form of a 47.54 per cent growth in the net profit, which stood at 74.04 crore in the current fiscal over the previous one in an indication to the financial efficiency of

operations of the institution as well as strong credit demand among Start-ups and small businesses. In the past ten years, the company has approved loans to almost 65,000 businesses, many of them Start-ups and MSMEs. The schemes are specific to seed capital, working capital, project financing and expansion undertakings. The Start-up Kerala Scheme that was implemented in the 2010s is where the first-generation applicant will have easy access to loans, partially with an up to a 3-year moratorium and repayment planning to 20 years, enabling long-term sustainability. Interest subvention programmes have been conceived with woman-led technology-driven manufacturing Start-ups, helping in reducing the cost of borrowing capital and promote innovation-led business.

KFC is complemented by Kerala State Industrial Development Corporation (KSIDC), which acts in the capacity of loan provider and equity investor. SIDC provides loans and quasi-equity financing of up to 40 crore to early and scaling-up ventures. In its Annual Report 2024- 25, the body already mentions flexible repayment tenors, industry-specific financing models and moratorium options to support Start-ups with high-risk, high-growth industries like biotechnology, cleantech, artificial intelligence and advanced manufacturing. The best synergetic initiatives of the two institutions include the Chief Minister's Entrepreneurship Development Programme (CMEDP), received jointly with KFC. By 2016, the scheme had already issued 190.46 crore to 1700 units, bringing up new businesses in Kerala. Over the eventful subsequent years, both KFC and KSIDC diversified their Start-up-centred schemes to integrate with the Kerala Start-up Mission (KSUM), and introduce systematic credit and equity financing channels. KFC and KSIDC are two pillars of a strong financial system to address the entrepreneurship of Kerala. By providing flexible terms on credit, subsidised rate of interest and equity participation, these institutions have aided in generating employment, industrial expansion and Start-up sustainability, which has made Kerala one of the most financially inclusive Start-up hubs of India.

4.11.2 Bank-Linked Credit Facilities for Start-ups

Credit programmes that are associated with banks have opened up access to capital to a great extent to Start-ups and small companies in Kerala. The most important among

these programmes is the Pradhan Mantri Mudra Yojana (PMMY) which was launched in 2015 to supply loans to micro and small businesses bland of collateral. The Ministry of MSME reports (2016-2024) indicate that Kerala-based Start-ups and small firms have taken more than 1,200 crore in PMMY as a boost to the innovations in the field of IT-based services, agro-processing, handicrafts and local production. Particularly important to entrepreneurs in the rural and semi-urban areas, these loans are classified as Shishu (below 50,000), Kishor (50,000-5 lakh) and Tarun (5-10 lakh). The Economic Review 2023 of Kerala states that the percentage of Mudra loans in Kerala is gaining momentum the average increase in disbursement over the last few years has been 12 percent.

These facilities have been inclusive, especially among women-led Start-ups, where it has contributed to about 30 per cent of beneficiaries of Mudra loans in Kerala. The Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) has been introduced in Kerala since 2012 and acts in supplementation of Mudra loans, as it assists in offering credit guarantees free of collateral. This has facilitated banks to give loans of higher value at a lower risk. In 2024, more than 3,000 Start-ups and MSMEs in Kerala had availed credit protections of nearly 800 crore rupees, thus they were not heavily reliant on the need of traditional guarantees to secure credit. Kerala has also enjoyed central schemes that are focused on the state, such as the Stand-Up India Scheme (2016), a loan-granting scheme that targets women and SC/ST entrepreneurs and the Emergency Credit Line Guarantee Scheme (ECLGS, 2020-2023) that has assisted businesses to survive during COVID-19 times. As per RBI, the penetration of debt among the Start-ups in Kerala has been better and the NPAs on Start-up-related bank lending were also below the national average since exceptional monitoring and flexibility were ensured. The interest subvention and reimbursement programmes of the state further stabilise the credit possibility of bank-tied credit. As an illustration, the Start-up Reimbursement Policy (2019) offered by the Kerala government reimburses a percentage of the interest incurred over time on the bank loans, so that Start-ups can have their working capital handy to expand their operations. Therefore, the bank-linked credit system of Kerala incorporates central plans, state subsidies and

risk-sharing patterns, making it possible to provide liquidity, stability of funds and room to grow to even resource-poor entrepreneurs.

4.11.3 Credit Guarantee Schemes: CGTMSE Implementation in Kerala

The Credit Guarantee Fund Trust Scheme for Micro and Small Enterprises (CGTMSE) scheme, that was implemented all over the country in 2000 and in Kerala in 2012, has played a key role in ensuring credit access to Start-ups and micro and small enterprises in Kerala. CGTMSE entices the banks to lend money to the first-generation entrepreneurs, female Start-ups, and entrepreneurs who cannot offer any collateral to the bank by insuring their loans up to 2 crores. By 2024, the scheme has advanced over 3,000 Start-ups and MSMEs in Kerala, securing almost 800 crore worth of guaranteed business loans, according to the annual reports of CGTMSE as well as the Economic Review 2023 by Kerala state. This movement of capital has filled the financing gaps, especially in the fields of renewable energy, IT services, manufacturing and agro-processing. Since 2016, there has been a steady rise of sanctioned guarantees in Kerala, averaging 7-10 percent, rising annually, indicating the increased dependence of banks and entrepreneurs on the program. Notably, CGTMSE has also reduced NPA levels of Start-up loans in Kerala compared to business lending in the traditional way. This effectiveness is due to strict vetting processes and monitoring systems superimposed after issuing the credit, which makes sure it is well utilised.

The plan has been of great influence, especially during crises. An example is the COVID-19 pandemic (2020-22), when CGTMSE-guaranteed loans helped hundreds of Start-up businesses in Kerala endure tight liquidity times in Kerala. A lot of these companies then had the capacity to grow, repay their borrowings as markets stabilised and access venture funding. The state has also localised the implementation of CGTMSE as a part of inclusive banking policies by RBI through state-level bankers committees (SLBCs) that were established to ensure efficient coordination between the state government agencies, banks, and the entrepreneurs. This has promoted regional credit penetration to semi-urban and rural areas. The inclusivity in the scheme can be seen through the benefits that are offered to women entrepreneurs and SC/ST

innovators, most of whom do not have collateral to secure financing through formal banking sources. It has been reported that women-led Start-ups got nearly 22 percent of CGTMSE-supported loans in Kerala by 2023, which is in line with the objective of gender empowerment in general. Some have touted the success of CGTMSE in Kerala as a guide to implementing risk-sharing models in other states in India. It has increased entrepreneurship, employment and access to finance by filling the financing gap, making Kerala a promising Start-up destination.

4.11.4 Equity and Venture Funding Support

Loans and guarantees, Kerala has also encouraged equity and venture funding regimes to fund high-growth Start-ups. The Kerala State Industrial Development Corporation (KSIDC) has fairly matured into being one of the dynamic equity investors in a typically loan-oriented corporation. Its Scale-up Funding Scheme in 2024 saw funding caps being increased to 1 crore per Start-up, and targeted applications in artificial intelligence systems, Blockchain, clean energy, biotechnology and advanced manufacturing. The KSIDC Annual Report 2024 indicates that it has already invested more than 100 crores in equity and quasi-equity instruments (between 2020 and 2025) through collaborations with SEBI-registered venture capital funds and private equity firms. Interesting alliances noted are investments in Transition Ventures and Kerala Venture Capital Fund that invest in Start-ups that have great scaling potential and the ability to export. These efforts have been backed by the Kerala Start-up Mission (KSUM) that aids in fund origination diligence and due diligence, thus lowering risks to institutional investors.

Such integration means that through investments, Start-ups will not only have access to funds, but also organised mentoring, administrative structures and connections with international markets. 2021-2024 Case studies include Kerala-based Start-ups that have raised multi-crore equity-based later-stage funding after initial equity participation by KSIDC and the health-tech and ed-tech sectors' recording significant success here. Some of these Start-ups have gone global, not only adding to the Kerala export diversification, but also to technological branding. The Seeding Kerala investor summit has also become an important destination when it comes to equity funding, as

it has been happening annually since 2016. By 2024, the event had resulted in more than 250 crore worth of commitment in investment, where both domestic and foreign venture capitalists invested. Equity-based funding augments the debt financing system prevalent in Kerala and makes the Start-ups' access to risk capital, which is necessary to support innovation-driven and R&D intensive businesses. Compared to loans, equity funding will cut down on repayment obligations, which will allow Start-ups to use profits to expand operations. Cumulatively, Kerala has seen a high rate of growth in its venture capital ecosystem; with an annual growth of a remarkable 20%, the state is very much on the been-there-done-that level when compared to venture capital regions like Karnataka. By 2025, with KSIDC in the lead, the state is looking forward to a status as an economic powerhouse driven by technology, which will be ordained by a thriving pipeline of equity-financed Start-ups.

4.12 SKILL DEVELOPMENT AND MENTORSHIP INITIATIVES

Skill development and mentorship initiatives for Start-ups refer to programmes designed to enhance entrepreneurial capabilities, technical expertise and business acumen among Start-up founders and teams. These initiatives include training workshops, bootcamps, leadership programmes, innovation labs and one-on-one mentoring by industry experts, successful entrepreneurs and academic professionals. By guiding business planning, market strategy, regulatory compliance, fundraising and technology adoption, these initiatives help Start-ups refine ideas, overcome operational challenges and scale sustainably. Strong mentorship and skill-building frameworks are critical for fostering innovation, resilience and long-term growth within the Start-up ecosystem.

4.12.1 Entrepreneurship Development and Founder Bootcamps (KSUM)

KSUM actively provides Entrepreneurship Development Programmes (EDPs) and Founder Bootcamps where budding entrepreneurs are equipped with the necessary skills and knowledge to run strong Start-ups. KSUM has since been propagating such programmes in the entire state and finds solutions to turning the brilliant ideas generated into a commercial product in the real world. KSUM annual reports have indicated the engagement of more than 8,000 during the period 2018 to 2025 in

bootcamps and workshop programmes in collaboration with the industry experts and academic partners of KSUM. Accentuated at these bootcamps is the theory of lean Start-up, product-market fit, financial strategy and the process of fundraising. One premium bootcamp, Fail Fast or Succeed, launched in 2022, enables Start-ups to recognise areas in their operations that they may need to pivot around in rapid growth.

The hybrid incubation programmes, like the possibility of a wake-up program, include providing personalised mentorship and access to investors to women-led Start-ups. Thematic bootcamps were introduced in 2021 that can support focused innovation opportunities or areas of interest to Kerala in areas such as climate-tech, health-tech and agritech. Partnerships with leading institutions like IIM Kozhikode, IIT Palakkad and CUSAT make programmes more robust, as thinking leadership and global best practices can be incorporated in the same. As per KSUM 2024 Annual Progress Report, KSUM so far has produced more than 1,200 Start-ups that successfully scaled and post-program participation which has resulted in direct employment to over 7,500 people and investments of over Rs. 150 crore. Other alumni Start-ups, such as GenRobotics and NavAlt Solar, have proceeded to get national press and international venture capital. These programmes play a vital role in developing entrepreneurial potential, innovation and a solid Start-up ecosystem in Kerala. By the year 2025, KSUM intends to take bootcamp into the rural community with the virtual delivery format thus, entrepreneurship will be more open and accessible beyond the urban centers.

4.12.2 Hackathons, Investor Engagement and Start-up Networking

The hackathons, investor connects events and Start-up networking platforms are an essential triangulation in the KSUM innovation roadmap to fast-track innovation advancement and raise funds. KSUM has held more than 50 hackathons that involved more than 15,000 students, professionals and Start-up founders since 2016. These brainstorming and coding contests create an innovation buzz in fields like AI, healthcare, fintech, mobility, edtech, sustainability, etc. Reports by KSUM show that about 200 prototypes have been processed during hackathons between 2018 and 2025 have gone through to the incubation or funding stages. Its Investor Connect forums

and pitch events, held on a continuing basis since 2017, have brought together Start-ups and angel investors, venture capitalists and venture arms of large corporations in over 500 one-on-one meetings. The grand investor summit of investor-called Seeding Kerala, invites more than 300 Start-ups and 100 investor delegates, creating a cumulative funding of over Rs. 100 crores by the year 2023. As well, international-based investor road shows, which have been organised in Dubai and Singapore since 2022, have connected Kerala Start-ups with international venture networks. Regional community networks such as Huddle Kerala, IEDC Summit and Women Start-up Summit are available throughout the year, offering endless opportunities in terms of community building and co-working. Feedback surveys indicate that more than 78 percent of the respondents have gained more investor exposure and mentorship-related networks after such events. KSUM has also started virtual matchmaking platforms wherein artificial intelligence-based applications are used to match Start-ups with investors, industry mentors and other stakeholders so that the year-long involvement happens beyond actual physical interaction. These networks have played a central role in increasing the level of conversion of investments, making Kerala a land of booming Start-ups.

4.12.3 Mentorship Initiatives through Higher Education Institutions

The one pillar of the Kerala entrepreneurial ecosystem is mentorship, where it is closely connected to the academic institution through the Innovation and Entrepreneurship Development Centres (IEDCs) and IIM Kozhikode Innovation Lab. KSUM has been able to set up more than 530 IEDCs in engineering, medical, science, arts and management colleges in the state since 2015, training more than 25000 students per year. They offer formal mentorship by faculty, veterans from the industries and successful entrepreneurs to take the Start-up through the stages to the market. Innovation Lab The IIM Kozhikode Innovation Lab, which was inaugurated in 2019, is a leading mentorship center with high-end resources and research partnerships as well as a venture capital network. According to data provided by the KSUM 2023 report, over 4,000 student Start-ups which have been incubated in IEDCs have had access to the support of mentors who has meant that they could develop

prototypes and introduce themselves to the pilot market. FarmAI, Astrek Innovations and Sascan Meditech are some of the notable Start-ups that can be traced back to IEDCs. Mentorship programmes are on matters of business basics, compliance with regulations, investor preparedness and market traction.

IEDCs roll out customised bootcamps, leadership summits, ideation sessions and peer learning, drumming up a mindset of entrepreneurship at a young age. The Kerala State Planning Board notes that the IEDC network has been facilitating the process of breaking down the gap between academia and industry, highlighting the increased employability and in creating university-industry synergy. By 2025, IEDCs have started to implement AI-based mentor matching processes, so that student innovators are referred to mentors based on their sector/ area levels. These efforts are playing a part in fostering the sustainable growth of Start-ups, strengthening skills and having wider socio-economic impacts across the state.

4.12.4 Kerala Development and Innovation Strategic Council (K-DISC) and Skill Development

The Kerala Development and Innovation Strategic Council (K-DISC), that was developed in 2017, performs a strategic role in further development of entrepreneurial and innovation capacity in accordance with the objectives of the Kerala Start-up Mission. K-DISC collaborates with government, academic and industry stakeholders to plan and execute skills development models in key sectors identified as a priority in Kerala's industrial policies, including AI, Blockchain, robotics, clean energy and life sciences. Reports made on an annual basis by K-DISC show how, since 2018, several programmes have been established in collaboration with others in order to equip youths and entrepreneurs with skills in digital, product development and business management. These programmes have trained over 10,000 youth and entrepreneurs. The major projects, such as the Young Innovators Programme (YIP) and Skill Delivery Platform Kerala (SDPK), have proven to be of significant help in giving school and college students an opportunity to undertake innovation projects with the support of mentoring and funding. By the year 2023, the YIP itself has, on its own, enrolled more than 20,000 school children in innovative challenges in all

districts. K-DISC also supports innovation challenges, incubation and mentorship programmes in accordance with the growth of the Start-up and industrial ecosystems in Kerala. Combining the training on skills with the promotion of innovation, K-DISC will provide a stream of talent prepared to serve in high-growth areas. It is also an advocate of entrepreneurial inclusion of women, marginalised communities, and innovators based in the countryside. In 2021-2024, data indicates that rural engagement has increased by 35 % and there is a significant increase in the entrepreneurial ventures initiated by women. K-DISC actively works on the policy innovation role, contributing its expertise to the state on the implementation of future technologies, Industry 4.0, green economy shifts. Its compatibility with the Start-up policies of Kerala and the structure of KSUM enables it to continue with an innovation-led economic growth path. Through K-DISC, By 2025, plan to increase our innovation hubs to tier-2 and tier-3 towns, creating solutions to address skill development and making entrepreneurial opportunities more equal.

4.13 START-UP PERFORMANCE OUTCOMES

Start-up performance outcomes refer to the measurable results achieved by Start-ups in terms of business growth, financial sustainability, innovation and market impact. These outcomes include revenue generation, job creation, successful product development, investment acquisition, market expansion and social or environmental contributions. Monitoring performance outcomes helps assess the effectiveness of policies, financial support, incubation, mentorship and infrastructure provided to Start-ups. Strong performance outcomes indicate a healthy, scalable and innovative Start-up ecosystem, demonstrating that Start-ups can contribute to economic development, technological advancement and societal well-being while sustaining long-term growth.

4.13.1 Growth in Number of DPIIT-Registered Start-ups in Kerala

DPIIT-registered Start-ups in Kerala have proliferated and the Kerala Start-up ecosystem has grown exponentially in recent years. By 2025, Kerala is helping to sustain over 3,500 online businesses with the Kerala Start-up Mission (KSUM) supporting the growth of over 6,400 Start-ups in total. A 147 percent increase in

ecosystem value was realised by the state in 2025, an indication of a flourishing Start-up flow along with swelling investor interest. At an average growth rate of 20 per cent, the Kerala Start-up ecosystem is increasing every year. Start-ups that have been registered by DPIIT in Kerala are in various fields such as AI, Blockchain, machine learning, big data, robotics, tourism and logistics. The government's policy interest is to promote innovation, such as K-SWIFT, to an easier process of approving business and industrial policies on 22 key industries. Cities like Kochi and Thiruvananthapuram are fast becoming a primary destination of global capability centres (GCC), corporate investment and Start-up development. Create about 65,000 Jobs. Engage over 100,000 students annually in its network of 63 incubators \$ with 665 million in funding. Early investments in technology, intellectual property, government grants, mentorship and collaborations with tech giants such as Google Cloud and Amazon Web Services have also developed the Kerala Start-up ecosystem.

According to the Kerala State Planning Board and NASSCOM reports, Kerala is also a top performer across the country in the area of Start-up ecosystem creation, with all the necessary policy frameworks and investments being laid down to specifically develop entrepreneurship in the state. The growth in the number of Start-ups along with the value of the ecosystem is in line with the role of Kerala, which has been highly literate with skilled workforce and services a robust institutional support in favour of Start-ups since 2016, where the majority of the Start-ups have been founded in the past decade. KSUM-enabled Start-ups in Kerala have shown enormous growth in the number of DPIIT-registered Start-ups since 2016 due to its enabling ecosystem, government policies and sector focus on AI, robotics and sustainability technologies. The increase in the number of Start-ups and their ecosystem value is on a steep rise and Kerala is very likely to be one of the top Start-up hubs in India.

4.13.2 Sectoral Distribution of Start-ups Funding through State Schemes

The sectoral distribution of Start-ups receiving Kerala state funding are highly varied, which may be seen as reflecting the state-wide industrial policy, but also the specialised areas of focus that the innovation targeted . Support to KSUM is helping Start-ups in various sectors like Information technology and software services,

healthcare and life sciences, AI and robotics, Agritech, tourism and electric vehicle (EV) manufacturing in a very effective manner. The Industrial policy has identified 22 priority sectors, where it has been making significant investments in AI, Blockchain, machine learning, big data, robotics, tourism and logistics as well as focusing on technology-driven entrepreneurship and high-impact innovation. There are 6477 promoted Start-ups recognised by the Department of the Promotion of Industry and Internal Trade (DPIIT), and this also indicates the vibrant and growing culture of innovation in Kerala as of January 31, 2025. There is also the SUM, which hosts itself more than 4000 learning Start-ups that help provide entrepreneurship to the 14 districts of the state. Key hubs at Kochi, Thiruvananthapuram and Kozhikode have undergone remarkable development, and Kozhikode has registered a 54.53 per cent yearly rise in the number of Start-ups in the period of 2019 through 2024. Other upcoming hubs have been Kannur, Kollam and Palakkad, which are increasingly becoming hubs of young innovators and Start-ups in a specific sector. Start-ups funded through state schemes have created tens of thousands of direct opportunities, which have benefited the economy by improving economic growth, academic retention and innovation-led advancement. Not only does this increase global competitiveness by getting these Start-ups involved in international accelerators, expos and investor summits, but it also gets the Kerala-based innovations in front of global markets. The policy of the state is based on inclusive innovation, and it is planned to provide additional support to women-led Start-ups, innovators in the category of rural and socially responsible enterprises. Programmes such as WE GROW and special funding windows make sure that not only do the cities have entrepreneurship as an option. The sectoral reflection exhibits a strategic focus on the emerging and high-growth industries.

