



**GOVERNMENT OF TAMIL NADU**

# TAMIL NADU R&D POLICY 2022







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**Industries, Investment Promotion and Commerce Department  
Government of Tamil Nadu**



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# 1. Preamble

## 1.1. Introduction

Research & Development (R&D) enables innovation in developing new knowledge, techniques, and technologies that increase productivity and consequently spur long-run economic growth globally. Tamil Nadu is among the top three states in India in R&D, and has evolved into a human capital hub that services not only the nation but also the world. This can be attributed to its targeted human capital policy that encompasses progressive schemes for education, health, social welfare, and dedicated industrial policies to boost manufacturing.

The tremendous growth in Engineering Research and Development (ER&D) over the last decade has led to innovation across sectors and industries. World leaders in the manufacturing and services sectors are investing heavily in R&D to achieve competitiveness and production efficiency in the international market. Innovation and digital disruption in advanced manufacturing have further altered the global supply chains and facilitated improved interface with the end-users. Among various segments of engineering R&D, the automotive segment and designing accounted for the largest market share in 2019 in the global market.

In the global race for innovation, Tamil Nadu has proved to be a leading destination for R&D and innovation. Globally technology exports are dominated by pharmaceutical products, high-performance computers, aerospace, scientific instruments, and electric machinery. Innovation in sectors like FinTech, clean energy systems, biotechnology, precision medicine, genomics, electric vehicles and components, smart grids, and semiconductors, has resulted in higher R&D in advanced technologies. Areas like analytics, artificial intelligence, and machine learning contribute to greater efficiencies. Therefore, the State has a huge opportunity to foster innovation and increase productivity in the above mentioned areas given its strength in segments such as automobiles, heavy machinery, and electronics led by its highly-skilled workforce.

The frontiers of R&D are far-reaching and ever-expanding, which provides an opportunity for Tamil Nadu to attract R&D investments in the State.



## 1.2. Advantage Tamil Nadu

Tamil Nadu is one of the most advanced and admired economies in India. It offers a host of advantages in terms of human capital, knowledge and research infrastructure, diversified economy, and favourable investment climate. These are enlisted below:

- It is a knowledge capital with 59 universities, 2639 colleges, 860 standalone institutes, 200 central and state research institutes, 2 central universities, and 7 institutes of national importance.
- It is among the top three states in the national innovation index where it ranks third in knowledge output, second in knowledge diffusion, and first in human capital.
- Accounting for a 9% share, it has the second highest State R&D expenditure in the country.
- It has 9 lakh students graduating from various levels such as PhD, M Phil, Post-Graduate, Graduate, and Diploma. In the India Innovation Report 2020, it is ranked number one in Human Capital with 100% score in enrolment in engineering and technology.
- It is one of the few states to have more female researchers than male researchers (PhD, M.Phil., and Post-graduates).
- With the aim of serving the community, the State has proactive innovation focussed governmental institutions such as Tamil Nadu Scientific Research Organization (TNSRO), Tamil Nadu State Council for Science and Technology, and Tamil Nadu Startup and Innovation Mission (TANSIM).
- It is home to various research parks, innovation hubs and Centres of Excellences (CoEs), and 80+ Fortune 500 companies.
- Chennai has the lowest real estate costs compared to other cities such as Bengaluru, Delhi-NCR, Pune, and Hyderabad.
- Tamil Nadu is amongst the top 10 in case of availability of employable talent, employability, preferred state to work, and where maximum hiring occurs.
- It is one of Asia's most preferred investor destinations anchoring 9% of Foreign Direct Investment in India since 2000 and has tremendous investment potential.
- It is the first state to publish an Artificial Intelligence Policy and a Blockchain Policy.
- Has extensive network of testing and certification labs to support quality exports; 734 NABL accredited labs in Tamil Nadu (3rd highest nationally).
- Provides strong institutional support to non-industrial and interdisciplinary research in areas related to Agriculture, Health and Medical Science, Infrastructure, and Social Sciences.



# Box 1: Research and Innovation

## Identification of Input and Output

Research and development (R&D) comprises creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge. While one invests resources in R&D to create knowledge, innovation creates an economic value out of this knowledge. Even though the amount of R&D spending by the State and businesses are the most important factor in the innovation ecosystem, not every R&D outcome can be termed as innovation. Traditionally, the impact of R&D spending on innovation has been assumed to be linear. But chain-linked model (Kline Model) suggests that the process of innovation involves various stages, starting from the market signalling the utility of the product, reverse engineering, designing, production, and finally marketing. The entire process comprises feedback loops from the market and within the organization, creating opportunities for research resulting in process and product innovation at every stage. Hence, the Policy recognizes innovation of both products and processes as expected outcomes of the Policy.

It is important for the State to monitor both inputs and proxies for innovation. While the existing literature proposes measures such as patents, publications, technology transfers, and spin-offs as proxies of innovation, measures such as R&D contract volume, R&D budget, and the number of researchers and scientists are considered inputs.

## Factors - Inputs

Innovation is explained by the technological capability of a society. Technological capability is further a function of various inputs such as the access to international technology transfer, institutional endowment (Education, Culture and Governance), R&D investment by the government and businesses, learning by internalization, and examining current market trends, and customer preferences.

## Output

There are multiple ways of measuring the output depending on the ownership, funding source, and agenda. For instance, an R&D project focused on process improvement might not generate a patent but may publish its results in a journal citing increased productivity and efficiency. Government of Tamil Nadu will track publications, patents, industrial designs by origin, trademark applications, number of citations, and ICT exports, as a measure of innovation.

