

# **Innovation And Entrepreneurship In India - A Study Of Telangana Government (T Hub)**

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## **Abstract**

*India is focusing on skills and knowledge-driven economic growth for social development through initiatives like the International Centre for Technical and Vocational Education and Training, the Indian Institute of Entrepreneurship, and the National Skill Development Corporation. These initiatives aim to create a skilled workforce, promote innovation-based entrepreneurship, and enhance productivity for economic growth. Innovation is being promoted in educational institutions through initiatives like the Smart India Hackathon and Innovation Cells. Telangana, India's youngest startup state, has a thriving ecosystem with initiatives like the Government Mentor Program and entities like TSIC, T-Hub, WE-Hub, and T-Works. The government focuses on emerging technologies like AI and cybersecurity, fostering inclusivity through partnerships. T-Hub, a leading innovation ecosystem, nurtures startups, facilitates partnerships, and drives global connections for Indian entrepreneurs. It provides funding, supports seed-stage startups, accelerates product development, and fuels corporate innovation. T-Hub has played a significant role in shaping the entrepreneurial landscape and fostering a culture of innovation in Telangana, receiving recognition for its contributions.*

**Keywords:** *Entrepreneurship, Innovation, Startups, T-Hub, Sustainable Development Goals, infrastructure, Skill Development, Ecosystem, Incubation, Scaleup*

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## **I. Introduction**

Skills and knowledge are crucial for economic growth and social development, as they contribute to generating ideas and implementing them effectively. A nation's wealth is defined by its assets, including natural and human resources. Human resource management is a key challenge for leaders. Innovation involves developing new ideas or products that leverage different methods, materials, applications, or business systems. Educational institutions play a vital role in fostering critical thinking and knowledge for various aspects of development. Entrepreneurship education focuses on instilling an entrepreneurial mindset and skills to transform creative ideas into action, promoting flexible learning methods and experiential approaches. Sustainable growth involves industrialization that makes opportunities accessible to all, supported by innovation and resilient infrastructure. Entrepreneurial skills are essential for addressing social, economic, and environmental aspects of sustainability and preparing individuals for the rapidly changing global landscape.

Innovation is the use of innovative ideas or products to improve livelihoods, processes, lifestyles, health, education, and general welfare. Social innovation is explored globally for its potential to bring about social transformation. Entrepreneurship education focuses on cultivating an entrepreneurial mindset and developing skills to turn creative ideas into action. Educational institutions play a vital role in stimulating critical thinking and generating knowledge for social, cultural, ecological, and economic development. Entrepreneurial learning is a shift from traditional instruction to an experiential approach, focusing on action, problem-based learning, mentoring, and group-work. This approach is crucial for future generations to cope with the growing youth population, rising unemployment, and changes in the labor market. The UN Sustainable Development Goals 4, 8, and 9 focus on education, employment promotion, infrastructure development, inclusive industrialization, innovation, and entrepreneurship mindset to promote sustainable development. The impact of an entrepreneurial mindset on social structures, environmental preservation, and long-term economic sustainability is significantly influenced by production patterns, sustainable consumption, and proper use of natural resources. Education should foster entrepreneurial skills like creativity, expertise, responsibility, risk-taking, problem-solving, and teamwork. Entrepreneurial education bridges the gap between academic knowledge and societal needs, fostering socially conscious entrepreneurs, strengthening communities, and generating long-term employment opportunities.

UNESCO's TVET programs aim to facilitate the transition between education and work by developing skills like problem-solving, critical thinking, creativity, teamwork, communication, and conflict resolution. The

OECD collaborates with countries to develop policies for economic growth and resilience, focusing on institutional and regulatory frameworks, access to finance, skills, innovation assets, and knowledge networks. The Asia-Pacific region faces challenges in employment, technological innovation, and industrial upgrading due to infrastructure and institutional bottlenecks. Policy interventions, such as research enhancement, support for start-ups, and digital technology integration, are crucial for growth and development.

The Indian government aims to create a skilled workforce, promote innovation-based entrepreneurship, and enhance overall productivity for sustainable economic growth. Programs like Smart India Hackathon and Innovation Cells in educational institutions are driving a culture of innovation and entrepreneurship among students and faculty. Telangana state government's initiatives include the Government Mentor Program to build familiarity with officials, while events and enablers like T-Hub and TSIC facilitate entrepreneurship. They are also prioritizing emerging technologies like AI and cybersecurity, fostering inclusivity through UNICEF India partnerships. The state also focuses on IoT, Health Tech, and sustainability, offering incentives for startups and incubators.