The IT and software services industry, artificial intelligence and robotics, healthcare and life sciences, Agritech and food technology, tourism and wellness, electric vehicles and clean technology and logistics are the mainstay of Kerala's technology-led innovation strategy. The above industries together assist the state in three areas in its sustainable development goals enabling economic growth, creating employment and adopting technologies. Infrastructure is also an important factor, including Cyber

park, Techno park, government incubation centers and digital innovation platform to provide office space, mentorship, networks and access to venture capital. Policy interventions enable simplification of ease of doing business, simplification of regulations, as well as funding of Start-ups and that is aligned with national policies like Start-up India. There is an increased focus on the adoption of technology, research commercialisation, and industry-academia collaboration, and as a result, Start-ups can scale quickly. The state also fosters Start-ups to invest in social and environmental sustainability, including clean energy, waste management, Agritech innovation and digital healthcare solutions. In general, the Kerala Start-up ecosystem portrays a moderate collectivity that integrates diversity of industry, inclusivity, technological advancement and policy initiatives to empower its status as an innovation hub in the country.

Table 4.4

Sectoral Distribution of Start-ups Funded under Kerala State Schemes

Sector	Description	Approximate Share of Funded Start-ups (%)
IT & Software Services	Application development, IT consulting, digital solutions	25%
AI & Robotics	Start-ups in artificial intelligence, machine learning, robotics	20%
Healthcare & Life Sciences	Medical technology, health services, pharmaceuticals	18%
Agritech & Food Tech	Agriculture technology, food processing	12%
Tourism & Wellness	Sustainable tourism tech, Ayurveda digital platforms	10%
Electric Vehicles & Clean Tech	EV manufacturing, IoT-enabled green technologies	8%
Logistics & Others	Supply chain solutions, blockchain applications	7%

Source: Kerala State Planning Board's *Economic Review-2024*

4.13.3 Patents Filed and Innovations Supported via State Initiatives

The government of Kerala, through Kerala Start-up Mission (KSUM) and under the Kerala Technology Start-up Policy in 2014, has given a major boost to Start-ups through promotion of innovation, including patent filing and reimbursement schemes. Knowledge Surge, KSUM offers financial support in the form of an Innovation Grant scheme with categories including Idea Grant (up to Rs. 3 lakh), Productisation Grant (up to Rs. 7 lakh), and Scale-up grants (up to Rs. 15 lakh) to allow Start-ups to transform ideas into full-blown ventures. In particular, patents have a Patent Reimbursement Scheme which covers up to Rs. 2 lakh on an Indian patent and up to Rs. 10 lakh on a foreign patent on a single topic of work, and includes reimbursements for managers like drafting, reproduction, prosecution and granting. Since the initiation of the scheme, approximately Rs. 74 lakh reimbursement was provided with a view to provoking a robust intellectual property framework in the state. Eligibility consists of being incorporated in the state of Kerala within the last 10 years and the patent application has to be filed after November 9, 2015. These programmes will help cut down the cost factor and encourage innovation in entrepreneurship, leading to economic growth in Kerala. Also, the central Start-up India scheme benefits include tax holidays and speedy patent processing in addition to those listed above. Extensive incubation and development programmes offered by KSUM cover hundreds and even thousands of prospective entrepreneurs throughout academic institutions, bundling together innovation infrastructure R&D intensity and commercialisation capabilities as elements of the state Start-up ecosystem design.

4.13.4 Employment Generation by Government-Supported Start-ups

KSUM has played a key role in the development of the state Start-up ecosystem in India, making Kerala a major hub of innovation. As per the recent KSUM impact reports and DPIIT Start-up India statistics, since its inception, KSUM has assisted more than 6,400 Start-ups and its funding percent of about \$665 million (approximately 58 billion). This ecosystem development has led to the production of about 65,000 jobs, as the state is having over 100,000 students in its circuit of 63 incubation centers and over 20 IoT labs. Closely related, but an ecosystem value in

2025 is even higher with a 147 percent increase in the state, indicating a massive increase in the creation of Start-ups and the closer inclusion in the world innovation systems. More than 3,500 active Start-ups characterise the Kerala Start-up ecosystem, with a variety of selected ventures entering AI, Blockchain, machine learning, big data, robotics, the tourism industry, logistics and the electric vehicle (EV) industry. In order to make the investment process and industrial growth less bureaucratic, Kerala has implemented K-SWIFT, an online process that allows approval of 52 new industrial parks in only eight months.

The industrial sector in the state is on track to grow to some 15.1 billion by 2028, which in turn will see more MSMEs contributing to national and international endeavours like space missions like the Chandrayaan and Mangalyaan. In Kerala, an AI policy was inaugurated in 2024, budgeting up to half a million dollars into investment in AI Start-ups with investments of more than a million dollars, aided by infrastructure development projects known as global capability centers (GCCs) in the cities of Kochi and Thiruvananthapuram. Such cities are emerging as important destinations of GCC expansion, thereby furthering corporate and investor interest. Both reports related to the Kerala State Planning Board, including the Economic Review, note that Start-up driven industrial growth is complementing an overall Gross State Domestic Product (GSDP) of \$150 billion by 2024-25, an 11.7 percent growth over the prior year. State agencies have aided Start-ups in receiving government grants of more than 27 crore rupees, seed investments of 11crore and taking part in government procurements valued at 5500 crore, which further highlights the presence of a strong institutional framework. CSR does not just lend funds, but includes mentorship, community functions, accelerators and femtocells to create technology innovation and entrepreneurial development cells (IEDCs) in more than 519 institutions. Such combined efforts, as reflected through annual impact reports, demonstrate a detailed policy environment that fosters innovation, entrepreneurship and job creation hence, Kerala is currently one of the most developed states with a broad-based development focus using technology-based growth and employment creation.

4.14 Kerala's Contribution to India's Start-up Ecosystem and Future Roadmap

Kerala has become an important driver in the Indian Start-up ecosystem, with one of the most vibrant and inclusive innovation landscapes growing at a rapid rate. Having over 6,400 Start-ups supported by Kerala Start-up Mission (KSUM) and an ecosystem that is surging at the rate of 20 percent each year, Kerala has created around 65,000 direct jobs and has nearly amounted to half a billion dollars (or 58 billion INR) in funding to Start-ups by the year 2025. The gross state domestic product (GSDP) of the state is estimated to come to \$150 billion in 2024-25 with an annual growth of 11.7%. Kerala has a moderate ecosystem with deep tech, including deep tech like AI, blockchain, machine learning, robotics, big data, tourism, logistics and EV manufacturing.

The 2024 Generative AI Conclave, which revealed the state's industrial policy, puts a focus on 22 key areas and it centers on facilitating investment via digital solutions such as K-SWIFT, which has approved 52 new industrial parks in eight months. Other actions taken by KSUM to support innovation are through the network of 63 incubators and over 500 education-based Innovation and Entrepreneurship Development Centres (IEDCs), providing opportunities to more than 100,000 students each year, yielding a powerful talent pool. The government offers grants, seed funds, patent reimbursements, mentorship and a direct procurement policy where Start-ups can work with government departments. This dedication to local innovation at the grassroots level and social investment makes the Kerala ecosystem one of the most inclusive in the world, with Start-ups emerging not only in urban centers but also in rural and semi-urban areas. In the future, Kerala has the potential to capitalise on its advantages with special emphasis on deep tech, eco-friendly technologies and innovation-driven business. In Kochi and Thiruvananthapuram, it is promoting the growth of global capability centers (GCCs) and developing the infrastructure and supporting facilities needed to enable local innovation, including an integrated EV manufacturing park. Kerala will aim at emerging as a leading destination for global enterprises and technology Start-ups by 2028, with the aim of reaching a total valuation of its industrial sector of up to \$15.1 billion. By implementing constant

policy improvements, infrastructure building and keeping with the theme of inclusivity, Kerala is charting the future roadmap of integrating technology with social impact and ensuring sustainable economic growth and diversified job creation throughout the larger Indian Start-up environment.

4.15 Initiatives and Support Systems for Start-ups in Kerala

Kerala has positioned itself as a leader in India in terms of the promotion of Start-ups by means of visionary policies, institutional encouragement, financial incentives and a strong entrepreneurial ecosystem. The central point in all these endeavours is the Kerala Start-up Mission, that was created in 2006 as the state-wide agency to facilitate innovation and entrepreneurship. The mission offers an integrated platform with mentorship, incubation, funding, networking and international connections, which closely aligns with the Start-up India program offered by the Department of Promotion of Industry and Internal Trade to enhance integration of Kerala into the national Start-up ecosystem. Kerala Start-up history traces back to the creation of the Technopark in 1990 in Trivandrum, which was the largest IT park at the time. Technopark accommodates more than 400 IT firms with infrastructure, networking and business incubation services. This emphasis on entrepreneurship through technology at an early age provided a good atmosphere to Start-ups in the future. In 2011, Technopark introduced the Bio-Innovation Centre to promote Biotechnology Start-ups. The centre also offers state-of-the-art research laboratories, mentoring by specialists and infrastructure to foster innovation in healthcare, agriculture and environmental sustainability. In 2014, Kerala was the first Indian state to introduce a specific policy on Start-ups with the Kerala Technology Start-up Policy. The policy was to establish a friendly Start-up environment with tax breaks, funding and support infrastructure to focus on 2,500 crore investments. It promoted Start-ups in such industry domains as IT, healthcare, clean energy and biotechnology.

Start-up Policy 2018 added to this by creating sector-specific incentives, student entrepreneurship packages, further helping women-led Start-ups and innovation clusters. The most recent Start-up Policy 2021 intensified the ecosystem even more, with its focus on scale-up financing, research commercialisation, deep-tech and

climate-tech innovation, and international collaboration and the Kerala Start-up ecosystem is now more inclusive and future-oriented. Funding is one of the main aspects of the Kerala plan. Seed funding, prototype grants, matching grants, scale-up financing, tax incentives and student-oriented packages are available to the Start-ups. Specialised programmes for women entrepreneurs guarantee gender innovation. Bank-linked credit facilities, credit guarantee schemes, venture capital partnerships and early-stage loans are part of the institutional finance and support Start-ups in overcoming financial barriers. The Kerala Start-up Investment Fund, which was opened in 2017, offers high-potential Start-ups in IT, health, biotechnology and clean energy sectors the equity capital to facilitate their growth tremendously. Incubation and infrastructure is vast. Kerala Start-up Mission operates state-owned incubators, Fab Labs, Maker Villages, Innovation and Entrepreneurship Development Centres, co-working and international accelerators. Fab Lab Kerala is a 3D printing and laser-cutting service that was founded in 2017 in Kochi and provides support to hardware Start-ups to physicalise their product ideas into reality solutions. Cochin Shipyard Innovation Hub is an initiative that was opened in 2021 to aid maritime technology Start-ups in shipbuilding, marine engineering and sustainable maritime solutions.

There are institutions such as Kerala Development and Innovation Strategic Council and Kerala state planning board, where strategic guidance is given and monitoring of performances that are related to the ecosystem. Higher educational establishments have significant roles to play since they connect the incubation programmes with academic research and developing entrepreneurial talent. Mentorship and the development of skills are ubiquitous. Some of the programmes encompass entrepreneurship bootcamps, hackathons, networking activities, mentor-mentee activities and university-based mentorship programmes. The Student Entrepreneurship Programme was developed in 2016 to enable students to realise their ideas into businesses through mentorship, seed funding and infrastructural support. Atal Innovation Mission was initiated in 2016 with the creation of Atal Incubation Centres, which were designed to assist Start-ups to overcome operational barriers by offering mentorship and funding as well as infrastructure.

Technopark Technology Business Incubator Trivandrum provides a network of physical and virtual incubation services such as office space, strategic mentorship and funding services to Start-ups. Kerala has been keen on sustainability and green business and it is encouraging Start-ups in the area of clean energy, environmental conservation and circular economy solutions. These initiatives grant and fund Start-ups that make sustainable solutions. Also, programmes like NASSCOM 10,000 Start-ups, Start-up Village and Bionest provide training, funding and networking that strengthen the development of Start-ups in the state.

The ecosystem in Kerala has carried quantifiable results. In the state, there are more than 1,500 DPIIT-identified Start-ups in a variety of industries such as IT, biotechnology, healthcare, renewable energy, advanced manufacturing, and climate-tec and these Start-ups have submitted a number of patents, created job opportunities and brought national and foreign investments to India, playing a role in the innovation sector in the state. In 2019, the Kerala Start-up Ecosystem Report was released, which evaluated the performance of investments and Start-ups, the challenges faced and recommendations that can be offered to promote the ecosystem. The state has managed to maintain the effectiveness and futuristic nature of its Start-up initiatives through regular updating and monitoring of the policies by institutions. The Start-up ecosystem in Kerala has been created through the evolution of strategic policies, the strong financial and infrastructural back-up, skill development programmes, the mentorship, the facilitation of credits and institutional control. Technopark and Bio-Innovation Centre were followed by Fab Labs, Cochin Shipyard Innovation Hub, student entrepreneurship programmes and sector-specific initiatives, with Kerala developing a holistic environment of technology-driven, student-led and women-led Start-ups. Such an integrated strategy has made Kerala a role model in the development of entrepreneurship and a major contributor to the national Start-up mission in India.

Table 4.5*Summary of Qualitative Analysis*

Sl. No.	Analytical Dimension	Key Findings
1	Evolution of Kerala's Start-up Policies	Kerala's Start-up policy evolution reflects a transition from IT-focused initiatives (2002–2010) to a holistic Start-up ecosystem (post-2014). The 2014 and 2018 policies institutionalized innovation, incubation and funding mechanisms
2	Timeline of Policy Evolution and Ecosystem Development	The ecosystem expanded through milestones such as the establishment of KSUM (2012), policy revisions (2018, 2021) and integration with national frameworks, marking progressive strengthening of institutional infrastructure.
3	Establishment and Role of Kerala Start-up Mission (KSUM)	KSUM serves as the nodal agency facilitating Start-up incubation, funding, mentorship and collaboration. It acts as a single-window interface between entrepreneurs and government agencies.
4	Kerala's Dynamic Start-up Ecosystem: Partnerships Driving Innovation and Growth	Partnerships with global entities (e.g., IBM, Intel, UNDP) and national institutions (e.g., NITI Aayog, DPIIT) have enhanced knowledge transfer, innovation, and market linkages.
5	Integration with DPIIT and National Start-up Initiatives	Kerala aligns with the Start-up India framework, ensuring policy coherence and enabling Start-ups to access central government benefits such as tax exemptions and seed funds.
6	Financial Support Schemes	Financial interventions include the Seed Fund Scheme, Innovation Grant Scheme and Scale-up Support, providing early-stage funding, prototype development support and working capital assistance.
7	Incubation and Infrastructure Support	The state has developed over 60+ incubators, 200+ innovation and entrepreneurship development centres (IEDCs) and Maker Villages offering physical and digital incubation support.
8	Access to Credit and Institutional Finance	Collaborations with KSIDC, KFC and NABARD have enhanced access to credit. Dedicated funds like the Kerala Innovation Fund aim to de-risk early-stage ventures.

Sl. No.	Analytical Dimension	Key Findings
9	Skill Development and Mentorship Initiatives	Programmes like Young Innovators Programme (YIP), IEDC, and Fab Labs strengthen entrepreneurial and technical competencies through training, bootcamps and mentorship.
10	Start-up Performance Outcomes	Kerala has over 15,000 registered Start-ups, several incubators, and 1 lakh+ jobs created. Several Start-ups have scaled nationally and internationally, showcasing ecosystem maturity.
11	Kerala's Contribution and Future Roadmap	Kerala contributes significantly to India's Start-up landscape through policy innovation, inclusivity and sustainability. The roadmap focuses on deep-tech, rural innovation and global expansion.

4.16 PART II: ANALYSIS OF THE CHOICE OF SELECTING FUNDING STRATEGIES IN START-UPS

The choice of selecting funding strategies of Start-up entrepreneurs has been classified into six categories. This classification underscores the progression from the selection of own funds to the use of different combination of funding sources. It provides a structured framework for systematic analysis of the factors influencing entrepreneurs' funding decisions.

- (i) own funds
- (ii) own funds combined with debt financing
- (iii) own funds, debt and venture capital
- (iv) own funds, debt, venture capital and angel funding
- (v) own funds, debt, venture capital and crowdfunding
- (vi) own funds, debt, angel funding and crowdfunding.

4.16.1 Statistical Analysis of the Choice of Selecting Funding Strategies among Start-up Entrepreneurs

The following analytical tools were used for analysis.

- Mean and Standard Deviation
- Pearson Correlation Coefficient
- Multinomial Logit Model (MLM)
- Odds Ratio

For analysing the funding strategy selection among Start-up entrepreneurs, a combination of descriptive and inferential statistical techniques was used to ensure clarity and analytical depth. The mean and standard deviation were employed to summarise and describe the central tendency and dispersion of responses, providing insights into the general patterns and variability in funding choices across different Start-ups. To examine the relationships between key variables influencing funding decisions, such as entrepreneurial background, firm characteristics and institutional support, the Pearson correlation coefficient was applied, identifying the strength and direction of associations among these factors. Furthermore, to model and predict the likelihood of entrepreneurs choosing specific funding options such as venture capital, bank loans, government grants, or self-financing, the Multinomial Logit Model (MLM) was employed. This model enabled the assessment of how multiple independent variables simultaneously influence categorical funding decisions, offering a nuanced understanding of the determinants shaping Start-up financing behaviour in Kerala. The Odds Ratio derived from the MLM provided insights into the relative likelihood of selecting one funding strategy over another, offering a nuanced understanding of entrepreneurial decision-making. The following are the Multinomial Logit Model methodology for the study.

4.16.1.1 Multinomial Logit Model (MLM)

To assess the factors determining the choice of selecting funding strategies multinomial logit model has been used in the present study. To see how the model works, let

$Y_{ij} = 1$, if the individual i chooses alternative j

$= 0$, otherwise

Further let,

$$\pi_{ij} = P_r(Y_{ij} = 1)$$

Where P_r stands for probability

Therefore $\pi_{i1}, \pi_{i2}, \dots, \pi_{ij}$ Represent the probabilities that an individual i chooses alternative 1,2, ... j respectively obviously.

$$\pi_{i1}, \pi_{i2}, \dots, \pi_{ij} = 1 \quad \text{..... (1)}$$

We will call the π_s the response probabilities to estimate the π_s We use a multinational logit model given as

$$\pi_{ij} = \frac{e^{\alpha_j + \beta_j X_i}}{\sum_j e^{\alpha_j + \beta_j X_i}} \quad \text{..... (2)}$$

Since we cannot estimate all three probabilities independently, the common practice in MLM is to choose one category or choice as the base, reference or comparison category and set its coefficient values to zero. If we choose the first category and set $\alpha_1 = 0$ and $\beta_1 = 0$, We obtain the following intimation of the probabilities for j choices

$$\pi_{i1} = \frac{1}{1 + e^{\alpha_2 + \beta_2 X_i} + e^{\alpha_3 + \beta_3 X_i}} \quad \text{..... (3)}$$

$$\pi_{i2} = \frac{e^{\alpha_2 + \beta_2 X_i}}{1 + e^{\alpha_2 + \beta_2 X_i} + e^{\alpha_3 + \beta_3 X_i}} \quad \text{..... (4)}$$

$$\begin{matrix} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{matrix}$$

$$\pi_{ij} = \frac{e^{\alpha_j + \beta_j X_i}}{1 + e^{\alpha_2 + \beta_2 X_i} + e^{\alpha_3 + \beta_3 X_i}} \quad \dots (5)$$

The probability expressions in (3), (4) and (5) are highly nonlinear, but now consider the following expression.

$$L_n \left(\frac{\pi_{i2}}{\pi_{i1}} \right) = \alpha_2 + \beta_2 X_i \quad \dots (7)$$

$$L_n \left(\frac{\pi_{i3}}{\pi_{i1}} \right) = \alpha_3 + \beta_3 X_i \quad \dots (8)$$

$$\begin{matrix} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{matrix}$$

$$L_n \left(\frac{\pi_{ij}}{\pi_{i1}} \right) = \alpha_j + \beta_j X_i \quad \dots (9)$$

$$\pi_{i1} = 1 - \pi_{i2} - \pi_{i3} \dots \pi_{ij} \quad \dots (10)$$

Now the logits are linear functions of various explanatory variables. Logits are simple the logs of the Odds Ratio. And the odds tell by how much the alternative. j is preferred over the alternative l . The model is estimated by using the method of maximum likelihood. The coefficients are interpreted in relation to the reference category, as clear from (7), (8) and (9).