Tamil Nadu offers a unique platform to research what's so far un-researched; develop what has not yet been developed; and make marketable what has not yet been sold.



Naushad Forbes (2022)



## 1.3. Industry 4.0 and Evolution of GCCs

It is widely accepted that we are in the age of Industry 4.0. However, in order to fully appreciate the context and extent of the new-age cyber-physical systems, it is important to understand the journey, interlinkages with globalisation, and the way forward.

The First Industrial Revolution began in the 18th century through the use of steam power and mechanisation of production. The Second Industrial Revolution began in the 19th century through the discovery of electricity and assembly line production moving into mass production that was significantly faster and at a lower cost. The Third Industrial Revolution was a 20th century phenomenon that began in the 1970s through partial automation using computers and got accelerated during the 1990s with widespread adoption of information and communication technology. The world has presently shifted gears into the Fourth Industrial Revolution, which is characterised by the application of information and communication technologies to industry and is also known as "Industry 4.0". This builds on production systems that already have computers by adding it on to a network to communicate with other facilities, leading to "cyber-physical production systems" and "smart factories", where production systems, components, and people communicate via a network and production can become autonomous. Industry 4.0 is driven by an amalgamation of emerging technologies like enhanced computational power, Internet of Things (IoT), business analytics, augmented reality, artificial intelligence, elemental design, simulation, advanced robotics, additive manufacturing, and sensor based technologies.

The globalisation journey can be understood through the paradigm of unbundling<sup>1</sup>. For centuries, much before the invention of steam engine, trade was a way to realise profits when relative prices differed across countries. Thus, globalisation was first created by goods crossing borders. This was the first unbundling – the geographic separation of production and consumption. From the 1990s, with the advent of information and communication technology, globalisation was furthered by knowledge crossing borders, which meant manufacturing could also cross borders to capitalise on the wage difference. This was the second unbundling – the geographic separation of stages of production. This was disruptive for the world as it forged global supply chains for manufacturing. However, offshoring of services also emerged as a lucrative opportunity as technology reduced the barriers to wage arbitrage in the services sector. This is the third unbundling – the geographic separation of labour and labour services. Concepts such as Future of Work and Smart Factory which were highlighted during the pandemic can be explained as the acceleration of the third unbundling.

In 1990s, Tamil Nadu saw a simultaneous trend of growth of mass production assembly lines (Third Industrial Revolution) through global value chains for goods (second bundling) and the growth of offshoring in services (second unbundling). The journey of offshoring in services (presently GCCs) began with the multi-national companies (MNCs) setting up captives that operated as resource centres. This reduced the cost of ownership of certain business functions and/or provided resources that helped the parent MNC scale its operations. Between 2000 and 2010, the role of services offshoring evolved to Business Process Outsourcing/ Knowledge Process Outsourcing (BPO/KPO), which functioned as quality centres to prove quality of modular products and services through process standardization and optimization. From 2010 onwards, the role expanded to a Shared Services Centre (SSC) or Global Business Centre (GBS) or Centre of Excellence that functioned as a delivery centre, where a parent MNC leveraged the captive to manage an end-to-end delivery of global products through improved coordination with the parents and other centres. It provided increased breadth and depth and coverage of services. This role further evolved to the present mandate of a Global Capability Centre (GCC) where the focus is on innovation for the parent MNC's business, conceptualization, design, and delivery of new products stemming from a global skills' hub for the enterprise and transitioning from a traditional cost centre to a centre with the potential of generating

revenue impact. While traditional functions of GCCs will continue to provide efficiencies, GCCs will be more of “Digital Transformation Centres” and “Innovation Centres” for global businesses. However, these are further expected to evolve into Global Intelligence Centres (GIC) which will serve as a market expansion centre for local market expansion and management of strategic local partnerships with integrated governance management of capability centre ecosystems.

In this context, GCCs are not new to Tamil Nadu and have been present in the State for nearly three decades in its earlier avatars. The growth and evolution of GCCs is important in the current context of R&D as Engineering R&D has a 55% market share in GCCs in India. India’s Engineering R&D GCC talent pool grew at over 11% CAGR during FY 2015-21 on the back of digital transformation. The focus has shifted to product innovation, engineering design, and R&D. Banking, financial services and insurance (BFSI) and Professional Services firms have started expanding their scope to cover research, underwriting, and consulting. Some global MNCs that now have large GCCs in India are Apple, Microsoft, Google, Nissan, Ford, Qualcomm, Cisco, Wells Fargo, Bank of America, Barclays, Standard Chartered, and KPMG. Tamil Nadu has around 150 GCCs with different industrial domains such as Ford, Caterpillar, Daimler, Renault Nissan, World Bank, Shell, PayPal, Verizon, AstraZeneca, Walmart, Bosch, Philips, Citi, Mr. Cooper (formerly known as Nation Star Mortgage). In Tamil Nadu, a manufacturing hub, the R&D ecosystem is driven by the industry. Many of the GCCs located in Tamil Nadu also have a manufacturing presence in the State. Hence, R&D Centres and GCCs are highly interlinked in Tamil Nadu.