## **II. Innovation And Entrepreneurship In India**

India, a young nation with a 140-crore population, is striving to become a global knowledge economy. To meet the rising aspirations of its youth, the country has established several organizations and schemes to provide employable skills. The UNESCO International Centre for Technical and Vocational Education and Training focuses on sustainability and identifying in-demand green skills for enhanced employability. The Indian Institute of Entrepreneurship (IIE 1979) serves as the National Apex body for Entrepreneurship Development through Training, Research, and Consultancy Services. The National Skill Development Corporation (NSDC) 2009 is a public-private partnership initiative aiming to create occupational standards, develop competency frameworks, conduct skill gap studies, and assess and certify trainees. The Ministry for Skill Development and Entrepreneurship (MSDE) was established in 2014 to create an ecosystem for imparting employable skills to the growing workforce. The Indian government has prioritized TVET through the National Policy for Skills Development & Entrepreneurship (2015) and the National Education Policy 2020, aiming to create an education system contributing to India's sustainable transformation into a vibrant knowledge-based society. The MSDE's Vision Statement 2025 aims to unlock human capital, stimulate productivity, and provide employment and entrepreneurship opportunities. The National Credit Framework (NCrF) under NEP 2020 encourages AI education and skill-based assessments, collaborating with businesses and universities to develop apprenticeship programs and on-the-job training opportunities, while social enterprises use socially-oriented innovations to combat poverty and unemployment.

## **III. Innovation In Telangana State Traditionally**

Telangana's entrepreneurial society, rooted in Hyderabad's trade routes and cultural heritage, has nurtured large enterprises in IT, Pharma, and infrastructure sectors, showcasing the city's rich entrepreneurial history. The Telangana State Innovation Cell (TSIC) is a government initiative established in 2017 aimed at promoting innovation and entrepreneurship, especially among students, across all societal levels in the state. The state has established numerous eco-system enablers such as TSIC, T-Spark, T-Hub, WE-Hub, T-Works, Emerging Technologies, RICH, Y-Hub and TASK to support startups from ideation to commercialization. TSIC is driven by three mandates aims to foster an innovation culture from school age, promote innovation within government and administration, and create an environment conducive to innovation, experimentation, risk-taking, and entrepreneurship across all societal levels. Telangana provides grants to support startups from ideation to commercialization, focusing on prototype building, talent development, R&D, and marketing efforts, beyond fundraising.

## **IV. Innovation Policy Of Telangana State**

The Innovation Policy of the Government of Telangana, issued in 2017, aims to promote innovation and entrepreneurship in the state, focusing on sectors like IoT, Agri-tech, Health Tech, Sustainability, and FinTech. The Industrial Policy Framework, "Innovate, Incubate, Incorporate," aims to stimulate the state's industries through innovation and technology. The policy has five Pillars: Physical Infrastructure & Program Management, Funding Models & Capital, Human Capital, Engagement with Industry, Rural and Social Enterprises, and Incentives. Incentives for startups and incubators include reimbursement of SGST, patent filing costs, recruitment assistance, and performance-related grants. Non-fiscal incentives include permission to file self-certifications, general permission for 3-shift operations with women working at night, and employee safety and security precautions. The policy aims to establish Telangana as the most preferred technology investment destination by fostering a strong entrepreneurial ecosystem. The Telangana State Industrial Project Approval and Self-Certification System (TS-iPASS) Act, 2014 streamlines the processing of applications for various clearances for setting up industries, creating an investor-friendly environment.

## **V. Innovation And Entrepreneurship Initiatives In Telangana State**

Telangana, India's youngest state, established in 2014, contributes over \$140 billion to the country's GDP. Its unique startup ecosystem model fosters an innovation-driven economy, nurturing innovators, researchers, startups, and entrepreneurs, thereby making it a technology-driven state.