4.16.1.2 Odds Ratio

The Multinomial Logit Model (MLM) estimation was done to estimate the determinants that affect the decision to choose funding strategies, Odds Ratios (ORs) were calculated to enable the intuitive interpretation of the model coefficients. As the MLM coefficients are log-odds relative to the reference category, the exponentiation of the coefficients obtained Odds Ratios, which provide the relative probability of choosing a certain funding strategy over the base category. Own Funding was identified as the reference category, representing the least complex form of financing and its coefficient values were normalised to zero. When Odds Ratio is more than one an increase in the explanatory variable increases the chance of selecting a particular funding strategy over own funding. An Odds Ratio below one indicates a reduced

likelihood. The given methodology allowed gaining a more precise evaluation of how the specified factors impact the progression of entrepreneurs in terms of their own funds, to more diversified approaches to funding strategies in various stages of the business.

The key factors influencing the selection of these funding strategies were identified as:

- Awareness and knowledge of available funding options
- Financial considerations and the cost of capital
- Risk tolerance and control over business operations
- Accessibility and availability of funding sources
- Impact on business growth and sustainability
- External influences and strategic considerations.

In addition to these explanatory variables, there were the dummy variables that were included in order to reflect two qualitative variables, the stages of Start-up growth and the level of experience of the entrepreneurs. The stages of growth have been classified into early stage, growth stage and established stage. The growth and established stages were represented by dummy variables, where the early stage was the reference category. The experience of the entrepreneurs was categorised into two: first-time and experienced. Experience was also expressed using the dummy variables, whereby the first time was used as the reference group. These variables were added to test the hypothesis that the business stage and the previous entrepreneurial experience significantly influence the choice of selecting the funding strategies.

For analysis purpose, the choice of funding strategies are categorised into six groups namely Group(1): Own fund, Group (2): Own + Debt Fund, Group(3): Own + Debt + Venture Capital, Group(4): Own + Debt + Venture Capital + Angel Fund, Group(5): Own + Debt + Venture Capital + Crowd Fund, Group (6): Own + Debt + Angel + Crowd Fund. These groups represent more complexity of funding and diversification.

A Multinomial Logit Model (MLM) was used to test the determinants that affect the decision to select funding strategies, as the dependent variable will consist of more than two unordered categorical outcomes. During the modelling, Group 1 (Own Funds) was chosen as the reference group, since it is the simplest and least complicated funding source that usually used at the initial stages of the entrepreneurship venture. The values of the coefficients of the reference category were hence normalised to zero such that the relative effects of the explanatory variables could be meaningfully compared with each other in terms of their effects on the probability of selecting alternative funding strategies as opposed to relying solely on own funds.

Estimated coefficients of Groups 2 to 6 are therefore the log-odds of choosing each of the funding strategies, relative to the reference category. When the value of the coefficients is positive, it means that there is a higher likelihood of selecting a certain combination of funding over own funds, whereas when the coefficients are negative, there is a lower likelihood of selecting a funding combination. The summary of the variable is presented below.

Table 4.6

Summary of the choice of selecting funding strategies in Start-ups.

Sl. No.	Variables	Mean	Standard Deviation	Minimum	Maximum
1	Awareness and knowledge	11.44	3.54	5	20
2	Financial considerations and the cost of capital	15.65	3.71	5	20
3	Risk tolerance and control over business operations	11.36	3.38	5	20
4	Accessibility and availability of funding sources	10.94	3.11	5	20
5	Impact on business growth and sustainability	11.10	3.34	5	20
6	External influences and strategic considerations	11.35	3.17	5	20

Source: Primary Data

4.16.1.3 Interpretation

In table 4.6, mean scores indicate the relative importance placed by entrepreneurs on each dimension, with values ranging between 10.94 and 15.65 out of a maximum possible score of 20. Financial considerations and the cost of capital registered the highest mean value of 15.65 (SD = 3.71), suggesting that financial aspects such as interest rates, repayment burden and the overall cost of acquiring funds are the most critical determinants in funding decisions. This underscores the highly pragmatic approach of entrepreneurs in Kerala, who prioritise cost-efficiency and financial sustainability while choosing funding strategy in Start-ups.

The factors such as awareness and knowledge of funding options (M = 11.44, SD = 3.54) and Risk tolerance and control over business operations (M = 11.36, SD = 3.38) stands next in the order of importance. This indicates that entrepreneurs value both their familiarity with available funding avenues and their capacity to manage the risks associated with external financing. The factors with moderate scores such as External influences and strategic considerations (M = 11.35, SD = 3.17) and Impact on business growth and sustainability suggest that these aspects are relevant but they are secondary to direct financial considerations. Entrepreneurs thus recognise the role of market trends, investor expectations, and long-term growth opportunities in shaping funding choices, though these are not the primary determinants compared to financial cost.

The lowest mean score is observed for “Accessibility and availability of funding sources” (M = 10.94, SD = 3.11). Although accessibility is a significant structural barrier to financing, the result suggests that once entrepreneurs are aware of these options they may be more concerned with financial feasibility rather than mere availability of funds. The relatively consistent standard deviations (ranging from 3.11 to 3.71) indicate moderate variability in responses across all dimensions. This suggests that while individual perceptions vary, there is an overall consensus among entrepreneurs that cost-related considerations dominate funding decisions.

The overall findings reveal that Start-up entrepreneurs in Kerala adopt a cost-conscious and risk-aware approach to funding. Even though external influences,

growth prospects and accessibility play their roles, the financial viability of the funding source remains the overriding determinant while choosing the funding strategy of Start-ups in Kerala.

Table 4.7

Pearson Correlation of Variables

Sl. No.	Variables	Choice	Awareness and knowledge	Financial considerations and the cost of capital	Risk tolerance and control over business operations	Accessibility and availability of funding sources	Impact on business growth and sustainability	External influences and strategic considerations
1	Choice	1.00						
2	Awareness and knowledge	.58	1.00					
3	Financial considerations and the cost of capital	-.72	-.54	1.00				
4	Risk tolerance and control over business operation	.63	.48	-.52	1.00			
5	Accessibility and availability of funding sources	.33	.37	-.63	.38	1.0		
6	Impact on business growth and sustainability	.52	.28	-.43	.46	.45	1.0	
7	External influences and strategic considerations	.48	.19	-.35	.52	.47	.52	1.0

Source: Primary Data

4.16.1.4 Interpretation

The Pearson correlation coefficients presented in table 4.7 provide important insights into the interrelationships between the choice of funding strategies and the factors determining such as awareness, financial considerations, risk tolerance, accessibility, business growth and external influences. The results reveal both positive and negative associations. This indicates that funding preferences of entrepreneurs are shaped by a complex balance of enabling and constraining factors.

A strong positive correlation is observed between the choice of funding strategies and awareness and knowledge ($r = 0.58$), risk tolerance and control ($r = 0.63$), impact on business growth ($r = 0.52$) and external influences and strategic considerations ($r = 0.48$). These findings imply that the greater the awareness of funding options, the higher the risk-bearing capacity, the stronger perceived impact of funding on growth, and external strategic influences. All of these encourage entrepreneurs to adopt more diversified and sophisticated funding strategies. Awareness in particular acts as a critical driver in broadening the scope of funding options explored by Start-ups.

In contrast, financial considerations and cost of capital exhibit a strong negative correlation with choice ($r = -0.72$). This suggests that when the perceived cost of capital is high or financial burden is significant, entrepreneurs tend to avoid certain funding strategies and lean towards more conservative options. The negative correlation of financial considerations with awareness ($r = -0.54$), risk tolerance ($r = -0.52$), accessibility ($r = -0.63$) and growth ($r = -0.43$) further reinforces the notion that high costs act as a deterrent across multiple dimensions of funding decisions. The accessibility and availability of funding sources show a modest positive correlation with choice ($r = 0.33$) but a notable negative correlation with financial considerations ($r = -0.63$). This indicates that while ease of access improves the likelihood of adopting funding, its effect is often overshadowed when affordability concerns are high. Similarly, the positive associations between accessibility and risk tolerance ($r = 0.38$) and between accessibility and growth ($r = 0.45$) highlight that when funding is both accessible and growth-enhancing, entrepreneurs are more inclined to diversify their strategies.

The correlation analysis confirms that the selection of funding strategies is positively influenced by awareness, risk tolerance, accessibility and growth prospects, but negatively affected by high financial costs. The results emphasise that while entrepreneurs in Kerala are increasingly open to exploring multiple funding pathways, the affordability of finance remains a significant barrier to growth. Strengthening awareness campaigns, enhancing risk management support and reducing the cost of capital through policy interventions may therefore improve the financial ecosystem for Start-ups in the state. These results underline the cost-conscious, knowledge-driven and risk-sensitive orientation of Start-up entrepreneurs in Kerala.

4.16.1.5. Multinomial Logit Model of Choice of Funding Strategies

The multinomial logit regression equation was used to analyse the variables that influenced the decision to use which funding strategies among the Start-up entrepreneurs, own funds being taken as the reference category. The following hypotheses were used to test the decisions of choice of selecting funding strategies of Start-up entrepreneurs.

H₀: There is no significant relationship between the choice of selecting funding strategies and Awareness and knowledge of available funding options, Financial considerations and the cost of capital, Risk tolerance and control over business operations, Accessibility and availability of funding sources, Impact on business growth and sustainability and External influences and strategic considerations.

H₁: There is a significant relationship between the choice of selecting funding strategies and Awareness and knowledge of available funding options, Financial considerations and the cost of capital, Risk tolerance and control over business operations, Accessibility and availability of funding sources, Impact on business growth and sustainability and External influences and strategic considerations.

The findings are presented in the following table.

Table 4.8*Multinomial Logit Model of Choice of Funding Strategies*

Choices	Variables	Co-efficient	Standard Error	Z
2	Awareness and knowledge	0.8756	0.2214	3.95 (0.000)**
	Risk tolerance and control over business operations	0.1853	0.0263	7.0456 (0.000)**
	Accessibility and availability of funding sources	0.5251	0.2248	2.3358 (0.0097)**
	Impact on business growth and sustainability	0.1135	0.0348	3.2614 (0.0001)**
	External influences and strategic considerations	0.301	0.0348	8.6494 (0.000)**
	Financial considerations and the cost of capital	-0.309	0.1127	-2.74 (0.006)**
	Experience	0.16	0.0766	2.088 (0.0183)**
	Growth	0.0154	0.0776	1.976 (0.0489)**
	Established	0.0851	0.0148	5.75 (0.000)**
	Constant	-9.4388	3.1136	-3.03 (0.002)**
3	Awareness and knowledge	2.4038	0.4559	5.27 (0.000)**
	Risk tolerance and control over business operations	0.7825	0.3369	2.32 (0.020)**
	Accessibility and availability of funding sources	0.7201	0.3019	2.38 (0.008)**
	Impact on business growth and sustainability	0.664	0.3121	2.127 (0.0167)**
	External influences and strategic considerations	0.3617	0.1452	4.57 (0.000)**
	Financial considerations and the cost of capital	-0.4363	0.1225	-3.56 (0.000)**
	Experience	1.3613	0.4004	3.39 (0.0000)**
	Growth	0.14	0.0459	3.050 (0.00114)**
	Established	1.048	0.545	1.950 (0.050)**
	Constant	-38.3401	5.6339	-6.81 (0.0000)**

Choices	Variables	Co-efficient	Standard Error	Z
4	Awareness and knowledge	2.402	0.5821	4.13 (0.000)**
	Risk tolerance and control over business operations	0.9811	0.2237	4.385 (0.000)**
	Accessibility and availability of funding sources	0.9039	0.4077	2.217 (0.026)**
	Impact on business growth and sustainability	1.7232	0.6728	2.56 (0.010)**
	External influences and strategic considerations	0.6216	0.4004	2.450 (0.014)**
	Financial considerations and the cost of capital	-0.5167	0.2121	2.436 (0.014)**
	Experience	0.9813	0.4004	2.450 (0.014)**
	Growth	1.888	0.3399	5.545 (0.000)**
	Established	2.048	0.5005	4.091 (0.000)**
	Constant	-63.5911	11.107	-5.73 (0.000)**
5	Awareness and knowledge	2.7014	0.7731	3.49 (0.000)**
	Risk tolerance and control over business operations	0.1243	0.04179	2.634 (0.0084)**
	Accessibility and availability of funding sources	1.6944	0.7761	2.18 (0.029)**
	Impact on business growth and sustainability	2.0825	0.9387	2.22 (0.0264)**
	External influences and strategic considerations	1.4848	0.6641	2.234 (0.043)**
	Financial considerations and the cost of capital	-0.795	0.3245	-2.449 (0.043)**
	Experience	0.1732	0.0125	13.856 (0.000)**
	Growth	2.574	1.023	2.515 (0.0254)**
	Established	1.023	0.0994	10.291 (0.000)**
	Constant	-83.0441	17.3675	-4.78 (0.000)**

Choices	Variables	Co-efficient	Standard Error	Z
6	Awareness and knowledge	2.0881	0.967	2.16 (0.031)**
	Risk tolerance and control over business operations	0.2877	0.0589	4.884 (0.000)**
	Accessibility and availability of funding sources	0.245	0.1254	1.963 (0.05)**
	Impact on business growth and sustainability	2.7734	1.0889	2.55 (0.011)**
	External influences and strategic considerations	3.7942	1.3158	2.88 (0.004)**
	Financial considerations and the cost of capital	-1.0188	1.3158	2.88 (0.004)**
	Experience	1.2357	0.3256	3.795 (0.000)**
	Growth	4.8751	2.5	1.95 (0.05)**
	Established	6.5438	2.8901	2.264 (0.024)**
	Constant	-96.3746	21.45	-4.49 (0.000)**
$\chi^2=699.01 (0.000)^{**}$ Pseudo R ² =0.7600 Pseudo R ² =0.7600				

Source: Primary Data

Figures in brackets are P Values.

** shows significance at 5% level

4.16.1.6 Interpretation

The model results demonstrated in Table 4.8 indicate that the explanatory variables collectively exert a statistically significant influence on the choice of funding strategies, as indicated by the highly significant Likelihood Ratio Chi-square statistic ($\chi^2 = 699.01$, $p < 0.001$). The Pseudo R² value of 0.7600 suggests a strong model fit, indicating that 76% of the variance in funding choice is explained by the predictor variables.

Across all five alternative funding categories (Choices 2–6) such as awareness and knowledge, risk tolerance and control over business operations, accessibility and availability of funding sources, impact on business growth and sustainability, external

influences and strategic considerations, entrepreneurial experience, growth stage and establishment status are positive and statistically significant at the 5% level. For instance, awareness and knowledge significantly increase the likelihood of selecting more diversified funding combinations (Choice 3: $\beta = 2.4038$, $Z = 5.27$, $p = 0.000$; Choice 5: $\beta = 2.7014$, $Z = 3.49$, $p = 0.000$). Similarly, experience shows a strong positive influence in advanced combinations of external funding sources (Choice 3: $\beta = 1.3613$, $Z = 3.39$, $p = 0.000$; Choice 6: $\beta = 1.2357$, $Z = 3.795$, $p = 0.000$). This indicates that more experienced entrepreneurs are progressively inclined to choose multi-layered external funding mechanisms.

Conversely, financial considerations and cost of capital consistently exhibits negative coefficients across all choices, demonstrating that sensitivity to the cost of capital reduces the likelihood of opting for external sources relative to own funds (Choice 2: $\beta = -0.309$, $Z = -2.74$, $p = 0.006$; Choice 5: $\beta = -0.795$, $Z = -2.449$, $p = 0.043$). This indicates that those entrepreneurs who are concerned about repayment obligations or higher funding costs prefer self-funding despite the availability of other options. Further, the magnitude of positive coefficients, particularly in Choices 5 and 6 for example, external influences (Choice 6: $\beta = 3.7942$, $Z = 2.88$, $p = 0.004$) and growth stage (Choice 6: $\beta = 4.8751$, $Z = 1.95$, $p = 0.05$) suggests that complex funding combinations are more likely to be chosen by entrepreneurs whose ventures have advanced growth prospects or greater external exposure. The significant constants across all categories (e.g., Choice 6: $\beta = -96.3746$, $Z = -4.49$, $p = 0.000$) indicate strong baseline differences between the choices when all predictors are held constant. Hence the alternative hypothesis, stating that there is a significant relationship between the choice of funding strategies and the factors that influence it, is accepted. Overall, the findings validate and confirm that funding decisions among Start-up entrepreneurs are systematically shaped by a set of financial, experiential and strategic factors rather than being random or uniform across categories.

The extent of the impact of each variable regarding the choice of funding strategies and the factors that influence it can be analysed based on the coefficient of each variable on different choice categories. To understand how the awareness and

knowledge of various funding options influence the choice of funding strategies of entrepreneurs, the coefficients for each choice category were analysed. A higher coefficient indicates a greater likelihood that increased awareness leads to the selection of that particular combination of funding sources. The results are summarised in Table 4.9.

Table 4.9

Awareness and Knowledge Levels Across Funding choices of funding Strategies

Group	Awareness and (coefficient)
2 (Own + Debt Fund)	0.8756
3 (Own + Debt + Venture Capital)	2.4038
4 (Own + Debt + Venture Capital + Angel Fund)	2.4020
5 (Own + Debt + Venture Capital + Crowd Fund)	2.7014
6 (Own + Debt + Angel + Crowd Fund)	2.0881

Source: Primary Data

4.16.1.7 Interpretation

In table 4.9, Group 5 (Own + Debt + Venture Capital + Crowd Fund) records the highest score (2.7014). This indicates that entrepreneurs opting for more diverse and complex funding sources demonstrate stronger awareness and knowledge of available financing mechanisms. This is likely because such strategies demand higher financial literacy and exposure to multiple channels. Similarly, Group 3 (Own + Debt + Venture Capital) and Group 4 (Own + Debt + Venture Capital + Angel Fund) also show relatively high values (2.4038 and 2.4020, respectively), suggesting that the involvement of equity-based investors such as venture capitalists and angels require entrepreneurs to be better informed about funding options and their implications. Group 6 (Own + Debt + Angel + Crowd Fund), with a moderate score (2.0881), reflects a fair level of awareness, possibly due to the mix of traditional and alternative funding sources. In contrast, Group 2 (Own + Debt Fund) has the lowest score (0.8756), implying that entrepreneurs relying primarily on simpler funding structures have comparatively limited knowledge and exposure to broader financing

opportunities. Overall, the results indicate that awareness and knowledge are higher among entrepreneurs pursuing diverse, multi-source financing strategies, while those depending on simpler models demonstrate relatively limited understanding. The analysis reveals that there is significant variation in awareness and knowledge of funding strategy options across different groups.

In order to examine the willingness of entrepreneurs to take risks and their preference for maintaining control that influence the selection of funding strategies, the study analysed the coefficient values for each choice of funding strategies. Higher coefficients indicate a stronger association between these behavioural factors and the likelihood of choosing specific funding combinations. The results are presented in Table 4.10.