In the post-COVID world, the boundaries between manufacturing and services are getting blurred further, and business models are getting transformed to take advantage of the digital age. As R&D Centres focusing on Industry 4.0 meet GCCs in the third unbundling of globalisation, with the capability of delivering high technology at cost effective wages (as compared to the parent MNC headquarters), the prospects of high-value jobs for Tamil Nadu are manifold. While the nature of R&D firms in manufacturing and GCCs are sometimes different, the objectives and policy levers to promote R&D and innovation are aligned. In that context, R&D firms and GCCs are two facets of industrial revolution and globalisation with a shared origin. Cognizant of the differences and similarities between them, Tamil Nadu, through this Policy, would focus on harnessing the potential of successfully creating a footprint of R&D firms and GCCs in the State.

## 1.4. Value Proposition

Global spending on R&D in 2018 was US\$ 2.233 trillion. While India’s share in Global R&D is only at US\$ 58 million (PPP US dollars), the nation’s gross expenditure in R&D has trebled between 2008 and 2018. With the evolution of scientific R&D policies at national and state level, India’s per capita R&D spend has increased by 62% from 2007-08 to 2017-18 and India ranks 3rd in terms of number of PhDs awarded in Science and Engineering, behind the US and China. The global engineering R&D services outsourcing market is largely explained by the automotive industry with a market share of 21% (as of 2019), mainly comprising the designing segment. Other key segments in global engineering R&D are telecommunication, aerospace, consumer electronics, pharmaceutical, construction, semiconductor, and computing systems. India’s engineering R&D market is expected to grow at a compounded annual growth rate (CAGR) of 12-13% to touch USD 63 billion by 2025. Tamil Nadu houses 9.5% of total R&D institutions in the country, with a slightly larger share of private sector R&D institutes, estimated at 11.5%. It is estimated that the State has around 150 Global Capability Centres, with largest contribution from cities such as Chennai and Coimbatore.

The main value proposition of GCCs for Tamil Nadu is employment creation of high value jobs. GCCs were estimated to employ more than 1.3 million people as of FY 2020 in India. GCCs sector can potentially scale up to \$60-85 billion in the next five-six years, according to a NASSCOM-Deloitte





report. The number of employees in GCCs has grown by 75% (from 7,50,000), whereas overall revenues have expanded by 11% CAGR from \$19.4 billion in 2014-15. About 20% of the growth in centres come from new organizations.

Given that more than half the GCCs are engineering R&D firms, and Tamil Nadu is an established industrial hub, the State shall focus on R&D firms and GCCs to achieve higher value creation in output and employment.

## 1.5. Need for the Policy

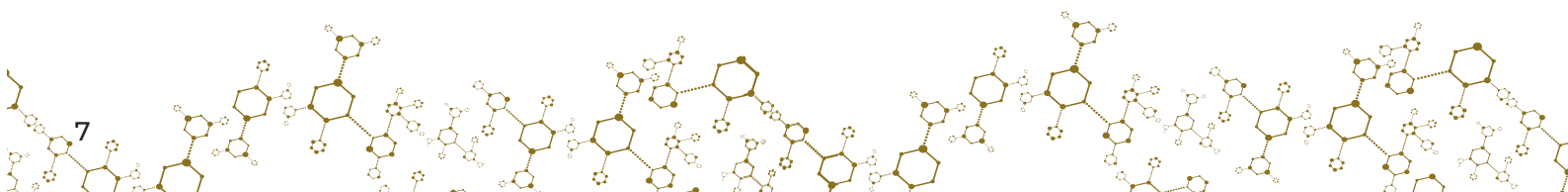
Long-run per capita economic growth is driven by productivity growth, which in turn is driven by investments in education and research, and competition in product markets. The State recognizes the complexities in the innovation process and increasing competition; this furthers the need for a separate R&D policy. The following factors reflect the aspirations of the State for encouraging R&D:

- To move up the value chain in manufacturing and capitalise the economic opportunities created by the evolution of manufacturing and value-added services by encouraging product development in R&D centres & GCCs
- To increase supply of scientists and researchers, and catalyse creation of high-value jobs and its retention in the State
- To create a conducive ecosystem for R&D that is competitive nationally and globally
- To encourage R&D and innovation in the private sector for socio-economic development
- To address information asymmetry, accelerate intellectual property generation and improve probability of commercialisation
- To monitor the R&D performance and outcomes in the State

## 1.6. Scope of the Policy

Science is built on exploration that converts information into knowledge. Engineering drives invention by converting knowledge into utility. Design is critical for communication and converts this utility into cultural behaviour and social context. Art derives from expression that takes this cultural behaviour and questions the perception of the world. All these disciplines are interconnected, and the output of one can feed as an input to another. There is a flow of creativity across all disciplines that enables innovation. A comprehensive and interdisciplinary approach is required to encourage R&D in the State. This requires a shift from compartmentalised paradigm (where primary, secondary, and tertiary sectors are viewed as different sectors of the economy), to a cohesive view of the economy driven by integrated manufacturing and services as the lines between these traditional paradigms become blurred. Hence, the scope of this Policy shall include firms that are engaged in R&D centres in core manufacturing as well as Global Capability Centres.

Further, this Policy shall encourage R&D with a commercial potential - the process also known as 'valorisation of research'. The State shall encourage valorisation of all aspects of research - basic, applied or experimental, through which research is made more accessible and usable by society at large. In the Tamil Nadu Industrial Policy 2021, the State had recognised Focus and Sunrise sectors as the engines of future growth. This Policy adopts a challenge-driven approach to identify R&D that serves societal challenges and caters to developmental opportunities. The scope of this Policy shall be limited to R&D projects undertaken by private companies and research institutes independently, or in partnership with private companies that are in Focus and Sunrise Sectors, and are aligned to the Grand Challenges.