The Telangana State Innovation Cell (TSIC) offers various programs and initiatives to support student entrepreneurs and promote innovation in the state. These programs are conducted by the TSIC in collaboration with various organizations, including WE-Hub, Ag-Hub, T-Hub, T-AIM, and J-Hub. Youth for Social Impact (YFSI) is an innovation hub in collaboration with UNICEF India and YuWaah, aiming to enhance problem-solving skills and challenge perspectives. TSIC has entered into MoUs with Professor Jayashankar Telangana State Agricultural University's Agri Innovation Hub (Ag-Hub) to offer technical support to grassroots entrepreneurs and students. TSIC has also entered into MoUs with Bala Vikasa International Center (BVIC) to provide incubation support for startups. The "Innovate 4 Menstrual Waste Hackathon" 2022, organized by WaterAid and the TSIC, aims to find safe, eco-friendly solutions for treating and disposing of used menstrual absorbents.

Entrepreneurship Development Cells (EDCs) in Telangana are instrumental in fostering entrepreneurship and innovation by organizing events, programs, and courses to help students and faculty develop their skills. They conduct research, provide mentoring, host guest lectures, and host seminars to promote entrepreneurship. EDCs also facilitate idea generation, evaluation of opportunities, and business model development. The Telangana Academy for Skill and Knowledge (TASK) is a non-profit organization that promotes collaboration among government, industry, and academia institutions. It offers subsidized modules for enhancing technology, personal, and organizational skills, and partners with colleges to foster growth. WE-Hub, the first organization for women entrepreneurs in Telangana, promotes women's entrepreneurship through incubation, access to government resources, and a collaborative ecosystem. The WE Alpha program, tailored for students aged 17-21, offers an 8-week journey to transform an idea into a concrete proof of concept, enabling individuals from diverse socio-economic backgrounds to transition from job seekers to job creators. T Spark is a top IT provider that offers AWS cloud infrastructure, data science solutions, and AI for marketing and sales. They help clients improve planning and procurement activities, manage core data and business processes using SAP Chatbots on Microsoft Teams, and provide a unified communication and collaboration platform.

T-Works, a government initiative in Telangana, offers prototyping services in various fields such as metalworking, woodworking, ceramics, 3D printing, laser cutting, and electronics testing. The facility plans to expand capabilities to multilayer PCB fabrication, plastics and composites, high-speed CNC machining, and digital cutting technologies. T-Works has launched the Solution Seekers platform, which manages queries from makers, innovators, startups, and businesses. The Rural Innovators Development Programme, collaborations and partnerships platform, and solutions seekers platform support grassroots innovators and artists. T-Works has also launched India's first private rocket, Vikram S, and developed a hybrid VTOL UAV for the Medicine from the Sky initiative in Telangana. They also designed surgical guides for COVID-19 patients and introduced a Cinepreneur program for media and entertainment sector professionals. The Telangana State Electric Vehicle and Energy Storage Policy 2020-2030 aims to develop an ecosystem for electric vehicles and energy storage systems, addressing demand and supply gaps. It promotes clean technology, green energy open access, and renewable energy adoption.

Telangana has established itself as a central hub for Life Sciences and is recognized as India's vaccine capital, contributing approximately 33% of the global vaccine supply aimed at alleviating pain and disease worldwide. The state has developed a distinctive model for fostering a strong startup ecosystem, with a focus on promoting an innovation-driven economy. The Grassroots Innovation Framework, designed for the period from 2020 to 2025, seeks to address existing gaps and enhance the current Grassroots Innovation ecosystem, transforming it into a more robust entity. The Telangana Cloud Adoption Policy 2020 is intended to expedite e-Governance initiatives, improving the speed, scale, and quality of services delivered to citizens while achieving cost efficiency and high operational effectiveness. This aims to position the state as a leader in Emerging Technologies.

The "Intinta Innovator" campaign aims to encourage individuals to think of themselves as problem solvers. The campaign aims to change mindsets towards innovation and entrepreneurship by encouraging individuals to believe in their capability and provide the right tools and mechanisms. The policy works under three mandates: fostering a culture of innovation from school-age, within government and administration, and across the state. The Telangana Yatra initiative, which includes activation workshops, E-cells, and showcasing rural innovators, serves as the first response to identify innovators, entrepreneurs, and innovation catalysts.