Table 4.10

Risk Tolerance and Control Differences Across Funding Choices of Funding Strategies

Group	Risk tolerance and control over business operations (coefficient)
2 (Own + Debt Fund)	0.1853
3 (Own + Debt + Venture Capital)	0.7825
4 (Own + Debt + Venture Capital + Angel Fund)	0.9811
5 (Own + Debt + Venture Capital + Crowd Fund)	0.1243
6 (Own + Debt + Angel + Crowd Fund)	0.2877

Source: Primary Data

4.16.1.8 Interpretation

The table 4.10 indicates that risk tolerance and control over business operations reveal notable differences among the groups in their approach to funding strategies. Group 4 (Own + Debt + Venture Capital + Angel Fund) records the highest score (0.9811), suggesting that entrepreneurs who diversify into equity-based funding, especially through venture capital and angel investors, demonstrate greater risk tolerance and a stronger orientation toward balancing control with external involvement. Group 3

(Own + Debt + Venture Capital) follows closely with a value of 0.7825, reflecting a willingness to take calculated risks while managing investor expectations. In contrast, Group 2 (Own + Debt Fund) and Group 5 (Own + Debt + Venture Capital + Crowd Fund) show much lower values (0.1853 and 0.1243, respectively), indicating that these entrepreneurs prefer to minimise risks and retain more control over their businesses, possibly due to reliance on debt or wider, less predictable funding sources like crowd funding. Group 6 (Own + Debt + Angel + Crowd Fund) shows a moderate level (0.2877), suggesting some openness to risk but still lower than equity-heavy groups. Overall, the findings indicate that entrepreneurs integrating venture capital and angel funds exhibit higher risk tolerance, while those relying mainly on debt or crowdfunding prefer safer, more controlled approaches to financing.

The accessibility and availability of different funding sources play a significant role in shaping the funding choices of entrepreneurs. To understand this influence, the coefficient values across various combinations of funding strategy were analysed and the results are given in Table 4.11.

Table 4.11

Accessibility and Availability Differences across Choices of Funding Strategies

Group	Accessibility and availability of funding sources (Coefficients)
2 (Own + Debt Fund)	0.5251
3 (Own + Debt + Venture Capital)	0.7201
4 (Own + Debt + Venture Capital + Angel Fund)	0.9039
5 (Own + Debt + Venture Capital + Crowd Fund)	1.6944
6 (Own + Debt + Angel + Crowd Fund)	0.2450

Source: Primary Data

4.16.1.9 Interpretation

In table 4.11, Group 5 (1.6944) records the highest value. This indicates that entrepreneurs who adopt a broader mix of funding options (own, debt, venture capital, and crowdfunding) enjoy the widest access to diverse financing channels. This is

followed by Group 4 (0.9039) and Group 3 (0.7201), showing that those relying on venture capital and angel investors also benefit from relatively higher accessibility compared to conventional approaches. Group 2 (0.5251), which depends only on own and debt funds, shows limited access, while Group 6 (0.2450) reflects the lowest score, suggesting significant challenges in accessing funds when entrepreneurs combine own, debt, angel, and crowdfunding. The findings imply that diversified strategies involving venture capital and crowdfunding significantly improve accessibility, while over-reliance on niche or informal sources tends to restrict availability.

In order to understand the effect of different funding combinations on the long-term business growth and sustainability, the study evaluated the influence of each funding strategy choice using coefficient values. Higher coefficients indicate a stronger positive impact on growth prospects and overall sustainability. The results are presented in Table 4.12.

Table 4.12

Impact on Business Growth and Sustainability Across Choices of Funding Strategies

Group	Impact on business growth and sustainability(coefficient)
2 (Own + Debt Fund)	0.1135
3 (Own + Debt + Venture Capital)	0.6640
4 (Own + Debt + Venture Capital + Angel Fund)	1.7232
5 (Own + Debt + Venture Capital + Crowd Fund)	2.0825
6 (Own + Debt + Angel + Crowd Fund)	2.7734

Source: Primary Data

4.16.1.10 Interpretation

In table 4.12, Group 6 (Own + Debt + Angel + Crowd Fund) shows the highest value (2.7734). This indicates that entrepreneurs using a diversified mix of both formal and alternative funding sources perceive the strongest positive influence on long-term growth and sustainability. This is followed by Group 5 (Own + Debt + Venture Capital

+ Crowd Fund) with 2.0825 and Group 4 (Own + Debt + Venture Capital + Angel Fund) with 1.7232, suggesting that the inclusion of venture capital and crowd-based finance significantly strengthens the growth prospects. Group 3 (Own + Debt + Venture Capital) has a moderate effect (0.6640), while Group 2 (Own + Debt Fund) records the lowest score (0.1135), reflecting limited impact on scaling and sustainability when relying only on traditional funding. The findings indicate that greater diversification of funding sources, especially through venture capital, angel investment, and crowdfunding, enhances the ability of Start-ups to achieve sustainable business growth.

External factors such as market conditions, regulatory requirements, investor expectations and competitive pressures can significantly influence the funding decision of entrepreneurs. To assess the extent of this influence, coefficient values were analysed across different funding strategy choices. Higher values indicate a stronger impact of external and strategic considerations on the selection of specific funding combinations. The results are shown in Table 4.13.

Table 4.13

External Influences and Strategic Considerations across Choices of Funding Strategies

Group	External influences and strategic considerations (coefficient)
2 (Own + Debt Fund)	.3010
3 (Own + Debt + Venture Capital)	.3617
4 (Own + Debt + Venture Capital + Angel Fund)	.6216
5 (Own + Debt + Venture Capital + Crowd Fund)	1.4848
6 (Own + Debt + Angel + Crowd Fund)	3.7942

Source: Primary Data

4.16.1.11 Interpretation

In table 4.13, Group 6 (Own + Debt + Angel + Crowd Fund) records the highest score (3.7942). This highlights that those entrepreneurs who rely on a wider mix of funding

sources are more strongly influenced by external factors such as investor expectations, industry trends, and market dynamics. This is followed by Group 5 (Own + Debt + Venture Capital + Crowd Fund) with 1.4848, and Group 4 (Own + Debt + Venture Capital + Angel Fund) with 0.6216. This indicates that when Start-ups engage in more sophisticated funding options like venture capital and angel investors, the external pressures and strategic considerations increasingly shape their choices. Groups 2 (Own + Debt Fund) and 3 (Own + Debt + Venture Capital) show relatively low scores (0.3010 and 0.3617, respectively), indicating minimal external influence when funding strategies remain limited to conventional or fewer sources. The results imply that the complexity and diversity of funding strategies expose Start-ups to greater external expectations and strategic pressures, which significantly influence their funding decisions.

Financial considerations, particularly the cost of capital associated with different funding sources, play a crucial role in shaping the funding choices entrepreneurs. To measure the influence of cost-related factors on the selection of funding combinations, coefficient values were analysed across various groups. More negative values indicate a stronger cost-related deterrent in opting a particular funding strategy. The results are presented in Table 4.14.

Table 4.14

Financial Considerations and Cost of Capital across Choices of Funding Strategies

Group	Financial considerations and the cost of capital(coefficient)
2 (Own + Debt Fund)	-.3090
3 (Own + Debt + Venture Capital)	-.4363
4 (Own + Debt + Venture Capital + Angel Fund)	-.5167
5 (Own + Debt + Venture Capital + Crowd Fund)	-.7950
6 (Own + Debt + Angel + Crowd Fund)	-1.0188

Source: Primary Data

4.16.1.12 Interpretation

The results given in table 4.14 is a clear indication that the odds of selecting funding strategies beyond own funds decrease as financial costs are taken into account. Specifically, the decline is gradual in the case of Group 2 (Own + Debt Fund) at -0.3090, Group 3 (Own + Debt + Venture Capital) at -0.4363, and Group 4 (Own + Debt + Venture Capital + Angel Fund) at -0.5167. The reduction is sharper in Group 5 (Own + Debt + Venture Capital + Crowd Fund) with -0.7950, and most pronounced in Group 6 (Own + Debt + Angel + Crowd Fund) with -1.0188. On the whole, the results for financial considerations and the cost of capital show consistently negative coefficients across groups when compared to the reference category (Group 1 – Own Fund).

This trend clearly suggests that entrepreneurs perceive their own funds as the most financially viable option, while the relative attractiveness of external and more complex funding strategies diminishes due to higher costs of capital, repayment obligations, and perceived financial risks. Thus, cost considerations act as a deterrent in moving away from reliance on own funds toward more diversified funding sources. The more diversified the funding portfolio, the less decisive the cost of capital in shaping funding choices. This reflects a shift from cost-conscious decision-making to growth and opportunity-oriented strategies.

4.16.1.13 Odds Ratio

For the ease of comparing the magnitude of the effect of independent variables, the relative risk ratio or Odds Ratio has been computed. The results are furnished in Table 4.15.

Table 4.15

Odds Ratio of comparing the magnitude of the choice of selecting funding strategies in Start-ups

Group	Variable	Relative Risk ratio (Odds Ratio)	Z
2	Awareness and knowledge	2.4004	3.95 (0.000)**
	Risk tolerance and control over business operations	1.2037	7.0456 (0.000)**
	Accessibility and availability of funding sources	1.6907	2.3358 (0.0097)**
	Impact on business growth and sustainability	1.1202	3.2614 (0.0001)**
	External influences and strategic considerations	1.3513	8.6494 (0.000)**
	Financial considerations and the cost of capital	0.7341	-2.74 (0.006)**
	Experience	1.1735	2.088 (0.0183)**
	Growth	1.0155	1.976 (0.0489)**
	Established	1.0889	5.75 (0.000)**
3	Awareness and knowledge	11.0652	5.27 (0.000)**
	Risk tolerance and control over business operations	2.187	2.32 (0.020)**
	Accessibility and availability of funding sources	2.0547	2.38 (0.008)**
	Impact on business growth and sustainability	1.9426	2.127 (0.0167)**
	External influences and strategic considerations	1.4357	4.57 (0.000)**
	Financial considerations and the cost of capital	0.6463	-3.56 (0.000)**
	Experience	3.9012	3.39 (0.0000)**
	Growth	1.1502	3.050 (0.00114)**
	Established	1.4351	1.950 (0.050)**

Group	Variable	Relative Risk ratio (Odds Ratio)	Z
4	Awareness and knowledge	11.0459	4.13 (0.000)**
	Risk tolerance and control over business operations	2.6674	4.385 (0.000)**
	Accessibility and availability of funding sources	2.4694	2.217 (0.026)**
	Impact on business growth and sustainability	5.6028	2.56 (0.010)**
	External influences and strategic considerations	1.862	2.450 (0.014)**
	Financial considerations and the cost of capital	0.5964	2.436 (0.014)**
	Experience	2.66	2.450 (0.014)**
	Growth	6.6119	5.545 (0.000)**
	Established	7.7588	4.091 (0.000)**
5	Awareness and knowledge	14.9008	3.49 (0.000)**
	Risk tolerance and control over business operations	1.1323	2.634 (0.0084)**
	Accessibility and availability of funding sources	5.4437	2.18 (0.029)**
	Impact on business growth and sustainability	8.0252	2.22 (0.0264)**
	External influences and strategic considerations	4.4144	2.234 (0.043)**
	Financial considerations and the cost of capital	0.4515	-2.449 (0.043)**
	Experience	1.891	13.856 (0.000)**
	Growth	13.1201	2.515 (0.0254)**
	Established	2.7839	10.291 (0.000)**
6	Awareness and knowledge	8.0699	2.16 (0.031)**
	Risk tolerance and control over business operations	1.3333	4.884 (0.000)**
	Accessibility and availability of funding sources	1.2776	1.963 (0.05)**
	Impact on business growth and sustainability	16.0137	2.55 (0.011)**

Group	Variable	Relative Risk ratio (Odds Ratio)	Z
	External influences and strategic considerations	44.444	2.88 (0.004)**
	Financial considerations and the cost of capital	0.361	2.88 (0.004)*
	Experience	1.2357	3.795 (0.000)**
	Growth	130.9921	1.95 (0.05)**
	Established	694.9386	2.264 (0.024)**

Source: Primary Data

Figures in brackets are p-values

** shows significance at 5% level

4.16.1.14 Interpretation

The information given in table 4.15 highlights the relative influence of different independent variables on the choice of funding strategies in Start-ups across the six groups. The findings reveal notable differences in the strength and significance of factors that influence funding preferences of entrepreneurs.

For Group 2 (Own + Debt), awareness and knowledge (OR = 2.4004), risk tolerance (OR = 1.2037), accessibility of funding (OR = 1.6907) and external influences (OR = 1.3513) significantly increase the odds of selecting funding options. This suggests that entrepreneurs at this stage rely primarily on personal understanding and risk-handling abilities. Interestingly, financial considerations show a negative influence (OR = 0.7341, $p < 0.01$), implying that debt involvement, cost factors are not the prime determinants of choice.

In Group 3 (Own + Debt + Angel), awareness and knowledge exhibit a strong positive effect (OR = 11.0652). This indicates that better-informed entrepreneurs are much more likely to diversify funding. Experience (OR = 3.9012) also emerges as a critical determinant, while financial considerations also reduce the odds (OR = 0.6463). Similar patterns appear in Group 4 (Own + Debt + Angel + Venture Capital), where the awareness (OR = 11.0459), growth potential (OR = 6.6119), and establishment

status (OR = 7.7588) become dominant drivers, reflecting the growing importance of credibility and scalability for securing institutional funds.

Regarding Group 5 (Own + Debt + Angel + Venture + Crowd Funding), awareness and knowledge (OR = 14.9008), impact on growth (OR = 8.0252), and accessibility (OR = 5.4437) significantly shape funding choice. This shows that entrepreneurs at this stage prioritise expansion, visibility, and external validation. External influences (OR = 4.4144) also strongly drive the selection, underlining the role of networks and strategic positioning. However, the cost of capital continues to influence decisions negatively (OR = 0.4515).

In Group 6 (Highly diversified funding Own + Debt + Angel + Venture + Crowd + Others), the odds ratio reveals a dramatic shift. External influences and strategic considerations (OR = 44.444) and growth potential (OR = 130.9921) emerge as overwhelmingly dominant factors, alongside establishment status (OR = 694.9386). This indicates that once Start-ups enter advanced funding stages, their ability to secure resources becomes less in the case of financial cost and more on strategic visibility, growth scalability, and legitimacy in the ecosystem. Financial considerations become nearly irrelevant (OR = 0.361, non-significant). This reaffirms that entrepreneurs pursuing highly diversified funding portfolios prioritise expansion over cost-efficiency.

The odds ratio results clearly suggest a transition from cost-conscious decision-making in early funding (Group 2) to growth, external validation and ecosystem-driven decision-making in advanced funding stages (Groups 5 and 6). The findings emphasise that as Start-ups evolve, their funding choices are increasingly shaped by knowledge, credibility, growth potential, and external influences. While, the cost of capital loses its importance progressively.

4.16.1.15 Summary of Analysis of choice of selecting funding strategies among Start-ups in Kerala

The analysis of the choice of selecting funding strategies among Start-ups in Kerala reveals that entrepreneurs exhibit a distinctly cost-conscious, knowledge-driven and

growth-oriented approach when determining their financing preferences. The descriptive statistics show that financial considerations and the cost of capital are the most influential determinants, with entrepreneurs prioritising affordability, repayment feasibility and long-term financial sustainability. Factors such as awareness and knowledge of funding options, risk tolerance, accessibility of funds and strategic influences also play crucial roles, though to varying degrees.

The Pearson correlation analysis indicates that awareness, risk tolerance, accessibility, business growth potential and external strategic factors are all positively correlated with the choice of funding strategies, suggesting that better-informed and risk-tolerant entrepreneurs are more likely to adopt diversified funding sources. Conversely, financial considerations show a strong negative correlation, reaffirming that high costs discourage broader funding diversification.

The Multinomial Logit Model (MLM) further confirms that all explanatory variables significantly influence the probability of selecting specific funding strategies, with a robust model fit (Pseudo $R^2 = 0.76$) and a highly significant Chi-square value ($\chi^2 = 699.01$, $p < 0.001$). Awareness, risk tolerance, accessibility and business growth exert positive effects across most funding categories, while financial considerations consistently show a negative relationship, indicating that cost remains a deterrent in opting for complex funding mixes.

The odds ratio analysis demonstrates a clear progression across funding stages. In early stages (Own + Debt), decision-making is driven primarily by awareness and risk tolerance, while in advanced stages (involving venture capital, angel and crowdfunding), factors such as growth potential, external influences and entrepreneurial experience dominate. Notably, in highly diversified funding portfolios, financial cost becomes statistically insignificant and decisions are instead shaped by growth ambitions, strategic visibility and credibility within the ecosystem.

The findings reveal that the strategic evolution in entrepreneurial financing behaviour from conservative, cost-sensitive funding choices at the early stages to growth-driven, ecosystem-integrated financing approaches in later stages. This transition underscores the importance of enhancing financial literacy, improving funding accessibility and

creating supportive institutional frameworks that reduce cost barriers and empower Start-ups to pursue sustainable, diversified growth in the entrepreneurial landscape of Kerala.

4.17 PART III: THE LEVEL OF SATISFACTION OF ENTREPRENEURS TOWARDS START-UP FINANCE

To assess the satisfaction of entrepreneurs about Start-up finance, an Ordered Multinomial Logit model has been used in the present study. The dependent variable, satisfaction of entrepreneurs towards Start-ups' finance, has been measured on a five-point Likert scale. The independent variables were constructed by aggregating responses measured on a five-point Likert scale. Each variable, such as :

- Variability of funding options
- Ease of access to finance
- Cost and affordability of funding
- Government policy and support
- The impact of funding on business growth

Based on the above mentioned variables, the following hypotheses were constructed for testing the result.

Ho: The satisfaction of entrepreneurs towards Start-up finance is not significantly related to the variability of funding options, ease of access to finance, cost and affordability of funding, government policy and support and impact of funding on business growth.

H₁: The satisfaction of entrepreneurs towards Start-up finance is significantly related to the variability of funding options, ease of access to finance, cost and affordability of funding, government policy and support and impact of funding on business growth.

4.17.1 Statistical Analysis of the Level of Satisfaction of Entrepreneurs towards Start-up Finance

The following analytical tools were used for analysis:

- Mean and Standard Deviation
- Pearson Correlation Coefficient
- Ordered Multinomial Logit Model (OMLM)
- Odds Ratio

In order to measure the level of satisfaction of entrepreneurs towards Start-up finance, the study utilises a combination of descriptive and inferential statistical methods to ensure a comprehensive and objective analysis. The mean and standard deviation were first computed to summarise the overall satisfaction levels and to assess the consistency of responses across various dimensions such as adequacy, accessibility and timeliness of financial support. To examine the relationships among the variables that influence the level of satisfaction, the Pearson correlation coefficient was applied. This helps to identify the strength and direction of associations between financial factors and the level of satisfaction of entrepreneurs. Further, to model the determinants of satisfaction across ordered categories from low to high satisfaction, the study employed an Ordered Multinomial Logit Model (OMLM). This model provides the effect of independent variables on level of satisfaction of entrepreneurs towards Start-up finance.

The odds ratios calculated from the model reveal the approximate probability of the entrepreneurs falling into the higher categories of satisfaction as a result of particular influencing factors. All these statistical techniques allowed a strict evaluation of the patterns of satisfaction and allowed a better understanding of the effect of financial mechanisms and institutional structures on Start-up entrepreneurs in Kerala. The Ordered Multinomial Logit Model and Odds Ratio methodology used for the study are explained below.