# Grand Challenges

The State is keen on promoting R&D in projects that have a direct social impact. The following Grand Challenges are aligned with the vision and priorities of the State:

- 1) Clean Energy
- 2) Sustainable and Advanced Manufacturing
- 3) Health, Well-being, and Life Sciences
- 4) Future of Mobility
- 5) Digital and Data Economy

## Focus and Sunrise Sectors

Sunrise sectors have a high potential for growth, diversification and investment, and often are R&D intensive. This Policy shall also focus on Focus Sectors such as Financial Services, Hardware and Software Products.

The terms and definitions in the existing implementation guidelines of Tamil Nadu Industrial Policy 2021/ Tamil Nadu MSME Policy 2021 shall apply to this policy, wherever applicable.

## 1.7. Policy Term

The Tamil Nadu R&D Policy shall come into effect from the date of issue of Government Order and will be valid for a period of ten years or until a new policy is announced, whichever is earlier.



# 2. Objectives

## 2.1. Vision

Transform Tamil Nadu into a knowledge-based economy by 2030, driving manufacturing and service excellence.

## 2.2. Mission

- Increase the inputs to R&D, including the number of researchers and scientists
- Increase the outputs for innovation, such as patents and publications.
- Develop a synergetic innovation ecosystem of research parks, research centres, centres of excellence, and innovation hubs.
- Promote R&D in private sector by targeting new indigenous R&D performing firms in both manufacturing and service sectors such as GCCs, stimulating greater R&D investment in R&D performing firms, encouraging firms that do not yet perform R&D, and supporting public-private collaboration in R&D centres and GCCs.

## 2.3. Goals

To double the R&D expenditure in the State from the Government, Higher Education, & Private Sector by 2030.

## 2.4. Programmatic Approach & Policy Mix

The State shall adopt a programme-based approach by designing and implementing, or supporting strategic projects or program aimed at achieving a large-scale impact on society. Such an approach provides flexibility to various departments of the Government with respect to the choice of measures to be adopted in order to achieve the objectives.

Further, R&D can be encouraged only through a cohesive policy framework. The existing State policies such as the Industrial Policy, Information Communication Technology Policy, Data Centre Policy, FinTech Policy, Electronic Hardware Policy, MSME Policy, Start-up & Innovation Policy, Artificial Intelligence Policy, Blockchain Policy, Cybersecurity Policy, and Electric Vehicle Policy recognize the importance of R&D in various sectors of the economy and endeavour to support businesses in investing in R&D through fiscal support and facilitation. The Tamil Nadu R&D Policy adds to this policy mix of industrial and technology policies that collectively aim to foster R&D and innovation using both, sectoral and broad-based policy levers.

The growing policy mix will focus not only on core manufacturing R&D, but also services, and related product development, and process efficiencies in the State, with the aim of moving to a higher part of the IT/ITeS value chain, and ensuring that other industries make a smooth transition to digitization.

Specifically, in this Policy, the broad-based policy levers are- fostering linkages between industry, academia and the Government, incentives for the private sector, human capital interventions, support for start-ups and MSMEs, and funding. With this Policy, the State has adopted an agile, programme-based, and a challenge-driven approach to creating an innovation policy mix.



# 3. Fostering Linkages

A successful innovation ecosystem is an outcome of strong linkages among academia, industry, and government. To further strengthen these linkages, the Government of Tamil Nadu shall undertake concerted efforts through the creation of knowledge infrastructure, developing platforms for collaboration on Industries 4.0, preparing a future-ready workforce, establishing centres of excellence, facilitating international collaboration, and organising promotional events to recognise and encourage R&D.

## 3.1. Knowledge Infrastructure

### a) Innovation Clusters

Tamil Nadu has an excellent innovation ecosystem in academic institutions, national, and state research laboratories. In order to enhance the synergy and collaboration between these and external stakeholders like relevant government departments, industry partners, start-ups, MSMEs, philanthropic foundations, think-tanks and non-profit or non-governmental organisations, the State shall develop Innovation Clusters across the State, anchored by an academic or research institute. The cluster will create a shared ecosystem by developing high-end labs with shared access, enabling mobility of research within and across clusters, and cultivating a talent pool for high quality jobs. Aligned with Tamil Nadu’s mission of harnessing the State’s skilled human resources for economic development and enabling balanced regional development, these Innovation Clusters will partner with incubators and stakeholders in the





region to become a decentralised knowledge hub for solving challenges that have a high local impact. As the clusters scale and develop recognition for international collaboration, this cluster-based development of innovation has the potential to unlock competitiveness for the State globally.

## **b) Hi-Tech Corridor**

Tamil Nadu has adopted a corridor and node-based development model for investment growth that is built on infrastructure development. The State is already developing industrial corridors such as Chennai-Bengaluru Industrial Corridor, Chennai-Kanyakumari Industrial Corridor, the Kochi-Coimbatore-Bengaluru and the Defence Industrial Corridor, that enables spending on infrastructure allocated to certain nodes or regions. A dedicated Hi-Tech Corridor shall be dovetailed in the industrial corridors with the Innovation Clusters as nodes. This will enhance the coordination among various nodes comprising industries, universities, and research institutes engaged in manufacturing and R&D. These shall connect existing and upcoming nodes of innovation clusters catering to sunrise sectors such as Chennai, Sriperumbudur, Hosur and Coimbatore.