## **VI. The Technology Hub (T-Hub) Of Telangana**

T-Hub, India's largest innovation ecosystem, was established in 2015 in Hyderabad as a collaboration between the government and private entities. It is a prominent incubation center in India, promoting

entrepreneurship among young individuals. It facilitates startup ecosystems and promotes innovation and entrepreneurship through partnerships with India's top academic institutions, IIT Hyderabad, ISB, and NALSAR University. T-Hub is one of the world's largest technology incubators, a ten-story facility, spans around 6 lakh sq. ft. and capable of accommodating approximately 1,000 startups and serves as a microcosm of the innovation ecosystem, encompassing startups, corporates, investors, academia, and national and international ecosystem enablers. T-Hub has integrated innovation and entrepreneurial mindset into academic curricula and empowers corporations to foster innovation within their organizations. T-Hub attracts top startups and organizations globally, collaborates with partners to help entrepreneurs launch and scale ventures, equips startups with essential entrepreneurial skills, and serves as the central agency for the government's entrepreneurship initiatives. T-Hub has facilitated access to advanced technology, talent, mentors, customers, corporations, investors, and government agencies for various national and international startups. The organization is dedicated to fostering startup innovation through extensive support and customized program frameworks.

T-Hub's innovation strategy is guided by the 6Ms (money, methodology, market access, mentoring, motivation, and manpower) and the 2Ps (partnership and policy advisors). T-Hub's flagship initiatives aim to establish crucial connections between Indian and international enterprises, provide strategic planning and expansion opportunities, and foster an engaging environment for young entrepreneurs. Corporations are encouraged to showcase their solutions through proof of concepts and pilot engagements, which serve as market validation for startup solutions and stimulate growth and scaling. T-Hub has made significant contributions to the academic sector by establishing incubation centers and training faculty members to serve as incubation managers. T-Hub operates accelerator programs for a range of government entities, including the Ministry of Defense and the Ministry of Electronics and Information Technology, and also manages accelerator initiatives for both state and international governments. T-Hub has been instrumental in guiding young entrepreneurs who may be uncertain about their paths, facilitating connections with mentors, and assisting them in developing their business model canvases.

## **VII. T-Hub International Collaborations**

The organization collaborates with global ecosystem enablers and governments, including Redberri - USA, Digital Catapult is a UK leading organization in the field of innovation, the Foreign Commonwealth and Development Office (FCDO)-UK, and La Trobe University-Australia. T-Hub and Malaysia's Beyond4 have signed a memorandum of understanding to collaborate on cross-border collaboration, investment facilitation, business expansion support, and innovation. T-Hub has partnered with Global Wales, a Welsh government-funded initiative aimed at promoting cross-border innovation and entrepreneurship. T-Bridge is an international initiative by T-Hub aimed at creating global innovation bridges for entrepreneurs. It involves mentors, corporates, startups, incubators, universities, and government organizations. T-Bridge targets Indian startups ready for global expansion and international startups seeking support in Indian and South-Asian markets. It aims to empower and enable market access for startups in different geographies, facilitating seamless entry into the Indian market. Partnerships with countries such as the United Kingdom, France, Australia, Sweden, the USA, Israel, and Turkey also promote collaborations with global universities and assist emerging regions in establishing incubation centers.

## **VIII. T-Hub Major Initiatives And Success Stories**

T-Hub has transitioned from prototyping to structured programs, supporting over 600 corporations through over 40 initiatives like Uber, HCL, Boeing, Microsoft, and Qualcomm etc. It has partnered with companies like Renault Nissan Technology, Business Centre India, Amazon Web Services (AWS), Suzuki Innovation Center, Algorand Foundation, Berkadia, and Collins Aerospace. T-Hub and AWS have selected 10 startups for the AWS-Intel Innovation Pod for the Drone-Tech Accelerator program. Over the past nine years, T-Hub has harnessed the power of innovation to transform ideas into tangible outcomes, supporting more than 2,000 entrepreneurs and nearly 600 corporations. T-Hub organizes information awareness sessions, connects startups, and builds relationships with corporate entities to support them in collaborating with industry organizations, government agencies, and private sector players. The number of regional startups has significantly increased from 400 in 2016 to around 3,000 today.