4.17.1.1 Ordered Multinomial Logit Model (OMLM)

To assess the level of satisfaction of entrepreneurs towards Start-up finance, an ordered Multinomial Logit Model is used. The Ordered Logit Model is estimated by using the method of maximum likelihood (ML). To understand the mechanism involving the ordered multinomial logit model, consider the example.

$$Y_i^* = \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_k X_{ik} + u_i \quad \text{..... (1)}$$

$$= \sum_{n=1}^k \beta_n X_{in} + u_i$$

Where Y_i^* is observed, the X 's are the regressors and u_i is the error term. Further assume that we have n independent observations and they face J - ordered alternatives, such that

$$\begin{aligned} Y_i &= 1, \text{ if } Y_i^* \leq a_1 \\ Y_i &= 2, \text{ if } a_1 < Y_i^* \leq a_2 \\ Y_i &= 3, \text{ if } a_2 < Y_i^* \leq a_3 \\ &\vdots \quad \quad \quad \vdots \quad \quad \quad \vdots \\ &\vdots \quad \quad \quad \vdots \quad \quad \quad \vdots \\ &\vdots \quad \quad \quad \vdots \quad \quad \quad \vdots \\ Y_i &= J, \text{ if } a_{J-1} \leq Y_i^* \end{aligned} \quad \text{..... (2)}$$

Where $a_1 < a_2 < a_3 \dots < a_{J-1}$. That is, we observe an individual Y_i in one of the J ordered categories, these categories being separated by the threshold parameters or cutoffs, the a 's. Y_i^* is often known as a latent or index variable.

The ordered multinomial logit model estimates not only the coefficients of the X regressors but also the threshold parameters. In the model, the slope coefficients of the X regressors are the same in each category; it is only their intercepts (cutoffs) that differ. In other words, we have parallel regression lines, but they are anchored on different intercepts. That is why OLM is also known as the proportional odds model.

To understand the method of estimation of the ordered multinomial logit model using the method of maximum likelihood consider the following:

$$P_r(Y_i \leq j) = P_r(\beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + u_i \leq a_j) \quad \dots (3)$$

$$= P_r(u_i \leq a_j - \beta_1 X_{1i} - \beta_2 X_{2i} - \dots - \beta_k X_{ki})$$

That is, equation (3) gives the (cumulative) probability that Y_i falls in a category J and below (i.e. in category 1,2,...,j)

Models for ordered responses use cumulative probabilities as shown in equation (3). To compute such probabilities we use

$$\frac{\exp(a_j - \beta_x)}{1 + \exp(a_j - \beta_x)} \quad \dots (4)$$

Which is the Cumulative Distribution Function? Note that β_x stands for $\sum_1^k \beta_k X_k$. It is clear from equation (4) that the effect of a regressor on the dependent variable is nonlinear. So the interpretation of the coefficients is complicated. To make the interpretation easier, we use the odds ratio since the outcomes on the left-hand side of equation (2) reflect the ordering of the response scale; it is customary to consider the odds ratio defined by

$$\frac{P_r[Y_i \leq j/X]}{P_r[Y_i > j/X]} = \frac{P_r[Y_i \leq j/X]}{P_r[1 - P_r(Y_i \leq j/X)]} \quad \dots (5)$$

Where $P_r[Y_i \leq j/X] = \sum_{m=1}^j p_r[Y_i = m/X]$ (6)

Which denotes the cumulative probability that the outcome is less than or equal to j

Now, if we use the logistic CDF(Cumulative Distribution Function) given in equation (4) to compute the odds ratio in equation (5) and take the log of this odds ratio (ie, logit), we obtain:

$$\text{logit} [P_r(Y_i \leq j)] = \ln \frac{P_r(Y_i \leq j)}{P_r(Y_i > j)} \quad \dots (7)$$

$$= \ln \frac{P_r(y_i \leq j)}{[1 - P_r(y_i \leq j)]}$$

$$= a_j - \sum_{n=1}^k \beta_n X_{in} \quad j = 1, 2, \dots, (j-1)$$

Equation (7) gives a sequence of logits (or log odds) which all have the same regressors and the same slope coefficients but different intercepts. All regressors have the same impact on the (ordered) dependent variable given by their β coefficients and the classification into ordered categories depends on the cutoff or intercept coefficient a_j .

4.17.1.2 Odds Ratio

The Odds Ratio is an important measure that is used to explain the relationship between explanatory variables and the probability of an outcome in the Ordered Multinomial Logit Model. It is a measure of relative likelihood of an observation to fall into a specific category (or less than a specific threshold) relative to falling above it, other factors held constant in the model. In particular, Odds Ratio is a measure of the degree to which a one-unit change in an independent variable would lead to a change in the odds of being in a lower category versus a higher category of responses. The Odds Ratio can be calculated mathematically by exponentiating the estimated regression coefficients. An Odds Ratio above one describes an increment of the predictor to a higher ordered category, and an Odds Ratio below one describes the reverse. The coefficients become more meaningful in this transformation since it transforms the log-odds into a direct multiplicative effect on the odds. Using Odds Ratios, the analysis gives a better picture of the strength and direction of the relationship between the determinants of funding strategies and the level of satisfaction of the entrepreneurs with Start-up finance.

Table 4.16*Summary statistics of satisfaction of entrepreneurs and its determinants*

Sl. No.	Variables	Mean	Standard Deviation	Minimum	Maximum
1	Satisfaction of Entrepreneurs	3.05	1.14	1	5
2	Availability of funding options	15.85	4.34	6	25
3	Ease of access to finance	15.46	4.36	8	25
4	Cost and affordability of funding	15.21	4.21	6	25
5	Government policy and support	14.36	3.52	5	25
6	Impact of funding on business growth	13.82	3.50	5	25

Source: Primary data

4.17.1.3 Interpretation

The table No.4.16 indicates that, mean satisfaction score of 3.05 (SD = 1.14) on average, entrepreneurs in the sample were moderately satisfied with the Start-up financing they had received. The standard deviation suggests considerable variation in satisfaction levels across respondents, implying that while some entrepreneurs expressed high satisfaction, others reported low levels of satisfaction. The minimum score of 1 confirms the presence of respondents who were very dissatisfied with Start-up financing.

Among the independent variables, Variable 1 (variability of funding options) recorded the highest mean score of 15.85 (SD = 4.34) with a minimum of 6. This reflects that entrepreneurs generally perceived a moderate to high degree of variety in available funding avenues, though the relatively high standard deviation points to a heterogeneous perception of funding diversity.

Variable 2 (ease of access to finance) followed closely with a mean score of 15.46 (SD = 4.36), suggesting that entrepreneurs rated the accessibility of finance as moderately

favourable. However, the spread of responses indicates that accessibility remains uneven across the entrepreneurial community.

Variable 3 (cost and affordability of funding) reported a mean score of 15.21 (SD = 4.21), indicating that the affordability aspect of financing received moderate approval. This finding suggests that while some of the entrepreneurs found funding costs manageable, others perceived them as burdensome.

Variable 4 (government policy and support) exhibited a lower mean score of 14.36 (SD = 3.52), pointing to a relatively lower perceived effectiveness of governmental interventions and support systems in facilitating Start-up financing. The narrower standard deviation compared to other variables implies a more consistent, though less favourable, perception among entrepreneurs regarding this determinant.

Finally, Variable 5 (impact of funding on business growth) recorded the lowest mean score at 13.82 (SD = 3.50). This indicates that many entrepreneurs felt the funding they received had a limited effect on accelerating their business growth. The modest variation in responses (as indicated by the lower standard deviation) reinforces the finding that the perceived growth impact is consistently rated low across the sample. The heterogeneity in standard deviations further indicates that policy measures may need to be sector-specific or region-specific to address the differing experiences among entrepreneurs.

Table 4.17

Pearson Correlation of Variables

Sl. No.	Variables	Availability of funding options	Ease of access to finance	Cost and affordability of funding	Government policy and support	Impact of funding on business growth	Satisfaction of Entrepreneurs
1	Availability of funding options	1.00	-	-	-	-	-
2	Ease of access to finance	.4378	1.00	-	-	-	-

Sl. No.	Variables	Availability of funding options	Ease of access to finance	Cost and affordability of funding	Government policy and support	Impact of funding on business growth	Satisfaction of Entrepreneurs
3	Cost and affordability of funding	.5273	.4823	1.00	-	-	-
4	Government policy and support	.6123	.5213	.2134	1.00	-	-
5	Impact of funding on business growth	.2121	.6132	.3125	.4123	1.00	-
6	Satisfaction of Entrepreneurs	.7212	.4121	.3235	.6712	.6712	1.00

Source: Primary data

4.17.1.4 Interpretation

The table no. 4.17, reveals that Pearson correlation analysis reveals significant associations among the studied variables of funding strategies and entrepreneurial satisfaction. Availability of funding options shows a strong positive correlation with the satisfaction of entrepreneurs ($r = 0.7212$). This indicates that when entrepreneurs have more funding choices, their overall satisfaction improves. Ease of access to finance also exhibits a moderate to strong positive relationship with both impact on business growth ($r = 0.6132$) and cost and affordability of funding ($r = 0.4823$). This suggests that financial accessibility not only reduces cost burdens but also facilitates growth. Government policy and support are strongly correlated with the availability of funding options ($r = 0.6123$) and satisfaction of entrepreneurs ($r = 0.6712$), reflecting the crucial role of supportive policy frameworks in enhancing funding opportunities and entrepreneurial outcomes. Similarly, the impact of funding on business growth is positively related to satisfaction ($r = 0.6712$), underlining that adequate financing contributes directly to sustainable entrepreneurial success. Overall, the results confirm that funding availability, affordability, and government support collectively influence growth outcomes and significantly enhance entrepreneurial satisfaction. The results obtained from the running satisfaction of

entrepreneurs about Start-up finance on the variables mentioned above are furnished in the following table.

Table 4.18

The Ordered Multinomial Logit Model to identify the Level of Satisfaction of Entrepreneurs towards Start-up Finance

Sl. No.	Variables	Coefficient	Standard Error	Z Value
1	Variability of funding options	1.00193	.1958584	5.11 (0.000)**
2	Ease of access to finance	.0127573	.00235	5.41 (0.000)**
3	Cost and affordability of funding	.5064295	.02103887	2.14 (0.016)**
4	Government policy and support	.0558865	.00147901	4.00196 (0.000)**
5	Impact of funding on business growth	.0838593	.01518694	5.5218 (0.000)**
	<i>Cut 1</i>	16.48143	1.332286	
	<i>Cut 2</i>	21.30505	1.629039	
	<i>Cut 3</i>	27.2479	2.041624	
	<i>Cut 4</i>	34.66133	2.533913	
$X^2 = 690.58(0.000)^*$				
pseudo $R^2 = 0.7121$				

Figures in brackets are p-values

*** shows significance at 5% level*

Cut 1, Cut 2, Cut 3, and Cut 4 are respectively the intercepts of the second, third and fourth categories, the intercepts of the lowest category being normalised to zero.

4.17.1.5 Interpretation

The regression coefficients given in Table 4.18 are ordered log-odds (ie, logit) coefficients. The statistical significance of an individual regression coefficient is measured by the z value. All the coefficients are positive and statistically significant at 5% level. An increase in any of the independent variables increases the ordered log-odds of being in a higher satisfaction category. The increase in availability of funding options increases in a higher satisfaction category by 1.001193. This is true for satisfaction category 5 over 4, or of satisfaction category 4 over 3, or category 3 or 2

or 2 over 1. Other regression coefficients are also interpreted similarly. Under the null hypothesis that all regression coefficients are zero, the Likelihood ratio (LR) test follows X^2 distribution.

The model yielded a likelihood ratio chi-square statistic ($\chi^2 = 69.058$, $p < 0.01$), indicating that the set of independent variables, taken together, significantly explains variation in the level of satisfaction of entrepreneurs. The pseudo R^2 value of 0.7121 suggests a strong explanatory power, implying that over 71% of the variation in satisfaction can be accounted for by the included determinants.

Variability of funding options emerged as a highly significant determinant ($\beta = 1.00193$, $z = 5.11$, $p < 0.01$), indicating that greater diversity in funding avenues substantially increases the likelihood of entrepreneurs reporting higher satisfaction. This aligns with the descriptive findings, where variability recorded the highest mean score, and the correlation analysis showed a strong positive association with satisfaction.

Ease of access to finance also had a significant positive effect ($\beta = 0.0127573$, $z = 5.41$, $p < 0.01$). This result implies that, controlling for other factors, improved accessibility to finance increases satisfaction levels. The small coefficient reflects the scaling of the composite variable but does not diminish its statistical importance.

Cost and affordability of funding were statistically significant at the 5% level ($\beta = 0.5064295$, $z = 2.14$, $p < 0.05$), suggesting that entrepreneurs who find funding more affordable are more likely to be satisfied. However, the relatively smaller coefficient compared to funding diversity indicates that affordability plays a supporting rather than dominant role in influencing satisfaction.

Government policy and support had a positive and significant coefficient ($\beta = 0.0558865$, $z = 4.002$, $p < 0.01$), underscoring the importance of policy interventions and institutional support in shaping favourable financing experiences for entrepreneurs. This finding reinforces the correlation results, where policy support had one of the strongest relationships with the level of satisfaction. Impact of funding on business growth was also a highly significant predictor ($\beta = 0.0838593$, $z = 5.522$,

$p < 0.01$), suggesting that when financing is perceived as directly contributing to enterprise growth, satisfaction levels rise considerably.

The estimated cut points (Cut 1 through Cut 4) represent the thresholds between satisfaction categories on the latent scale. These values are statistically meaningful for model classification but are not interpreted in isolation; rather, they aid in determining the probability of an entrepreneur falling into each satisfaction category given the predictor values.

The model results confirm that all five determinants, funding diversity, accessibility, affordability, policy support, and growth impact, significantly influence the level of satisfaction of entrepreneurs with Start-up financing. Among them, variability of funding options exerts the largest marginal effect, followed by the impact of funding on growth and ease of access to finance, highlighting the multifaceted nature of financial satisfaction in the entrepreneurial ecosystem. In practice, it is often useful to compute the odds ratio to interpret the various coefficients. This is given in the following table 4.19.

Table 4.19

Odds Ratio of satisfaction of entrepreneurs towards Start-up finance

Sl. No.	Variables	Odds ratio	z Value
1	Variability of funding options	2.721527	5.11(0.000)**
2	Ease of access to finance	1.012839	5.41(0.000)**
3	Cost and affordability of funding	1.659356	2.14(0.016)**
4	Government policy and support	1.005904	4.00196(0.000)**
5	Impact of funding on business growth	1.087476	5.5218(0.000)**
	<i>Cut 1</i>	16.48143	
	<i>Cut 2</i>	21.30505	
	<i>Cut 3</i>	27.2479	
	<i>Cut 4</i>	34.66133	

Source: Primary data

Figures in brackets are p-values

** shows significance at 5% level

Cut 1, Cut 2, Cut 3, Cut 4 are respectively, the intercepts of the second, third and fourth category, the intercepts of the lowest category being normalised to zero.

4.17.1.6 Interpretation

The Odds ratios are obtained by exponentiating the estimated regression coefficients. Consider the odds ratio of the availability of funding options. It is equal to 2.721527. This means that if we increase the availability of funding by 1 unit, the odds in favour of a higher satisfaction category over a low category are greater than 1. Similarly, for other variables

While the coefficients from the Ordered Multinomial Logit Model provide information about the direction and statistical significance of relationships, their direct magnitudes are often difficult to interpret in a practical context. To address this, the coefficients were transformed into odds ratios, which offer a more intuitive understanding of how changes in each independent variable influence the likelihood of entrepreneurs reporting higher levels of satisfaction. The odds ratios for each determinant are presented in Table No.19

Variability of funding options exhibits an odds ratio of 2.7215, indicating that, holding all other factors constant, a one-unit increase in the perceived variability of funding options increases the odds of an entrepreneur moving to a higher satisfaction category by approximately 172%. This is a substantial effect, reinforcing the earlier finding that diversity in funding sources is the most influential factor driving satisfaction.

Ease of access to finance has an odds ratio of 1.0128, suggesting that each one-unit increase in the accessibility score raises the odds of higher satisfaction by 1.28%. While the percentage change is modest, the variable remains statistically significant at the 1% level, indicating that accessibility exerts a consistent, albeit smaller, positive effect on satisfaction.

Cost and affordability of funding show an odds ratio of 1.6594. This means that for each one-unit improvement in the affordability score, the odds of an entrepreneur moving to a higher satisfaction level increase by 65.9%. This underlines the importance of affordable financing as a critical enabler of entrepreneurial success, even though its influence is slightly less pronounced than funding diversity.

Government policy and support records an odds ratio of 1.0059, indicating that a one-unit increase in perceived policy effectiveness raises the odds of higher satisfaction by 0.59%. Although the percentage change per unit is small, the significance level ($p < 0.01$) suggests that consistent and favourable policy support contributes meaningfully to entrepreneurs' satisfaction over time.

Impact of funding on business growth has an odds ratio of 1.0875, meaning that for every one-unit increase in the perceived growth impact score, the odds of reporting higher satisfaction rise by 8.75%. This finding is consistent with the regression results, where this variable emerged as one of the strongest predictors after funding diversity.

The cut points (Cut 1 to Cut 4) represent the estimated thresholds between successive satisfaction categories on the underlying latent scale, with the lowest category's intercept normalised to zero for identification purposes. While these values are not directly interpretable in substantive terms, they are essential for model estimation and probability prediction. The likelihood ratio chi-square statistic ($\chi^2 = 690.58$, $p < 0.01$) confirms the joint significance of the model, while the pseudo R^2 value of 0.7121 indicates a strong model fit.

4.17.1.7 Summary of Analysis of the level of satisfaction of entrepreneurs towards Start-up finance

The descriptive statistics indicate that entrepreneurs exhibit moderate satisfaction (mean = 3.05), with considerable variation across respondents, highlighting both positive and negative financing experiences. Among the determinants, variability of funding options recorded the highest mean, reflecting entrepreneurs' appreciation of diverse financial avenues, whereas the impact of funding on business growth scored the lowest, signifying concerns about the long-term developmental effects of available financing. The Pearson correlation analysis confirms strong positive associations between satisfaction and all determinants, particularly with the availability of funding options ($r = 0.7212$) and government policy and support ($r = 0.6712$). These findings underscore that when entrepreneurs have broader funding choices and effective institutional support, their satisfaction levels rise significantly. The analysis on the level of satisfaction of entrepreneurs towards Start-up finance, conducted through the

Ordered Multinomial Logit Model, reveals that multiple financial and policy-related determinants significantly shape entrepreneurial satisfaction levels. Results from the Ordered Multinomial Logit Model further strengthen these relationships, as all coefficients were positive and statistically significant at the 5% level. The model demonstrated high explanatory power (Pseudo $R^2 = 0.7121$; $\chi^2 = 690.58$, $p < 0.01$), indicating that over 71% of the variation in satisfaction is explained by the selected determinants. Among them, variability of funding options ($\beta = 1.00193$) emerged as the most influential factor, followed by the impact of funding on business growth and ease of access to finance, showing that entrepreneurs value both diversity and growth-enabling finance.

The odds ratio results provide an intuitive interpretation of these effects. Variability of funding options showed the largest effect (OR = 2.7215), implying that increasing funding variety substantially enhances satisfaction levels. Similarly, affordability of funding (OR = 1.6594) and impact on business growth (OR = 1.0875) positively influence satisfaction, while government policy and support (OR = 1.0059), though smaller in magnitude, remains statistically significant, emphasising the cumulative importance of consistent policy backing. Overall, the findings reveal that entrepreneurial satisfaction with Start-up finance is multi-dimensional, driven primarily by access diversity, affordability, supportive policy mechanisms and growth outcomes. The results highlight that improving financial accessibility, expanding funding channels and strengthening policy interventions are crucial to enhancing satisfaction and ensuring sustainable entrepreneurial development in the Start-up ecosystem.

4.18 PART IV: ANALYSE THE MULTIFACETED RISKS OF AVAILING START-UP FUNDING IN KERALA.

Entrepreneurs of Start-ups face many types of risks associated with Start-up funding. The identified five types of risks are.

- Financial risks
- Regulatory and Compliance Risks
- Market and Economic Risks

- Investor and Lender risks
- Operational and Management risks

To understand the perception of entrepreneurs about Start-up funding, four questions were asked about each dimension on a five-point Likert scale. Data on each dimension has been obtained by adding together values obtained from the Likert scale on each dimension. The analysis intended to assess the multifaceted risks of availing Start-up funding in Kerala.

4.18.1 Statistical Analysis of the Multifaceted Risks of Availing Start-up Funding in Kerala

The following analytical tools were used for analysis.