## **c) Knowledge City**

As a pioneering initiative aligned with the State's mission of creating a future-ready workforce for high-value jobs, the Government of Tamil Nadu will establish a Knowledge City through international collaboration. The City will bring together high-calibre universities and educational institutes of national and international prominence. Striving to create an ecosystem of excellence in learning and human resource management, the City will also have skills training centres and attract R&D centres in ICT and manufacturing. The students will graduate with internationally recognised degrees, certifications and diplomas, strengthening Tamil Nadu's position as a provider of high-quality human capital for the nation and the world.

## **d) Research Parks**

One of the most successful models of an innovation hub, the IIT-M Research Park was first implemented in Tamil Nadu. Research Parks serve as a key enabler of innovation and accelerator of human capital formation in a knowledge economy. The Government of Tamil shall replicate and scale this model across the State. The State will identify suitable land parcels for the development of Research Parks. Further, universities in the State will be encouraged to set up research parks on their campuses in collaboration with public sector entities like TIDCO, SIPCOT and TANSIDCO. Additionally, TIDCO and SIPCOT shall undertake studies with the third parties to understand and examine the industry-specific infrastructural and facility requirements in a research park to ensure that the industry-specific differences are accounted for while planning and allocating resources for the research parks.

## 3.2. Industry 4.0 Platform

The State shall create a dedicated platform catering to opportunities and information on Industries 4.0. This platform shall act as a rich and up-to-date knowledge repository of contextual and useful information that can help all stakeholders. The digital platform shall provide information to industries related to accredited service providers/skilled personnel, case studies and toolkits on Industries 4.0, CoE, academicians, start-ups, and independent researchers - their areas of specialization, recent patents and publications. This platform will help GCCs and R&D companies find high-tech solutions from researchers and scientists for their industrial problems. The platform will be further used by the industry and industry associations for posting their call for proposals. Academia can benefit from this platform by showcasing or participating in projects and connect with industries on placement and internship opportunities. Accredited service providers will be able to showcase their service offerings on Industries 4.0 to all stakeholders.

## 3.3. Work Labs

The State has established Work Labs as a special cell under Guidance to enable the synergy between industries and academia, in order to equip graduates with the required skills for innovation and industrial readiness in sunrise sectors. The requirement from industries is identified and mapped to the existing curriculum offered by the institutes and universities within the State with recommendations on curriculum or course revision or internship programs. Work Labs also act as a bridge between the academia and industry to facilitate internships, industrial training for professors, academic trainings to industrial workforce, and coordinate lifelong learning programmes in Private Sector R&D companies. Work Labs shall work with the Tamil Nadu State Council for Science and Technology (TNSCST) to offer short term diploma/online courses on research methodology, data analytics and science, scientific writing and publishing, effective collaboration in research, and grant writing.

## 3.4. Centres of Excellence

CoEs are state of the art facilities created to develop emerging technologies to support industries in the niche and sunrise sectors. With the active growth of the smart manufacturing in Tamil Nadu, infusion of new technology platforms in the form of CoE are considered essential to enable capability building and accelerates growth and transformation of the manufacturing and ICT companies to newer boundaries in the State. The Centres disseminate specialized knowledge and enhance competency through highly skilled individuals and experts. The objective of CoEs is to enhance capabilities and productivities of existing industries and MSMEs, and promote innovation in the identified sectors. The State shall continue its efforts to support the three kinds of established models of Centres of Excellence:

### **a) Centres within an Educational Institute**

There are over 15 centrally and state recognized COEs operating within the educational institutes in Tamil Nadu. The State shall encourage grant-based development of university affiliated CoEs under the Research and Technology Fund.

## **b) Stand-alone COE**

A scheme called “Promotion of Centres of Excellence for Emerging Technologies in Manufacturing” has been formulated by TIDCO. With an emphasis on encouraging R&D, the Government shall establish Centres of Excellence through public private partnerships in key manufacturing areas aligned with the Grand Challenges. The CoEs operating will be provided with infrastructural support for designing, product development, prototyping, manufacturing, skill development, and R&D activities to help industries adopt future technologies.

## **c) Networks of Excellence**

TNeGA has established the Centre of Excellence in Emerging Technologies (CEET), with the vision to bridge the knowledge gap between the development and application of emerging technologies in Government Departments. CEET is envisaged to act as a catalyst for the diffusion of innovation into the targeted departments.

## **3.5. National and International R&D Collaboration**

For the free flow of knowledge, the linkages among the stakeholders should not just be confined to local geographical, and political boundaries. International collaboration between international universities, State institutes and R&D companies is a critical component of knowledge infrastructure. There are various national and international consortiums and networks that promote the progress of science such as the National Science Foundation and CMS. The Government shall facilitate collaboration between State universities and colleges with these research consortiums to help the State researchers get international exposure and leverage bilateral research cooperation between India and focus countries. Further, the State shall encourage industry and academia to leverage the unutilized funds allocated to R&D at a central level (DBT/DST/DSIR) through knowledge dissemination.

## **3.6. Conclaves**

The State shall organise regular outreach events to invite new and existing R&D and GCCs to showcase the best practices and recognition in the State’s flagship events with a focus on Tier 2 /3 cities.



# 4. Incentives

One of the key policy objectives is to boost private R&D expenditure. Private businesses engage in R&D activities mainly to increase the competitiveness of their products and services and hence innovation is intrinsic to their growth. Private sector participation in R&D is vital to create an impetus for innovation-led growth for the State. R&D has attributes of a public good that is indivisible (non-rival in use) and has a cost for exclusion. The markets, therefore, have a tendency of undervaluing R&D. This calls for support from the Government to eliminate the market failure. The Government of Tamil Nadu recognizes the private sector as the engine of growth of R&D in the State and hence shall support the business initiatives related to establishment and expansion of R&D Centres and GCCs through various targeted incentives.