T-Hub's Lab32 program is a market readiness program designed for Minimum Viable Product Ready and Market Startups, focusing on refining Product-Market Fit and developing a robust Go-To-Market strategy. The program is dedicated to assisting seed-accelerator stage startups in achieving self-sustainability and accelerating their growth. The T-Hub introduced the second cohort of its inaugural product development initiative, RubriX, which promotes swift product development at lower costs by offering essential training, mentorship, tools, and resources to startups. It offers a holistic approach to product development, enabling entrepreneurs to succeed with modules, interventions, and tools. Their proposition is to deliver a market-dominating minimum viable product at minimal investment. The XDC Network Internet Accelerator Program, in partnership with T-

Hub, is a groundbreaking initiative supporting Web 3.0 startups in India. It offers resources, mentorship, and infrastructure to accelerate the growth of promising startups. The program aligns with the government's "Make in India" initiative and aims to drive innovation in the country's startup ecosystem. The AIC T-Hub Foundation is a partnership between Atal Innovation Mission (AIM of NITI Aayog, Govt of India) and T-Hub, aiming to promote innovation in India by supporting startups in healthcare, mobility, semiconductor, space tech and sustainability sectors to grow in a vibrant startup ecosystem.

T-Angel, a 100-day joint venture with the Telangana government executed by T-Hub, aims to assist growth-stage startups in becoming investment-ready. The program offers customized guidance, investor networks, and potential funding opportunities. T-Angel connects high-net-worth individuals, investment funds, and startup enthusiasts to explore angel investment opportunities in Telangana through T-Hub. The program aims to elevate pitches, validate growth strategies, access mentorship, deepen investment knowledge, refine storytelling with experts, and unlock potential funding opportunities. Many startups have experienced significant growth, with survival rates surpassing the industry average, and there is now a strong emphasis on cultivating an entrepreneurial mindset. T-Hub's network of service providers offers cost efficiency, technical assistance, specialized knowledge, and policy guidance to startups. It has partnered with over 80 angel investors and venture capitalists, enabling startups to secure nearly \$2 billion in funding. In 2022, T-Hub was named India's Best Incubator by the Department for Promotion of Industry and Internal Trade and Best Technology Business Incubator by the Department of Science & Technology.

T-Hub neighbor T-Works a state-of-the-art makers lab government initiative in Telangana, offers prototyping services in various fields such as metalworking, woodworking, ceramics, 3D printing, laser cutting, and electronics testing. The facility plans to expand capabilities to multilayer PCB fabrication, plastics and composites, high-speed CNC machining, and digital cutting technologies. T-Works has launched the Solution Seekers platform, which manages queries from makers, innovators, startups, and businesses. The Rural Innovators Development Programme, collaborations and partnerships platform, and solutions seekers platform support grassroots innovators and artists. T-Works has also launched India's first private rocket, Vikram S, and developed a hybrid VTOL UAV for the Medicine from the Sky initiative in Telangana. They also designed surgical guides for COVID-19 patients and introduced a Cinepreneur program for media and entertainment sector professionals.

T-Hub, a global startup innovation hub, is dedicated to fostering an open innovation model by involving startups, corporate entities, research institutions, and government organizations to tackle industry and societal challenges. It has collaborated with various sectors, including aviation, automotive, banking, financial services, insurance, consumer goods, healthcare, and manufacturing, to address various issues through corporate partnerships. T Hub also co-creates innovation programs with educational institutions and industry bodies to conduct research and development in various areas. The hub aims to create a world-class ecosystem and contribute to India's mission of becoming a global innovation leader. It aims to transform challenges into opportunities, ideas into innovations, and dreams into realities, building the future one breakthrough at a time.

## **IX. Conclusion**

Telangana, India's youngest state, contributes over \$140 billion to the GDP and fosters an innovation-driven economy by nurturing innovators, researchers, startups, and entrepreneurs. Programs like TSIC, TASK, WE-Hub, T Spark, and YFSI support student entrepreneurs and collaboration among government, industry, and academia. T-Hub, India's largest innovation ecosystem, was established in 2015 in Hyderabad. It houses around 1,000 startups and serves as a microcosm of the innovation ecosystem, involving startups, corporates, investors, academia, and national and international ecosystem enablers. T-Hub's innovation strategy is guided by the 6Ms (money, methodology, market access, mentoring, motivation, and manpower) and the 2Ps (partnership and policy advisors). It operates accelerator programs for government entities and has partnered with global ecosystem enablers and governments. Over the past nine years, T-Hub has helped over 2,000 entrepreneurs and nearly 600 corporations transform ideas into tangible outcomes.

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