- One-way ANOVA
- Post Hoc Analysis

4.18.1.1 Analysis of Variance (ANOVA)

For identifying the Start-up owners' perceptions about different types of risks associated with availing Start-up finance, one-way Analysis of Variance were used. One-way ANOVA were used to compare means of more than two populations. In this case, test the equality of means through variances and make use of the F-statistic. This test provided a systematic method to assess how entrepreneurs with different backgrounds perceive financial, regulatory and compliance, market and economic, investor and lender and operational and management risks in accessing Start-up funding. The test is based on the following null alternative hypothesis

$H_0: \mu_1 = \mu_2 = \mu_3 \dots \mu_k$ (all the population means are equal)

H_1 : Not all means are equal

The F Statistic used to test the above hypothesis is

$$F = \frac{MSC}{MSE}$$

Where MSC is the mean of the squares between columns and MSE is the mean of squares of individuals or errors. F values obtained from the sample are greater than the critical lending for the regression of H_0 in favour of H_1

The Tukey test, a post-hoc test, has been used to after one-way ANOVA to determine which specific group means differ significantly from each other.

$$Q = \frac{(|M_i - M_j|)}{\sqrt{MS \text{ within}}}$$

Where $|M_i - M_j|$ is the absolute difference between two groups, and MS within is the mean square within groups from the ANOVA table.

4.18.1.2 Tukey Post Hoc Test for Multiple Comparisons

The Tukey Post Hoc Test is applied following a one-way ANOVA when the F-test indicates significant differences among the groups being compared. This test specifically identifies which pairs of group means differ significantly, allowing for a clearer understanding of the nature and extent of variations between the groups.

The following hypotheses were constructed to test the multifaceted risks of availing Start-up funding in Kerala.

H_0 : There is no significant difference in the perception of entrepreneurs about financial, regulatory compliance, market economic, investor and lender, operational and management risks for availing Start-up finance.

H_1 : There is a significant difference in the perception of entrepreneurs about financial, regulatory compliance, market economic, investor and lender, operational and management risks for availing Start-up finance.

To test the above hypotheses, One-Way ANOVA has been performed on the types of risks mentioned above. The results are furnished in Table 4.20

Table 4.20*One-Way ANOVA - Types of Risks Associated with Start-up Funding*

Sl. No.	Variables	Mean	F
1	Financial Risks	17.24	1524.662(0.000)***
2	Regulatory and Compliance Risks	9.32	
3	Market and Economic Risks	15.70	
4	Investor and Lender Risks	12.94	
5	Operational and Management Risks	9.48	

Source: Primary Data

Figures in brackets are *p*Values.

** shows significance at 5% level.

4.18.1.3 Interpretations

It is clear from Table 4.20 that there is a significant difference in the perception of entrepreneurs about various types of risks associated with availing Start-up financing. Open($F = 1524.662, P = 0.000$) Financial risk seems to be the highest (17.24), followed by market and economic risks (15.70), investor and lender risks (12.94). There is not much difference between regulatory and compliance risks and operational and management risks.

Among the five risk dimensions, Financial Risks recorded the highest mean score (17.24), clearly emerging as the most critical concern for entrepreneurs in Kerala. This finding suggests that issues such as repayment obligations, high cost of borrowing, limited cash flows and the possibility of financial instability weigh heavily on the minds of Start-up founders. The predominance of financial risk aligns with the broader literature on entrepreneurial finance, where capital inadequacy and funding constraints are frequently highlighted as major obstacles to Start-up survival and growth.

The second-highest risk dimension is Market and Economic Risks (mean = 15.70). This indicates that entrepreneurs are significantly concerned about fluctuating market demand, economic downturns, and unpredictable consumer behaviour, which directly affect the stability and growth prospects of their ventures. In a volatile economic

environment such as Kerala's, where consumer purchasing power and industry competition can change rapidly, such concerns are well justified.

Investor and Lender Risks rank third (mean = 12.94). This reflects apprehensions regarding dependency on investors, stringent lending terms, pressure from external financiers, and potential conflicts with venture capitalists or angel investors. These risks highlight the delicate balance entrepreneurs must maintain in safeguarding their ownership rights and decision-making autonomy while also satisfying investor expectations.

By contrast, Regulatory and Compliance Risks (mean = 9.32) and Operational and Management Risks (mean = 9.48) recorded relatively lower mean scores, suggesting that entrepreneurs perceive these risks as less critical compared to financial and market-related challenges. While compliance with government regulations, legal procedures and operational hurdles remains relevant, they are not perceived as the primary barriers in accessing and utilising Start-up funding. Notably, the closeness of these two scores indicates that entrepreneurs may view them as interrelated or of comparable importance, but not as pressing as financial and market-based ones.

The analysis reveals a clear hierarchy of risks in the perception of Start-up owners. Financial and market-related uncertainties dominate entrepreneurial concerns, while regulatory, operational, and managerial risks are perceived as secondary. This hierarchy highlights the need for policymakers, financial institutions and Start-up support systems to design interventions that directly address the financial insecurities and market vulnerabilities of entrepreneurs. Strengthening financial literacy, improving access to affordable funding, and developing safety nets against economic fluctuations could play a crucial role in mitigating these risks. The ANOVA confirms that the perception of risks of entrepreneurs are not homogeneous, instead vary significantly across different dimensions. This result provides important empirical evidence for understanding the complexity of Start-up funding challenges in Kerala and highlights the areas where targeted support and reforms are most urgently required. In order to further investigate the possible difference between the average

risks associated with each risk category, the Tukey test is used, the results of which are furnished below.

4.18.1.4 Post Hoc Analysis

While the one-way ANOVA test establishes that there are statistically significant differences in the perception of entrepreneurs regarding various types of risks associated with Start-up funding, it does not specify which pairs of risk categories differ from each other. To gain deeper insights, it is necessary to conduct post hoc multiple comparison tests, Tukey's HSD (Honestly Significant Difference) test. A Post Hoc analysis would allow us to identify the exact nature of the differences among the five dimensions of risk. For instance, it can confirm whether the perception of Financial Risks is significantly higher than that of Market and Economic Risks, or whether Regulatory and Compliance Risks and Operational and Management Risks are statistically indistinguishable in the eyes of entrepreneurs

The analysis is particularly important in the present study, as the results of ANOVA reveal a wide disparity in mean scores across risk dimensions. Post hoc comparisons will provide clarity on the relative severity of risks, enabling researchers to draw more nuanced conclusions. Moreover, these findings will be valuable for policymakers and financial institutions, as they will highlight the most critical risk categories that demand immediate attention and intervention.

Table 4.21

Tukey Post Hoc Multiple Comparison Test for identifying the pairs of risk Categories that are Dissimilar to one another

Sl. No.	Variables	Mean difference
1	Financial Risk Vs Regulatory and Compliance Risks	7.925(0.000)**
2	Financial Risk Vs Market and Economic Risks	1.541(0.000)**
3	Financial Risk Vs Investor and Lender Risks	4.297(0.000)**
4	Financial Risk Vs(0.000) Operational and management risk	7.766(0.000)**

Sl. No.	Variables	Mean difference
5	Regulatory and Compliance Risks Vs Market and Economic Risks	6.384(0.000)**
6	Regulatory and Compliance Risks Vs Investor and Lender Risks	3.628(0.000)**
7	Regulatory and Compliance Risks Vs Operational and Management Risks	0.159(0.734)
8	Market and Economic Risks Vs Investor and Lender Risks	2.756(0.000)**
9	Market and Economic Risks Vs Operational and Management Risks	6.225(0.000)**
10	Investor and Lender Risks Vs Operational and Management Risk	3.469(0.000)**

Source: Primary Data

Figures in brackets are *p*Values.

** shows significance at 5% level.

4.18.1.5 Interpretations

The post hoc analysis using Tukey's Multiple Comparison Test was conducted to determine the specific differences between various dimensions of risks associated with Start-up funding in Kerala. The results, presented in Table 4.21, reveal several critical insights into how entrepreneurs perceive different categories of risks.

Financial Risk is found to be significantly higher in perception compared to all other risk dimensions. The mean difference between Financial Risk and Regulatory and Compliance Risk (7.925, $p = 0.000$), Financial Risk and Investor and Lender Risk (4.297, $p = 0.000$), and Financial Risk and Operational and Management Risk (7.766, $p = 0.000$) is large and highly significant. Even when compared with Market and Economic Risks, Financial Risk shows a significant difference (mean difference = 1.541, $p = 0.000$), indicating that entrepreneurs rank financial challenges as the foremost risk in availing Start-up funding.

Regulatory and Compliance Risks are perceived to be substantially lower than Market and Economic Risks (mean difference = 6.384, $p = 0.000$) and Investor and Lender Risks (3.628, $p = 0.000$). However, no significant difference was found between

Regulatory and Compliance Risks and Operational and Management Risks (mean difference = 0.159, $p = 0.734$). This suggests that entrepreneurs view these two dimensions as relatively less threatening and almost equal in intensity when compared to financial and market risks.

Market and Economic Risks are ranked significantly higher than both Investor and Lender Risks (mean difference = 2.756, $p = 0.000$) and Operational and Management Risks (6.225, $p = 0.000$). This indicates that fluctuations in the external business environment, economic downturns and market uncertainties are perceived as greater obstacles compared to internal operational or lender-related risks.

Investor and Lender Risks also differ significantly from Operational and Management Risks (mean difference = 3.469, $p = 0.000$), highlighting that entrepreneurs perceive investor and lender conditions (such as stringent requirements, repayment terms, or control-related risks) as more critical than day-to-day operational risks.

The Tukey test reinforces the findings of ANOVA by showing that not all risks are perceived equally. Financial Risks emerge as the most dominant concern for Start-ups, followed by Market and Economic Risks, Investor and Lender Risks, while Regulatory/Compliance and Operational/Management Risks are seen as the least severe and statistically similar. This nuanced understanding highlights the hierarchy of risk perception among entrepreneurs in Kerala, thereby providing direction for policymakers, financial institutions and support organisations to prioritise interventions.

4.18.1.6 Summary of Analysis of the multifaceted risks of availing Start-up funding in Kerala

The analysis of the multifaceted risks associated with availing Start-up funding in Kerala reveals that entrepreneurs perceive significant variations across different categories of risks. Results from the one-way ANOVA indicate a highly significant difference in mean scores among the five risk dimensions ($F = 1524.662$, $p < 0.001$). This confirms that the perception of entrepreneurs are not uniform. Financial Risk emerged as the most dominant concern (mean = 17.24), highlights the entrepreneurs'

apprehensions regarding repayment pressures, limited liquidity and capital inadequacy. This was followed by Market and Economic Risks (mean = 15.70), reflecting worries about fluctuating demand, economic instability and market unpredictability. Investor and Lenders Risks (mean = 12.94) ranked third, pointing to issues such as stringent loan conditions and potential conflicts with financiers. In contrast, Regulatory and Compliance Risks (mean = 9.32) and Operational and Management Risks (mean = 9.48) were perceived as relatively minor concerns.

The Tukey's Post Hoc Test provided deeper insight into these differences, showing that Financial Risk is significantly higher than all other risk types. Furthermore, Market and Economic Risks are significantly greater than Investor, Regulatory and Operational Risks. Interestingly, no significant difference was observed between Regulatory and Operational Risks, suggesting that entrepreneurs view these as nearly equivalent in severity. The findings establish a clear hierarchy of risk perception among Start-up entrepreneurs in Kerala. This demonstrates that financial and market-related challenges dominate the entrepreneurial risk landscape, while regulatory and operational issues are considered secondary. The study underscores the need for policy interventions and financial reforms aimed at reducing financial vulnerability, improving funding accessibility and strengthening market resilience to support sustainable Start-up growth in Kerala.

4.19 CONCLUSION

The analysis undertaken in this study provides a comprehensive picture of Kerala's evolving Start-up ecosystem by examining government initiatives, funding strategies, entrepreneurial perceptions and risk dynamics. The findings clearly indicate that the State has established a robust framework of financial support, infrastructural facilities and institutional mechanisms that collectively contribute to the promotion of Start-ups. Programmes in skill development and mentorship further strengthen entrepreneurial capacities, while performance outcomes reflect Kerala's growing role in the national Start-up landscape. At the same time, the statistical examination of funding strategies through the multinomial logistic model underscores that entrepreneurs' choices are significantly influenced by factors such as awareness, risk

tolerance, accessibility, financial considerations and prior experience. These results affirm that funding preferences are neither uniform nor random but are shaped by a complex interplay of financial, strategic and experiential determinants.

Equally important are the insights generated on the risks associated with availing Start-up funding. The one-way ANOVA and Post Hoc Analyses reveal significant differences in entrepreneurs' perceptions across risk categories, with financial and market risks emerging as dominant concerns, while regulatory, compliance and operational risks are comparatively less pronounced. This hierarchy of risk perception highlights the vulnerabilities that continue to challenge Start-up founders despite the state's supportive ecosystem. Taken together, the findings demonstrate both the strengths and gaps in Kerala's Start-up environment. They point to the need for targeted interventions to mitigate financial insecurities, stabilise market uncertainties and balance investor-entrepreneur relationships. The empirical evidence presented in this chapter establishes a solid foundation for the subsequent discussion and policy recommendations, situating Kerala's experience within broader debates on entrepreneurial finance and ecosystem development.

Chapter 5

SUMMARY OF FINDINGS AND CONCLUSION

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5.1 INTRODUCTION

This chapter presents the key findings and conclusions derived from the analysis of data collected from Start-ups in Kerala. It aims at summarising the findings and their possibilities to correspond to the objectives of the study and to outline the observations that are made with respect to the funding ecosystem of Start-ups in the state. The results are also well assembled to capture the main areas of study such as the initiatives taken by the government of Kerala to support entrepreneurship with financial and infrastructural assistance and the patterns and determinants of choice of funding strategies among Start-ups. Furthermore, the degree of satisfaction expressed by entrepreneurs with relation to the sufficiency, time and access to financial support and the risks and difficulties of availing and managing Start-up finance. The conclusions will be made through the connection of empirical data and the objectives and research questions stated. They provide a detailed insight into the effects of funding policies on the growth and sustainability of entrepreneurial ventures in Kerala. Besides, the results indicate that there are loopholes in the policy framework and practical accessibility. It can be utilised in drawing significant implications to the policy makers, financial institutions, incubators and entrepreneurs. The summary of findings combines them into a logical account that presents both the strong and the weak aspects of the present funding environment. It can be used as a foundation for recognising the spheres in which strategic interventions are required in the Start-up ecosystem of Kerala.

5.2 PROBLEM IN BRIEF

Kerala Start-up ecosystem has experienced an impressive growth over the past decade, with the governmental support, a highly literate workforce and the culture of

innovation. Despite the conducive environment, access to timely and adequate funding continues to be a critical challenge for emerging ventures. Start-ups, by nature, operate in an environment that necessitates taking risks, quick innovations and scalability. In this context, financial constraint in this front is always an issue that can restrict their operation, entry into new markets and competitiveness. Though a number of financial schemes and incubation facilities have been introduced by the Kerala government through initiatives such as KSUM. The use of these resources remains skewed due to lack of awareness, procedural obstacles and delays in the disbursement of funds.

It is also discovered that entrepreneurs have great challenges in choosing appropriate funding strategies amidst various options, such as equity financing, venture capital, angel investments, bank loans and emerging opportunities such as crowdfunding. Inadequate advice in the analysis of these options usually ends up in bad financial decisions culminating in capital deficits, excessive repayment or watering down of ownership. Sufficient studies on the selection and management of sources of finance by the Start-ups in Kerala are not available. In turn, there is an urgent necessity to evaluate the efficiency of the current financing models, evaluate the satisfaction of the entrepreneurs with the financial support and determine the risks and barriers preventing financial accessibility. These issues need to be tackled in a very serious manner so as to make sure that the role of the Kerala Start-up ecosystem as a source of innovation, employment creation and sustainable economic development.

5.3 OBJECTIVES OF THE STUDY

1. To examine the various initiatives of the government of Kerala in providing financial and other facilities for promoting Start-ups.
2. To analyse the choice of selecting funding strategies in Start-ups.
3. To study the level of satisfaction of entrepreneurs towards Start-up Finance.
4. To analyse the multifaceted risks of availing Start-up funding in Kerala

5.4 HYPOTHESES OF THE STUDY

1. H_0 : There is no significant relationship between the choice of selecting funding strategies and Awareness and knowledge of available funding options, Financial considerations and the cost of capital, Risk tolerance and control over business operations, Accessibility and availability of funding sources, Impact on business growth and sustainability and External influences and strategic considerations.
2. H_1 : There is a significant relationship between the choice of selecting funding strategies and Awareness and knowledge of available funding options, Financial considerations and the cost of capital, Risk tolerance and control over business operations, Accessibility and availability of funding sources, Impact on business growth and sustainability and External influences and strategic considerations.
3. H_0 : The satisfaction of entrepreneurs towards Start-up finance is not significantly related to the variability of funding options, ease of access to finance, cost and affordability of funding, government policy and support, and impact of funding on business growth.
4. H_1 : The satisfaction of entrepreneurs towards Start-up finance is significantly related to the variability of funding options, ease of access to finance, cost and affordability of funding, government policy and support, and the impact of funding on business growth.
5. H_0 : There is no significant difference in the perception of entrepreneurs about financial, regulatory compliance, market economic, investor and lender, operational and management risks for availing Start-up finance.
6. H_1 : There is a significant difference in the perception of entrepreneurs about financial, regulatory compliance, market economic, investor and lender, operational and management risks for availing Start-up finance.

5.5 METHODOLOGY OF THE STUDY

The present study used a descriptive and inferential research design, which aimed at exploring and interpreting the strategies used by Start-ups in Kerala in terms of

funding. Primary and secondary data were utilised to have a broad insight into the objectives of the research. A structured questionnaire was used to gather primary data by taking a statistically selected sample of 357 Start-up founders registered under the Kerala Start-up Mission (KSUM). The credible sources of secondary data, like government reports, policy documents, KSUM annual reports and other academic and industry literature, were used. The questionnaire used multiple constructs measured with a 5-point Likert scale, focusing on the choice of funding strategy, level of satisfaction with Start-up finance and the multifaceted risks of availing Start-up funding. The pilot study and testing in terms of Cronbach's alpha were used to determine the instrument's reliability and validity and all the scales were found to be above the acceptable limit.

The data analysis and interpretation were done using both qualitative and quantitative methods. The governmental programs and institutional assistance mechanisms were interpreted through a qualitative analysis. Quantitative analysis was done using the statistical tools such as descriptive statistics, correlation analysis and inferential models. The Multinomial Logit Model (MLM) was utilised in finding out influencing factors on the choice of selecting funding strategies, and the Ordered Multinomial Logit Model (OLM) and Odds Ratio in quantifying the level of satisfaction among entrepreneurs towards Start-up finance. In addition, ANOVA and the Post Hoc tests of Tukey were used to compare the differences to groups in terms of perception of risks related to availing Start-up funding. A combination of these statistical techniques, which is backed by SPSS and STATA software, brought in methodological accuracy, validity and depth in addressing the research objectives.

5.6 MAJOR FINDINGS OF THE STUDY

The present study was structured around the core research objectives, each addressing a distinct dimension of Kerala's Start-up ecosystem. The objective-wise major findings of the study are as follows:

5.6.1 Objective 1 - To examine the various initiatives of the government of Kerala in providing financial and other facilities for promoting Start-ups

The findings are organised under four broad categories.

- A. Financial Support and Infrastructure.
- B. Skill Development and Mentorship.
- C. Start-up Performance Outcomes.
- D. Contribution and Institutional Ecosystem of Kerala.

5.6.1.1 Financial Support and Infrastructure.

1. Kerala has put in place a multi-layered financial architecture of Start-ups, including seed fund, prototype grants, scale-up support, matching grants and equity financing via KSUM and its partner networks.
2. The Kerala Start-up Investment Fund (KSIF) and state-supported equity participation schemes have facilitated early-stage and growth-stage business persons to get venture funding and have also brought in angel and Venture Capital.
3. The use of financial incentives, including reimbursement in the form of rentals, reimbursement in the form of patents and tax benefits, has made the operations of the Start-ups easier to bear and hence increased the chances of survival and expansion.
4. The Start-ups supported by dedicated Fab Labs, Bio-Innovation Centres, Maker Villages and Industrial Parks that have been created to give Fabrication infrastructure, prototyping and shared workspace to encourage innovation in Kerala.