The approach to incentives is designed on three aspects. Firstly, as a first of its kind initiative by Tamil Nadu for incentivising the services sector, the State shall incentivise GCCs at a par with engineering R&D centres. This is because R&D intensive processes and product development is undertaken in both. Secondly, the State shall provide targeted incentives over and above the Industrial Policy to cater to the unique requirements and nature of R&D. Thirdly, given that identification of an R&D firm is difficult, suitable relaxations/ modifications have been provided on eligibility.

## 4.1. Eligibility

R&D firms (standalone and in-house) and GCCs meeting the eligibility criteria listed herein shall be eligible for incentives outlined in this section, subject to the following conditions:

- Must have a Minimum Investment of Rs. 50 cr. in Eligible Fixed Assets within a Standard Investment Period of 4 years and creation of Employment for 50 persons
- Clearly demarcated facilities in or outside the Projects
- Must be engaged in product R&D in Tamil Nadu

### a) Eligibility Criteria for R&D Centres

- i) In house R&D units should be engaged in manufacture or production or in rendering technical services. Companies engaged in contract research and stand-alone R&D units shall also be considered.
- ii) R&D firms are expected to be engaged in innovative research & development activities related to the line of business of the firm, such as the development of new technologies, design & engineering, product development, development of new methods of analysis & testing, and research for increased efficiency in the use of resources.
- iii) At the time of application, the R&D unit(s) should be functional or should have well defined, time-bound R&D programmes leading to the development of innovative products and/or technology(ies).
- iv) Firms engaged solely in market research, work & methods study, operations & management research, testing & analysis of routine nature for operation, process control, quality control and maintenance of day-to-day production, and maintenance of plant shall not be considered as R&D firms.

### b) Eligibility Criteria for GCCs

- i) The GCC is in the most recent Forbes Global 2000 list or Fortune 1000 list.
- ii) The GCC is a greenfield or existing GCC is expanding their operations in Tamil Nadu after the date of issue of the Government Order and prior to 31.12.2027.
- iii) The GCC (new or existing) will create a minimum 500 jobs within the Standard Investment Period of 4 years.

Given that the distinction between R&D firms and manufacturing units and ICT service providers can sometimes be fuzzy, the firms that do not strictly meet the criteria, can also submit a proposal to the sanctioning authorities for consideration. The additional eligibility criteria are mentioned in Annexure 1

## 4.2. Special Package of Incentives for R&D Centres and GCCs

Projects with investments made from April 1, 2022, will be considered eligible for availing incentives. The Special Package of Incentives for R&D Centres and GCCs will include the following incentives applicable to R&D Projects as per TNIP 2021 specified in Para 4.2.1 to Para 4.2.6 below, with suitable relaxations/provisions/enhancements and additional incentives as specified in Para 4.2.7 to Para 4.2.10.

### Special Incentives Applicable based on TNIP 2021

#### 4.2.1. Land Cost Incentive for Standalone R&D Projects

R&D projects shall be given an incentive of 50% of the cost of purchase or lease of land for up to 20 acre, subject to a ceiling of Rs. 50 lakh/acre. This shall be provided as a reimbursement upon commencement of the R&D Centre. R&D projects shall also be given priority in land allotment in SIPCOT Industrial Parks.

#### 4.2.2. R&D Training Incentive

R&D Training Incentive of Rs. 10,000 per person per month can be availed for 12 months for the residents of Tamil Nadu. This incentive is intended for employees engaged in core R&D who have an undergraduate degree in technology/sciences and a work experience of 7 years, or a post-graduate degree in technology/sciences and a work experience of 5 years, or a doctorate in sciences/technology. It excludes employees in administration or in support services deployed in R&D projects. Projects availing the R&D Training Incentive shall not be eligible for Training Subsidy under the Structured Package.

#### 4.2.3. Enhanced Quality Certification Incentive

Projects obtaining certifications like ISO, ISI, BIS, FPO, BEE, AGMARK, and ECOMARK or any other national or international certification shall be given a subsidy of 50% of the total cost incurred for obtaining the certification, as certified by the Chartered Accountant, limited to Rs. 1 cr. for the period of investment.

#### 4.2.4. Enhanced Intellectual Property Incentive

The Government will reimburse 50% of the expenditure incurred by the Project subject to a maximum of Rs. 1 cr. for the period of investment for in-house R&D for a patent, copyright, trademarks, and Geographical Indicators registration and up to Rs 5 cr. for standalone R&D assets.



#### 4.2.5. Standard Incentives

The Project shall also be eligible for standard incentives, namely, electricity tax exemption for 5 years, stamp duty exemption, and green industry incentives of up to Rs. 1 cr. (refer to TNIP 2021 Para 13.5). In-house R&D units shall not be eligible for standard incentives if the Industrial Unit has also availed the incentives for the project. Projects availing the Enhanced Quality Certification Incentive/Enhanced IP Incentive shall not be eligible for Quality Certification/IP Incentive under Standard Incentives, respectively.

#### 4.2.6. SGST Refund on Capital Goods

The Project shall also be eligible for SGST refund on capital goods as specified in Para 13.6 of Tamil Nadu Industrial Policy 2021.