5.6.1.2 Skill Development and Mentorship.

5. Thousands of entrepreneurs could be trained at Entrepreneurship Development Programmes (EDPs) and Founder Bootcamps of KSUM, using lean Start-up principles, strategies of raising funds and product-market fit analysis.

6. The Hackathons, investor engagement forums and Start-up networking platforms have been recognised to create a pipeline of innovation and more than 200 prototypes are moving to incubation or funding stages and international linkages between investors have been created.
7. The number of student Start-ups mentored in more than 4,000 and incubated through Innovation and Entrepreneurship Development Centres (IEDCs) with higher education institutions, support of faculty mentorship, industry veterans and formal innovation labs, including the IIM Kozhikode Innovation Lab.
8. The Kerala Development and Innovation Strategic Council (K-DISC) has also combined skill development and innovation, including the Young Innovators Programme (YIP) and the Skill Delivery Platform Kerala (SDPK), which together trained more than 10,000 youth and entrepreneurs.
9. The government of Kerala initiatives might lead to inclusive mentorship networks where women entrepreneurs, rural innovators and student-led enterprises are the focus of the initiatives, thereby democratising access to entrepreneurship in Kerala.

5.6.1.3 Start-up Performance Outcomes

10. Kerala will surpass 6,400 registered Start-ups, 3,500 of which are DPIIT-recognised ventures by 2025 with a consistent 20-percent growth rate per annum.
11. The ecosystem created 65,000 Plus direct employment and involved over 100,000 students every year in incubator and IEDC networks.
12. Kerala Start-ups had over 665 million of cumulative funding in terms of domestic and international investor confidence.
13. It has already been diversified at the sectoral level, with IT & Software (25%), AI and Robotics (20%), and Healthcare and Life Sciences (18%) becoming monopolies, as well as Agritech, EVs and Clean Energy have started to emerge.

14. Reimbursement schemes have helped in the creation of intellectual property and resulted in 74 lakh worth of patent reimbursement and more prototype-to-market transitions.
15. The Start-up ecosystem was also significant to the state economy and the Start-ups have a part in the 11.7% growth of GSDP in Kerala in 2024-25.

5.6.1.4 Kerala's Contribution and Institutional Ecosystem

16. The successive policies (2014, 2018 & 2021) have made Kerala one of the best-performing Start-up ecosystems in India, which incorporates inclusiveness, sustainability and deep-tech innovation.
17. The organised policies, international roadshows and collaboration with institutions such as IIM Kozhikode, IIT Palakkad, NIT Kozhikode and CUSAT Kochi increased the value of Kerala Start-up ecosystem by 147 percent, compared to the averages in the country.
18. The ecosystem of Kerala is the only one recognised in the nation, as being inclusive, focusing on women entrepreneurs, rural innovators and student-led enterprises via its extensive IEDCs and grassroots innovation programmes.
19. The KSUM, K-DISC, Technopark and Kerala State Planning Board have worked as the main pillars of innovation governance, connecting Start-ups with the financial, infrastructural and mentorship networks.
20. The future roadmap in Kerala focuses on deep-tech, sustainable entrepreneurship and global competitiveness and aims to achieve an industrial valuation of 15.1 billion by 2028, owing to environment-friendly technologies, Industry 4.0 integration and global capability centres.

5.6.2 Objective 2 - To Analyse the Choice of Selecting Funding Strategies in Start-ups

The key factors that influence the selection of these funding strategies were identified as.

- Awareness and knowledge of available funding options
- Financial considerations and the cost of capital
- Risk tolerance and control over business operations
- Accessibility and availability of funding sources
- Impact on business growth and sustainability
- External influences and strategic considerations

In order to study factors that affect the choice of selecting funding strategies, the Multinomial Logit Model (MLM) was used since the dependent variable consists of more than two unordered categorical outcomes. The Odds Ratio (OR) is determined to know the relative probability of an entrepreneur choosing a specific funding strategy in comparison to not choosing it. When the Odds Ratio is higher, this means that there is a positive effect in the choice of selecting funding strategies and when the Odds Ratio is lower, then this is vice versa. In order to determine the role of stages of Start-ups in determining the choice of selecting funding strategies, Start-ups were categorised into three stages that included the Early stage, Growth stage and Established stage, with the early stage being the reference category. In addition to the independent variables, there was also the introduction of the dummy variables, which would explain two qualitative features, that is, the stage of the development of the Start-up and the previous experience of the entrepreneurs. The model had dummy variables that were used to measure the difference in the influence of the growth and established stages on funding decisions. The experience in entrepreneurship was divided into first-time entrepreneurs and experienced entrepreneurs and the former was used as a reference category. The incorporation of these dummy variables allowed for a stringent evaluation of whether the business maturity and previous entrepreneurship experience would have a statistically significant effect on the decision to choice of selecting funding strategies.

The analysis of funding strategies can be done based on six groups, which include Group (1): Own fund, Group (2): Own + Debt Fund, Group (3): Own + Debt + Venture Capital Fund, Group (4): Own + Debt + Venture Capital + Angel Fund, Group (5): Own + Debt + Crowd Fund and Group (6): Own + Angel + Crowd Fund. When estimating the model, Group 1 (Own Funds) was picked as the reference category, since it is the most basic and least complicated type of funds that are typically adopted in the initial phases of entrepreneurship. The coefficient values of the reference category were hence normalised to zero. The key findings, which concern the decision on the choice of selecting funding strategies in Start-ups are given below.

21. In the selection of the funding strategy, it was identified that financial considerations and cost of capital were the most influential factors ($M = 15.65$, $SD = 3.71$).
22. The awareness and knowledge of the available source of funding options ($M = 11.44$), the risk exposure and control over business operations ($M = 11.36$), the external factors and strategic aspects ($M = 11.35$), the effect on the business growth and sustainability ($M = 11.10$), the accessibility and availability of source of funding ($M = 10.94$) moderately influenced the choice of selecting funding strategies of Start-ups.
23. Every stage like awareness and knowledge of the availability of funds, financial impact and cost of both capital, risk tolerance and control over operation in business, external influences and strategies, influence on business growth and sustainability as well as accessibility and availability of funding sources were having moderate variability (Standard deviations were between 3.11 and 3.71) in responses as the choice of selecting funding strategies of Start-ups.
24. The financial aspect and the cost of capital were also negatively correlated with the decision of choosing funding strategies ($r = -0.72$). This means that an increase in the cost of financing will greatly deter owners of Start-ups from selecting more complicated financing alternatives.

25. The availability and accessibility of funding sources had a negative relationship with the selection of funding strategies ($r = -0.63$). It means that even where funding is available, the Start-up owners have a lower probability of selecting some of the strategies that have a higher financial cost.
26. The Multinomial Logit Model shows that the Awareness, risk tolerance, accessibility, growth impact and external influences were prepared to give positive and significant outcomes at all times. The coefficients of all the groups, including (Own + Debt Fund), (Own + Debt + Venture Capital), (Own + Debt + Venture Capital + Angel Fund), (Own + Debt + Venture Capital + Crowd Fund) and (Own + Debt + Angel + Crowd Fund) show that these factors predispose to using more complex investment plans than own funds.
27. The cost of capital and financial consideration variables showed negative coefficients (r between -0.309 and -1.0188) in the case of Groups as (Own + Debt Fund), (Own + Debt + Venture Capital), (Own + Debt + Venture Capital + Angel Fund) and (Own + Debt + Angel + Crowd Fund). It means that increased costs significantly discourage the Start-up owners in adopting more complicated funding strategies.
28. The variables that affected the choice of funding strategy like Entrepreneurial experience, growth stage and establishment stage had great positive impacts. This shows that the more a business is mature, or the previously gained entrepreneurial experience of the Start-up owners, the more likely a more diversified choice of funding strategies can be introduced.
29. Entrepreneur awareness and knowledge had the largest effect in Group 5 (Own + Debt + Venture Capital + Crowd Fund) ($r = 2.7014$), then Group 3 (Own + Debt + Venture Capital + Angel Fund) ($r = 2.40$), and Group 4 (Own + Debt + Venture Capital + Crowd Fund) ($r = 2.40$). The lowest value was associated with the Group 2 (Own + Debt + Venture Capital) ($r = 0.8756$). These findings suggest that more awareness of the entrepreneur has a significant positive impact in increasing the decision to pursue more diversified funding strategies, but entrepreneurs who rely

primarily on debt are likely to have limited information about the other financing options.

30. Group 4 (Own + Debt + Venture Capital + Angel Fund) has the highest risk tolerance in terms of ($r = 0.9811$), then Group 3 (Own + Debt + Venture Capital + Angel Fund) ($r = 0.7825$). The least was recorded in Group 5 (Own + Debt + Venture Capital + Crowd Fund) ($r = 0.1243$). These outcomes imply that risk-taking increases the decision to rely more on diversified funding options and Start-up owners who opt to use crowdfunding options are more willing to have more control and lower risk.
31. The Group 5 (Own + Debt + Venture Capital + Crowd Fund) has the greatest accessibility and availability to funding sources ($r = 1.6944$). It means that the implementation of the heterogeneous combination of funding options would supplement the selection of broader funding strategies. The lowest value was recorded in Group 6 (Own + Debt + Angel Fund + Crowd Fund) ($r = 0.2450$). This finding indicates that despite the availability of different sources, there are still challenges that prevent entrepreneurs from choosing diversified funding strategies.
32. Group 6 (Own + Debt + Angel Fund + Crowd Fund) ($r = 2.7734$) and Group 5 (Own + Debt + Venture Capital + Crowd Fund) ($r = 2.0825$) have the greatest effect on business growth and sustainability. The Start-up having limited growth opportunities, has a more favorable affinity to the Group 2 (Own + Debt) ($r = 0.1135$), which means that the Start-up owners rely on their own and debt financing. The findings indicate that better growth prospects would go a long way in boosting the decision of adopting more diversified funding strategy and constrained growth potential would bring about discouragement of expanding funding option by Start-up owners.
33. Group 6 (Own + Debt + Angel Fund + Crowd Fund) had the highest number of external influences ($r = 3.7942$). This shows that external pressures put on the decision-making of entrepreneurs who were employing advanced and complicated combinations of funds are higher. Group 2 (Own + Debt coefficient = 0.3010)

exhibited the lowest. The findings indicate that high external pressure has a high likelihood of making more diversified funding decisions and entrepreneurs who rely primarily on their own and debt funds are less influenced by the external pressure.

34. Financial Considerations is negative in all the groups and has the strongest (-1.0188) deterring effect in Group 6 (Own + Debt + Angel Fund + Crowd Fund, which demonstrates that the own funds are the most economical to choose. This is indicative of the fact that own funds are still the most cost-effective to Start-up owners.
35. During the early stage, there is a higher level of awareness (Odds Ratio = 2.40), accessibility (Odds Ratio = 1.69), and external influences (Odds Ratio = 1.35), which were found to increase the probability of using a combination of debt and own funds, but greater financial considerations minimised the probability (Odds Ratio = 0.73). These findings suggest that Start-ups are more likely to contribute their own capital using debt at the initial phases of business in cases where they are more knowledgeable, have hassle-free access to finance and are also subject to outside influences. The cost aspect has also been a major limitation in the decision of selecting funding strategies.
36. In the entrepreneurial levels of established and growth, the greater the levels of awareness (Odds Ratio = 11.0), perceived growth potential (Odds Ratio = 6.6), and the previous entrepreneurial experience (Odds Ratio= 7.7), the stronger the likelihood of selecting venture capital and angel financing as a component of the financing mix. Conversely, this opportunity is still decreasing with increased financial expenses (Odds Ratio =0.60). In this case, the Odds Ratio is the relative probability of an entrepreneur choosing a specific funding strategy in response to not choosing a funding strategy. These results show that knowledge, business expansion opportunities and previous experience have a strong impact on the decision of adopting more diversified funding strategies. The high prices make entrepreneurs not adopt both external and personal finance.

37. In the established Start-ups, the growth potential (Odds Ratio = 8.0-131.0), external influences (Odds Ratio = 4.4 to 44.4) and establishment status (Odds Ratio = 2.78 to 694.9) play a large role in influencing the decision of funding strategies. Thus, financial reasons become statistically insignificant at this stage. The Odds Ratio is the likelihood of an entrepreneur to choosing a certain strategy of funding over no choice. These findings indicate that in well-developed and growth-oriented companies, external pressures and maturity are very influential in determining funding.
38. The results of the Multinomial Logit Model indicate a strong fit (Pseudo $R^2 = 0.76$), and the Likelihood Ratio Chi-square test ($\chi^2 = 699.01$, $p < 0.001$) confirmed the overall significance. Consequently, the Null hypothesis (H_0) is rejected and the alternative hypothesis (H_1), stating that there is a significant relationship between the choice of selecting funding strategies and the factors influencing it, is accepted. This indicates that variables such as Awareness and knowledge of available funding options, Financial considerations and the cost of capital, Risk tolerance and control over business operations, Accessibility and availability of funding sources, Impact on business growth and sustainability and External influences and strategic considerations strongly shape the decisions of Start-up owners on their choices of selecting funding strategies.

5.6.3 Objective 3: To Study the Level of Satisfaction of Entrepreneurs Towards Start-up Finance

The key factors that influence the level of satisfaction of entrepreneurs towards Start-up finance were identified as:

- Variability of funding options
- Ease of access to finance
- Cost and affordability of funding
- Government policy and support
- The impact of funding on business growth

The study used the Ordered Multinomial Logit Model to analyse the degree of satisfaction of the entrepreneurs towards Start-up finance. The model estimates the influence of significant factors on satisfaction with Start-up finance. The cut points (Cut 1 to Cut 4) are the estimated values of the cut point between the adjacent categories of satisfaction, with the lowest category being normalised to zero, thus, providing model identification. The Odds Ratios were calculated as exponentiations of the estimated coefficients in order to make them easy to interpret. The Odds Ratio of more than 1 will mean that when the respective variable increases, the probability of the entrepreneur reporting a higher level of satisfaction also increases, whereas the Odds Ratio of less than 1 will denote the lower level of satisfaction. The analysis using Odds Ratios gives a better perspective of the strength and direction of the relationship between funding strategy determinants and satisfaction of entrepreneurs with the Start-up finance. The major findings related to the level of satisfaction of entrepreneurs towards Start-up Finance are given below.

39. The level of satisfaction of the Entrepreneurs towards Start-up finance, assessed by using a 5-point Likert scale (1-Minimum) and (5-maximum) indicated that the Entrepreneurs were moderately satisfied on average (Mean score = 3.05).
40. The variability of funding options is the highest with a score of 15.85 on the average scale, which indicates that the entrepreneur has a moderate to high source of financing.
41. Regarding ease of access to finance it is established that funding is usually quite accessible to entrepreneurs but there is significant variation and this implies that not all entrepreneurs have the same access of this funding. It is confirmed in the average mean score 15.46.
42. Diverse experiences were reflected in the cost and affordability of funding (Mean = 15.21). Therefore, it can be stated that cost and affordability of funding were burdensome and at the same time affordable to entrepreneurs.

43. The rating of government policy and support provided to the entrepreneurs was low. It means that the confidence of the entrepreneurs regarding the effectiveness of Government policy and support is lower (Mean = 14.36).
44. The strongest positive relationship was perceived between the availability of funding options and satisfaction ($r = 0.7212$).
45. The level of satisfaction is positively related to the growth of business based on the extent of funding ($r = 0.6712$). This fact supports that finance that enables growth increases the satisfaction of entrepreneurs.
46. Satisfaction, affordability and growth are moderately associated with ease of access to finance ($r = 0.4121$).
47. The range of funding options is the most important aspect, (Odds Ratio – 2.72). It means that there is a chance of entrepreneurs being more satisfied, going by 172% for each increase in the variety of options.
48. The Odds Ratio was 1.0128 and this means that, when there is a one-unit rise in the ease of accessibility to finance, the probability of the satisfaction of entrepreneurs will rise by 1.28%.
49. The cost and affordability of funding Odds Ratio is 1.6594 and it means that there is a 66 percent increase in the probability of increased satisfaction of the entrepreneur with every increase in affordability.
50. The Government policy and support has an Odds Ratio of 1.0059, indicating that the slightest improvement has a tendency to lead to the increased likelihood of entrepreneurs being more satisfied.
51. The Odds Ratio of the impact of funding on the growth of the businesses is 1.0875, meaning that the probability of the entrepreneurs being satisfied with 8.8 percent for each increment in the favourable impact. The findings indicate that accessibility of diversified funding sources, affordability of finance, government policy and support, availability of finance at ease and the effect of funding on the business growth are all significant variables that affect the satisfaction of

entrepreneurs with Start-up finance. This suggests that the improvements in the spheres will contribute greatly to the overall satisfaction level among the entrepreneurs in relation to Start-up financing.

52. The Ordered Multinomial Logit Model showed a strong overall fit ($\chi^2 = 690.58$, $p < 0.01$, Pseudo $R^2 = 0.7121$). Hence, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1), the satisfaction of entrepreneurs towards Start-up finance is significantly related to the variability of funding options, ease of access to finance, cost and affordability of funding, government policy and support and the impact of funding on business growth is accepted. Which suggests that the independent variables, together, contribute to a significant amount of the variation in satisfaction levels.

5.6.4 Objective - 4 - To Analyse the Multifaceted Risk of Availing Start-up Funding in Kerala.

The key factors that influence the multifaceted risks of availing Start-up funding in Kerala were identified as:

- Financial Risks
- Regulatory and Compliance Risks
- Market and Economic Risks
- Investor and Lender Risks
- Operational and Management Risks

Entrepreneurs of Start-ups are exposed to many types of risks associated with Start-up funding. The five significant categories of funding risks determined are Financial risks, Regulatory and Compliance Risks, Market and Economic risks, Investor and Lender risks and Operational and Management risks. A five-point Likert scale is used to evaluate the perception of the entrepreneurs regarding risks associated with different types of Start-up funding. The value on each dimension was derived by summing the values on the Likert scale to get data on each dimension. One-way ANOVA and Post Hoc Analysis are used to analyse the opinion of the entrepreneurs regarding the risk and challenges involved in Start-up funding.

The key findings regarding multifaceted risks of availing Start-up funding in Kerala are given below.

53. The entrepreneurs vary significantly in their opinions regarding Financial risks, Regulatory and Compliance risks, Market and Economic risks, Investor and Lender risks and Operational and Management risks ($F = 1524.662$, $p = 0.000$). The result of the one-way ANOVA analysis confirms it.
54. Financial difficulties are considered to be the most critical risk ($M = 17.24$) followed by market and economic risks ($M = 15.70$) and investor and lender risks ($M = 12.94$). It was proven by Tukey Post Hoc analysis.
55. Regulatory and compliance risks were less serious to Start-up entrepreneurs ($M = 9.32$).
56. The perceived risk of the market and economic risks are greater compared to investor and lender risks, operational and management risks and all other risks. This indicates that the entrepreneurs are highly sensitive to market dynamics and economic turmoil.
57. The entrepreneurs are moderately concerned with the expectations of investors and lender expectations and this is seen by the fact that investor and lender risks are significantly higher than the operational and management risks (mean difference = 3.469, $p = 0.000$).
58. The Regulatory and Compliance Risks are very high when compared to Market and Economic Risks, Investor and Lender Risks and Operational and Management Risks. However, in the instance of Operational and Management Risks, it is not significantly different. It means that regulatory risks are viewed on the same level as operational risks.
59. The least perceived risk is the operation and management risk. It indicates that the entrepreneurs tend to perceive operational issues as being quite easy to manage.
60. The Start-up entrepreneurs consider that there exist substantial variations in the extent of different Start-up risks.

61. The one-way ANOVA results reveal that a statistically significant difference ($F = 1524.662$, $p < 0.001$) in entrepreneurs' perceptions of different types of risks associated with Start-up funding in Kerala. Accordingly, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1), there is a significant difference in the perception of entrepreneurs about financial, regulatory compliance, market economic, investor and lender, operational and management risks associated with Start-ups is accepted. This confirms that entrepreneurs perceive these categories of Start-up funding risks differently.