### Additional Incentives over and above TNIP 2021

#### 4.2.7. Special Capital Subsidy

The R&D companies and GCCs are known for their highly capital intensive nature of operations. These companies also rely on imports of specialized equipment that are necessary to carry out research and product development activities. To support the competitiveness and quality of research activities projects, a special capital subsidy of 25% on the Eligible Fixed Assets shall be disbursed in equal instalments of over 10 years from the date of purchase of land, machinery and equipment, subject to a ceiling of Rs. 25 crores, whichever is lesser.



As per TNIP 2021, EFA shall include investment in R&D such as land, building, plant, and machinery. To encourage R&D, EFA shall include the following intangible R&D related expenditure, subject to a ceiling of up to 20% of EFA:

- i. Expenditure incurred on new R&D: Test and measuring instruments, prototypes used for testing, purchase of design tools, software cost (directly used for R&D) and license fee, expenditure on technology, IPR, patents, and copyrights for R&D.
- ii. Expenditure related to Transfer of Technology (ToT) Agreements: This shall include the cost of technology and initial technology purchase related to the manufactured goods that are related to manufacturing and R&D in Life Sciences.

All non-creditable taxes and duties would be included in such expenditure.

#### **4.2.8. Innovation Lab Incentive**

Innovation labs allow diverse participants and long term collaborations for the purpose of creating and prototyping radical solutions to predefined systematic challenges. Innovation labs develop tangible solutions and therefore seek to remain active throughout the entire innovation process, going beyond the ideation stage, where possible. To promote these labs that cater to the needs of innovation clusters and act as a catalyst for the research and development, 50% of the EFA created on innovation labs shall be reimbursed, up to Rs. 1 crore. The incentive is available only to innovation labs that are accredited/certified as per NABL, ISO certified or any other national or international standards.

#### **4.2.9. License Cost Incentive**

The cost incurred on proprietary software licenses is one of the major areas of expenditure for R&D firms and GCCs. Considering the nature of technology intensive operations that contribute to high operating costs, 50% of the expenditure incurred on the purchase of a specialized software license within the Standard Investment Period of 4 years subject to a ceiling of Rs. 25 lakhs.

#### **4.2.10. Product Testing & Prototyping Incentive**

Prototyping is a crucial stage before commercialization wherein the product developer can test the design and identify errors if any before the commercialization. To encourage prototyping within the State, R&D firms and GCCs shall be provided with a subsidy of 25% of the EFA on establishing product testing and prototyping facilities, subject to a ceiling of Rs. 1 crore.

### **4.3. Other Relaxations**

In addition to monetary incentives, the Government shall encourage R&D firms and GCCs through proactive labour and FSI relaxations.

#### **4.3.1. Labour Relaxations**

R&D firms shall be provided exemption from Factories Act for demarcated in-house R&D units. GCCs operating in ICT can avail of administrative incentives as offered under ICT Policy 2018 or as updated from time to time. This can be availed for GCC expansion operations also.

#### **4.3.2. FSI Relaxations**

Relaxation of FSI shall be provided as available to ICT firms under the ICT Policy of 2018 or as updated from time to time. This can also be availed for GCC expansion operations.



# 5. Enhancing Human Capital

Investment in education and research drives productivity growth of the State. Universities and educational institutes are the prime contributors in building human capital for R&D. As a consequence, favourable human capital policies can serve as a catalyst for the hi-tech development envisioned. The core idea for enhancing human capital is to have a programme-based approach to building at least 10 high calibre research institutes in the State that are on par with institutes of international prominence. The Higher Education Department shall evolve programs to build research capacities in the State, attract academicians of the Tamil diaspora, and establish Technology Transfer offices. These programs shall be piloted with State-Funded or Private Universities and Colleges in Tamil Nadu that feature in the top 50 NIRF Research rankings.

## 5.1. Research Capacity Building

Universities are the major suppliers of scientists and researchers. The State has a sound base of human capital created by the premier central and state universities, colleges, and polytechnics in Tamil Nadu. In the academic year, 2019-20, despite the pandemic Tamil Nadu had almost 3000 PhD degrees awarded in science and technology. The Government of Tamil Nadu, vide, Higher Education Department, shall undertake concerted efforts to further strengthen the supply of scientists and researchers with a dedicated program for capacity building for research in the State. This shall include, but shall not be limited to the following:

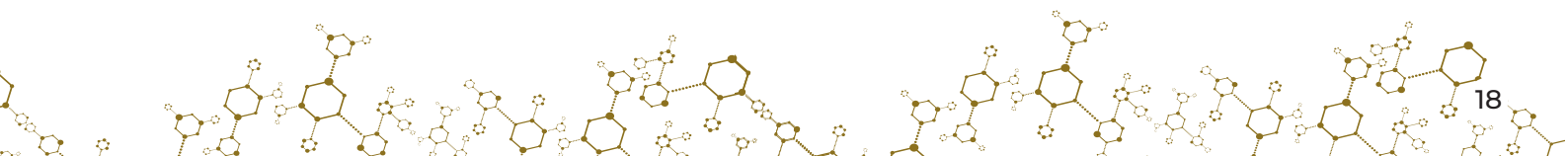
- Provide grants to defray the cost of setting up R&D labs,
- Support on research operating expenditure of PhD students and Professors working on research problems given by the Industry or any area aligned with Grand Challenges that have a commercial application.
- Support publications, conferences, and seminars.
- Increase admission intake for PhD programs in State Universities and Colleges, especially in the disciplines aligned to grand challenges.
- Endeavour to increase PhD stipends of State Universities and colleges /Deemed Universities in the State in phases, at a par with national institutes of importance.
- Create training programs, workshops, and industrial immersion programs for faculty members to understand real-life industrial problems.