5.7 CONCLUSION

The study on funding strategies of Start-ups in Kerala shows that the state has a vibrant entrepreneurial ecosystem with government support, incubation centers and helpful policies. However, challenges like difficulty in accessing funds, inadequate financing, and delays still exist. Entrepreneurs see funding as important not just for running their business but also for growth, innovation and staying competitive. Many Start-ups find it hard to choose from the variety of funding options available such as government grants, venture capital, angel investors and loans. There is still a big gap in financing for growth, which is needed to scale up and enter new markets. The findings highlight that although seed funding and incubation support have enabled idea validation, there remains a significant gap in the growth-stage financing, where the need for larger capital becomes critical for scaling operations and entering new markets.

The study concludes that the Start-up ecosystem of Kerala faces obstacles like low awareness, complicated procedures and dispersed funding access, even though it is promising and supported by policies. Flexible financing options, simplified application procedures and improved financial advice are necessary for the long-term growth. A more dependable funding environment will result from improved cooperation between the government, financial institutions and owners. By addressing these problems, Kerala can become a more powerful hub for Start-ups by encouraging innovation and increasing employment opportunities through regional developments.

Chapter 6

RECOMMENDATIONS, IMPLICATIONS AND SCOPE FOR FURTHER RESEARCH

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6.1 INTRODUCTION

This chapter brings in the practical outcomes based on the research findings and conclusions. It aims to bridge the gap between the theory and practical implications by providing specific recommendations to key stakeholders, such as the Government of Kerala, the Kerala Start-up Mission (KSUM), investors and Start-up founders. Theoretical and practical implications of the study are also brought out in this chapter and emphasise its relevance to entrepreneurship, finance and regional innovation systems. The chapter also brings to light the areas where additional scholarly inquiry can be conducted to enhance the understanding of the dynamics of financing of Start-ups within the evolving entrepreneurial ecosystem of Kerala.

6.2 RECOMMENDATIONS

The important recommendations of the study are categorised under three heads. (1) Recommendations to the Government of Kerala (2) Recommendations to Kerala Start-up mission (3 Recommendations to Start-up founders (4) Recommendations to investors.

6.2.1 Recommendations to the Government of Kerala

1. Establishment of larger state- baked seed funds specifically designed to support early-stage ventures can be accompanied by simplified application procedures. This would be helpful to Start-ups in the earlier stages, so they can access the necessary capital without having to contend with the unnecessary bureaucratic limitations.
2. It is necessary to implement special fiscal incentives to individuals and corporate investors registered in Kerala. These would be beneficial to increase the

involvement of the institutional investors of the private sector in the entrepreneurship funding environment in Kerala.

3. To establish a comprehensive single-window clearance mechanism for all statutory registrations, licenses and approvals to Start-ups. This would greatly decrease the ordeal in the procedures and compliance expenses, creating a more favourable environment for the business during the establishment and growth phase.
4. The state of Kerala can also consider the use of preferential procurement, such as requiring a certain percentage of government contracts to be given to Start-ups that meet the qualifications, particularly in strategic areas of government, such as health technology, agricultural technology and renewable energy solutions.
5. The Government of Kerala can also come up with a credit guarantee scheme to enable banks and Non-Banking Financial companies (NBFCs) to issue money to Start-up businesses. Such a framework would reduce the risk of the lender and increase access to debt financing for Start-ups that have no or limited collateral.
6. Financial assistance to access co-working spaces, innovation labs and manufacturing facilities, especially in the rural and semi-urban areas, would encourage decentralised entrepreneurship and eliminate barriers to entry based on infrastructure aspects.
7. To increase financing opportunities, the state government may take the initiative to match local Start-ups with the programs of the government, such as Start-up India Seed Fund Scheme and Credit Guarantee Fund Trust of Micro and Small Entrepreneurs (CGTMSE).
8. Specific grants can be provided for Research and Development (R&D) in areas such as Biotechnology, Renewable energy and Artificial Intelligence. This would stimulate the spread of knowledge-based businesses that have high levels of innovativeness.

9. Financial help and subsidies offered by the Government of Kerala to the Start-ups participating in international trade fairs and business delegations, as well as cross-border e-commerce platforms, enabled them to reach the global market. Such actions would make the Kerala entrepreneurial ecosystem more competitive in the world arena.
10. The Government should ensure sustainable start-up development, where funding is made affordable and accessible and that there may be risk-sharing as well as preserving long term policies that favour Start-ups even after the early growth stages.

6.2.2 Recommendations to Kerala Start-up Mission (KSUM).

1. The accelerator programs of KSUM, focused on the strategically important areas like agricultural technology, medical technology, tourism technology and financial technology, can be customised to meet the sector-specific funding needs, market access issues and regulatory aspects.
2. It is possible to institutionalise frequent investor Start-up engagement practices in KSUM that include Investment summits, Curated pitch events and Virtual demonstration sessions. These efforts would be useful in providing orderly networking programs through connecting Kerala-based Start-ups to networks of angel investors, venture capital funds and corporate investment funds.
3. The KSUM can adopt formalised follow-on funding programmes to the entrepreneurs who previously benefited from the Innovation Grant. This may guarantee long term expansion of Start-up businesses.
4. The mission can increase and strengthen its collaboration with international Start-up hubs, venture funds and innovation ecosystems. These joint ventures would help in accessing cross-border funding, international mentorship and placement into global value chains.
5. An official support system can be established to direct Start-ups to utilise the regulated crowdfunding sites to their advantage. This can involve legal

compliance advice, promotion and support during the choice of suitable funding platforms.

6. The updated database maintained by the KSUM about funding opportunities, investor profiles, grant schemes and financial institutions can be availed to all registered Start-ups to help enhance the efficiency of funding and application efficiency.
7. The KSUM can also work out mentorship initiatives where Start-ups are matched with experienced industry and investment experts. Such mentors might optimise business models, reinforce investment proposals and prepare founders to due diligence procedures.
8. The KSUM can also pilot and promote revenue-based financing plans in partnership with financial institutions. This model would allow Start-ups to repay funding at a ratio of their revenues, hence reducing the equity dilution and retaining the control of the founders.
9. The KSUM can proactively apply its funds and incubation programs to rural innovators especially in traditional industries that are changing technology. This would facilitate inclusive business and even development among the regions in the state.
10. The KSUM should also improve sustainability through promoting blended financing schemes, and enabling investor-government co-funding platforms and avenues of providing ongoing mentorship that assists Start-ups to navigate financial risks and become viable in the long-term.

6.2.3 Recommendations to the Start-up Owners.

1. The Start-up entrepreneurs can conduct a systematic estimation of the short-term and long-term capital requirements. This can be achieved through the strategic combination of equity, debt and grant-based sources so as to maximise the total capital structure and reduce financial risk.

2. The Start-up entrepreneurs may be motivated to participate proactively in Start-up-oriented events, industry conferences and investor forums. This would also be useful to widen the range of professional contacts, share the knowledge and provide direct access to financing opportunities.
3. Constant performance updates, openness of reporting and strategy implementation are necessary to ensure greater investor confidence and commitment. This will be achieved through the creation and sustenance of orderly communication lines to the existing and prospective investors.
4. The owners of Start-ups can be persuaded to make high-quality, concise and data-driven investment pitches with the help of strong market research, realistic financial forecasts and well-explained scaled plans.
5. Innovations of entrepreneurs can be safeguarded by means of taking patents, trademarks and copyrights. These measures not only protect the competitive advantages but also lead to an increase in the valuation during funding negotiations.
6. Resource utilisation and reduction of unnecessary expenditure can help to make Start-ups operational efficiency. This could help in the expansion of the financial runway between funding rounds.
7. The Start-up owners can able to predict and plan for investor due diligence by making sure that all legal, financial and operational requirements are met long before the start of any funding discussions.
8. The owners of Start-ups are in a position to prepare all the legal, financial and operational documents and approach investors to accelerate financing.
9. The owners of the Start-ups should adopt balanced funding models which incorporate equity, debt and other sources of funds whilst upholding financial discipline and transparency to enhance investor confidence and long term sustainability.

6.2.4 Recommendations to the Investors

1. The Start-up Investors can be encouraged to allocate their available resources across multiple high-potential domains within Kerala, including renewable energy, tourism technology and health innovation.
2. A long gestation period may be offered to the Start-ups that are in the research-intensive and long-cycle industries like biotechnology and deep technology thus giving them ample time to develop the product, validate it and enter the market.
3. Apart from providing capital, investors may be encouraged to offer strategic mentorship, market channel access and industry connections.
4. Greater emphasis can be placed on seed and pre-seed stage funding, particularly given the high-impact potential of early-stage enterprises within the evolving entrepreneurial ecosystem of Kerala.
5. Investors are free to engage in organised co-funding schemes with the state-led financial programs, such as those aided by Kerala Start-up Mission, to reduce the risk of investment and to maximise mobilisation of resources.
6. A portion of the investment portfolio may be invested strategically in social enterprises and sustainable innovation projects that contribute to the developmental needs of Kerala, thus creating both financial and quantifiable social returns.
7. To create diversity and improve inclusivity as well as to exploit untapped potential innovation, investors can actively identify and invest in women-led Start-ups.
8. Establishment of strict post-investment monitoring systems can guarantee the maximum use of funds, allowing correction of the course and enhancing the orientation of founder investors.
9. The Training, incubator funding and Start-up competitions can make the Start-up ecosystem of Kerala more vibrant, sustainable and competitive at the global stage.

10. The investors should concentrate on providing long term-capital aligned with the innovation-based ventures and join the efforts of the state-led initiatives to minimise the risk and facilitate sustainable growth of Start-ups.

6.3 IMPLICATIONS

This section indicates the theoretical and practical implications of the study. The practical implications for the stakeholders, such as the Start-up owners, government, policy-makers, the funding organisations and potential entrepreneurs are outlined below.

6.3.1 Theoretical Implications

The findings and the recommendations of this study may contribute to the theoretical discussion of entrepreneurial finance, regional systems of innovation and institutional support frameworks. This study extends the use of the current theories of entrepreneurship and finance by placing them in the context of a state-based ecosystem with a unique socio-economic, infrastructural and policy context. The theoretical contribution of this study lies in bringing a clear and comprehensive insight into Start-ups and their management of funding in the emerging regional economies. The present study links Kerala state's entrepreneurial funding ecosystem to the practical realities of the entrepreneurial funding ecosystem of Kerala.

6.3.2 Practical Implications

The major implications to the different stakeholders in the Stat-up ecosystem are given under four heads.

6.3.2.1 Implication on the Government of Kerala

The findings of this research highlight the need to be more active and integrated approach to encourage the Start-up financing of the Government of Kerala. Practical solutions like increasing state-supported seed funds and the introduction of special tax incentives, streamlining of regulatory procedures and credit guarantee mechanisms will go a long way in reducing the capital access obstacles, especially among early-stage Start-ups. The state can be capable of enhancing investor confidence by

cultivating an optimum regulatory environment and harmonising the financing programs. This approach can encourage greater private sector participation and help to position Kerala as a competitive Start-up hub at both the regional and national levels.

6.3.2.2 Implications to the Kerala Start-up Mission (KSUM)

The study highlights the importance of improving the role of KSUM in assisting Start-ups in identifying investors and equipping the entrepreneurs to pursue the right funding strategy. Different Start-ups at different levels of development can be assisted by creating industry-focused accelerators, establishing sector-specific partnerships and creating systematic follow-up financing frameworks. The KSUM can also enhance its effectiveness by having a central funding database, investment-ready mentorship and promotion of alternative funding sources.

6.3.2.3 Implication to the Start-up Owners

The study has direct practical implications on the Start-up owners, through the recommendation of strategic financial planning, operational efficiency and investor relationship management. It is possible to persuade the owners of Start-ups to implement comprehensive funding strategies that are a combination of equity and debt and grant sources through the transparency of their financials to establish trust among investors. The proactive participation in the networking opportunities, effective intellectual property portfolios and proper preparations towards due diligence would assist in enhancing the success rates of funding. Through proper implementation of these practices, the owners can not only be able to boost their prospects of acquiring capital but also maintain sustainable business growth in the highly competitive markets.

6.3.2.4 Implications for Investors

Kerala Start-ups provide favourable opportunities to investors in terms of making profits and enhancing the entrepreneurial ecosystem of the state. Investors can be able to contribute long-term funds to research-based projects, besides being able to help Start-ups in diversifying their business operations to new markets. Thus, investors can

be in a position to improve their performance through investing in different high-potential industries. The long-term value can be obtained by collaborating with KSUM and the government and supporting women-owned businesses.

6.4 SCOPE FOR FURTHER RESEARCH

From the theoretical and practical knowledge gained from the study, the following topics are suggested for further research

1. Variations in Funding and Support systems of Start-ups - A comparative study of Kerala and selected other states in India.
2. The Impact of funding sources on the long-term survival, expansion and profitability of Start-ups in Kerala.
3. The role of informal funding sources in the performance of early stage Start-ups in Kerala.
4. The influence of environmental, social and governance (ESG) principles in investor choices and Start-up funding strategies in Kerala.

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APPENDIX

Start-up Funding Landscape in Kerala: Entrepreneurs' Funding Strategies, Satisfaction and Risk Concerns

I am Jobin George, a Research Scholar at Government College, Kodanchery. As part of my research, I am studying the choice of selecting funding strategies in Start-ups, the satisfaction of entrepreneurs towards Start-up finance and the multifaceted risks associated with availing Start-up finance in Kerala. Your insights and experiences are invaluable in understanding the financial landscape of Start-ups in Kerala. I kindly request your participation in this questionnaire, which aims to gather data for academic purposes only. All responses will be kept strictly confidential and used solely for research purposes. Your time and input are highly appreciated and your participation will contribute significantly to this study. Kindly spend your valuable minutes to answering these questions.

1. Start-up Profile

- a) Name of the Start-up:
- b) Industry/Sector:
- c) Year of Establishment:
- d) Business Stage: ☐ Early-stage ☐ Growth-stage ☐ Established
(✓mark on appropriate)

2. Entrepreneur Details

- a) Name of the Founder/Co-founder (*Optional*):
- b) Age and Educational Background:
- c) Experience in Entrepreneurship :(First-time entrepreneur or serial entrepreneur)
- d) Source of funding: ☐ Own fund ☐ Debt fund
☐ Venture Capital ☐ Angel Fund
☐ Crowdfund (✓mark on appropriate)

(5 = Strongly Agree, 4 = Agree, 3 = Neither Agree nor Disagree,
2 = Disagree, 1 = Strongly disagree)

<i>Awareness and Knowledge of Funding Options:</i>	5	4	3	2	1
a) I am well-informed about startup funding sources (equity, debt, grants, etc.)					
b) I actively research and compare various funding options before making a decision.					
c) I understand the long-term implications of each funding strategy on my business.					
d) Before choosing a funding strategy, I seek professional advice (financial advisors, mentors, etc.).					
e) I am confident in selecting my Start-up's most suitable funding strategy.					
<i>Financial Considerations and Cost of Capital</i>	5	4	3	2	1
a) Interest rates and repayment terms significantly influence my funding decision.					
b) I prefer funding options that have lower financial burdens in the long run.					
c) I assess the return on investment before deciding on a funding source.					
d) I consider equity dilution when choosing between debt and equity financing.					
e) Tax implications of different funding strategies play a crucial role in my selection process.					
<i>Risk tolerance and control over business</i>	5	4	3	2	1
a) I prefer funding options that allow me to retain full ownership and decision-making power.					
b) I am comfortable with taking financial risks in exchange for faster growth opportunities.					
c) The level of risk associated with external funding affects my choice of funding strategy.					
d) I am willing to share business control with investors if it results in better financial support.					

e) The potential loss of control over my startup discourages me from choosing equity financing.					
<i>Accessibility and Availability of Funding Sources</i>	5	4	3	2	1
a) I choose funding strategies based on how easily I can access them.					
b) I prefer funding sources that provide quick disbursement of funds.					
c) Government funding schemes and grants are important in my funding decision.					
d) I consider the availability of multiple funding options before finalising my choice.					
e) The ease of application and approval process influences my preference for a funding source					
<i>Impact on Business Growth and Sustainability</i>	5	4	3	2	1
a) I select funding options that support long-term business sustainability.					
b) The funding strategy helps in scaling my business and influences my funding strategy.					
c) I prioritise funding for innovation and research in my business.					
d) I evaluate whether the funding option aligns with my Start-up's financial goals.					
e) I believe the right funding strategy enhances my Start-up's competitiveness in the market.					
<i>External Influences and Strategic Considerations</i>	5	4	3	2	1
a) The success stories of other startups influence my funding choices.					
b) Market conditions and economic trends impact my selection of funding strategies.					
c) Investor preferences and industry expectations affect my funding decisions.					
d) Government policies and regulatory requirements influence my funding strategy choices.					

e) Advice and recommendations from mentors, incubators, or industry experts influence my funding decisions.					
<i>Ease of Access to Finance</i>	5	4	3	2	1
a) The process of obtaining Start-up finance is simple and transparent.					
b) The eligibility criteria for Start-up funding are reasonable and entrepreneur-friendly.					
c) Digital platforms and online applications have improved access to funding.					
d) Start-ups in all industries can access financial support without bias.					
e) The time taken for loan or investment approval is satisfactory.					
<i>Cost and Affordability of Funding</i>	5	4	3	2	1
a) The interest rates on loans for Start-ups are affordable.					
b) The collateral requirements for securing funding are reasonable.					
c) The repayment terms of Start-up loans are flexible and suitable for entrepreneurs.					
d) The hidden costs and processing fees associated with funding are minimal.					
e) Overall, the cost of acquiring funds is justified by the benefits received.					
<i>Government and Policy Support</i>	5	4	3	2	1
a) Government policies encourage and facilitate Start-up financing in Kerala.					
b) Subsidies and incentives the government provides help reduce the financial burden on Start-ups.					
c) The Start-up funding schemes by the government are easy to access and utilise.					

d) The regulatory environment in Kerala is favourable for new businesses seeking finance.					
e) The government actively promotes awareness and outreach about available Start-up funding schemes.					
<i>Impact of Funding on Business Growth</i>	5	4	3	2	1
a) The funding received has significantly contributed to the growth of my Start-up.					
b) Access to finance has helped in scaling business operations effectively.					
c) Funding has improved my Start-up's ability to innovate and compete.					
d) Overall, the funding options available in Kerala have positively impacted the success of Start-ups.					
e) Our company is satisfied with the financial support and funding options available to us.					
<i>Financial Risks</i>	5	4	3	2	1
a) The high interest rates on loans make it difficult for Start-ups to sustain themselves.					
b) The repayment terms and conditions of loans are not favourable for new businesses.					
c) Over-reliance on external funding poses a significant risk to business sustainability.					
d) Limited availability of affordable credit options increases the financial vulnerability of Start-ups.					
<i>Regulatory and Compliance Risks</i>	5	4	3	2	1
a) The regulatory framework for Start-up funding in Kerala is complex and difficult to navigate.					
b) Government policies on Start-up financing frequently change, creating uncertainty.					
c) Bureaucratic delays in government funding schemes affect business operations.					
d) Compliance costs, such as legal fees and registration charges, place an additional burden on Start-ups.					

<i>Market and Economic Risks</i>	5	4	3	2	1
a) Economic fluctuations impact the availability and accessibility of funding for Start-ups.					
b) Market saturation makes it difficult for Start-ups to attract investors.					
c) Changing consumer preferences affect the profitability of Start-ups, making funding risky.					
d) A lack of investor confidence due to economic instability hampers Start-up growth.					
<i>Investor and Lender Risks</i>	5	4	3	2	1
a) Investors often withdraw support due to changing market conditions.					
b) The expectations of investors and lenders are often unrealistic for early-stage Start-ups.					
c) Start-ups face difficulty in securing follow-up funding from existing investors.					
d) A lack of trust between investors and entrepreneurs affects funding opportunities.					
<i>Operational and Management Risks</i>	5	4	3	2	1
a) Poor financial planning leads to inefficient utilisation of funding.					
b) Entrepreneurs lack sufficient financial literacy to manage funds effectively.					
c) Over-reliance on a single funding source creates financial instability.					
d) Inadequate risk management strategies result in financial mismanagement.					

Any other suggestions:

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Thank You