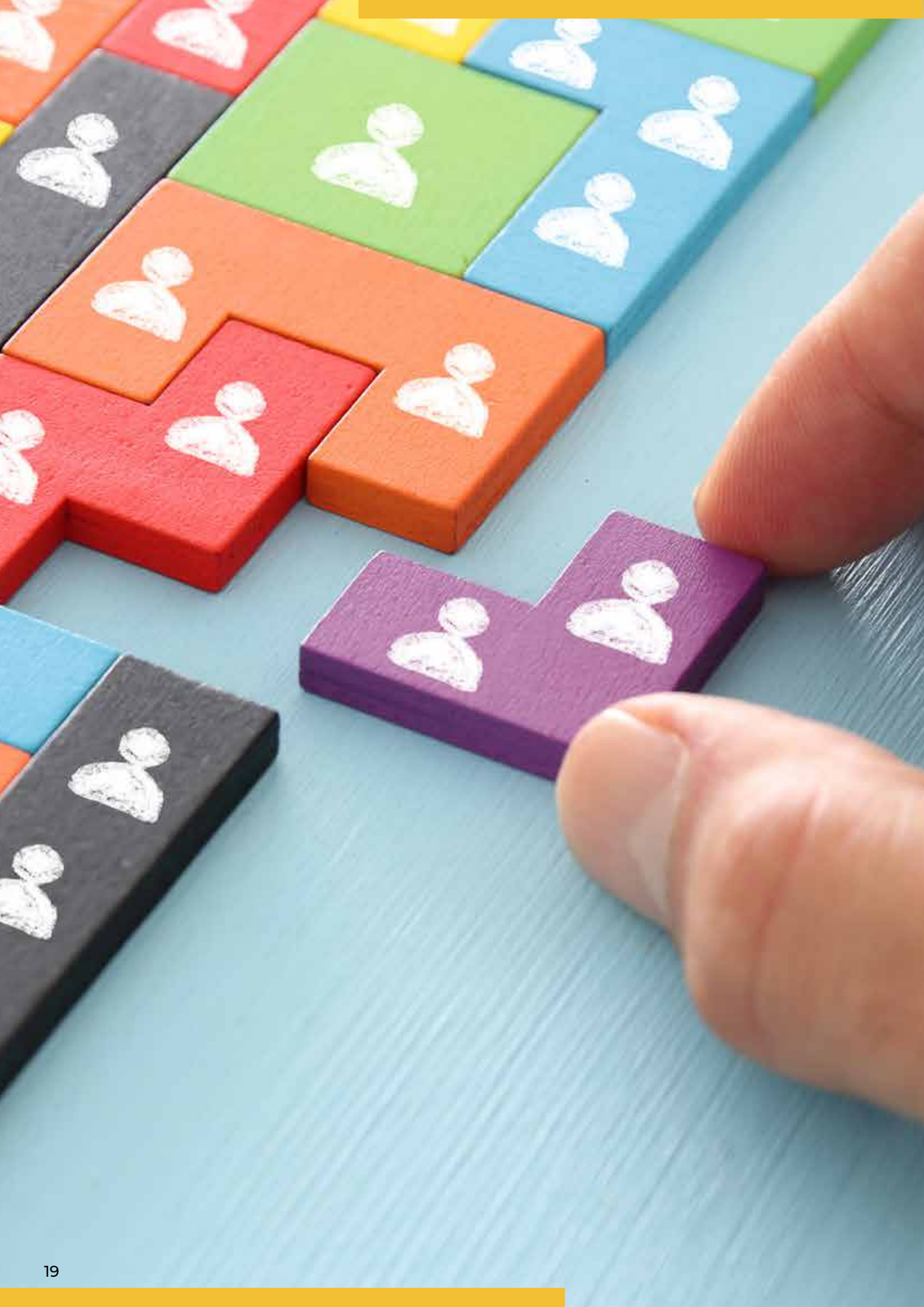
## 5.2. 100 Talent Plan

The Higher Education Department shall evolve a dedicated program to attract scientists and academicians of Tamil origin living abroad. Under the program, scientists or academicians who are affiliated with a renowned international university or a research institute with good quality publications and patents will be invited for short-term appointments in Private and State Universities/Deemed Universities operating within the State, related to Grand Challenges.

## 5.3. Technology Transfer Offices

The State shall support capacity building in technical colleges and universities by establishing a technology transfer office (TTO). These offices will help in translating new and innovative research into commercially viable products or services. These offices shall also serve as the subject matter experts for assisting researchers to establish research relationships with external stakeholders. TTOs shall offer various agreements that are drafted to fit the research needs of the engineering students, scholars, and professors.





## 6. MSMEs and Start-ups

The innovation landscape is not complete without Start-ups and MSMEs. Start-ups incubated in academic institutes and mentored by experts are also popular for providing tech solutions to large industries and governments. Tamil Nadu Start-up and Innovation Mission (TANSIM) has set an ambitious target to establish approximately 10,000 start-ups in Tamil Nadu by 2026. The Government of Tamil Nadu, through its various agencies, shall establish regional start-up hubs, industrial innovation centres, technology hubs and formulate a dedicated research program for the development of MSMEs & Start-ups.

### 6.1. Regional Start-up Hubs

TANSIM shall set up Regional Start-up Hubs in various parts of the State such as Erode, Madurai, and Tirunelveli to enhance the start-up ecosystem across Tamil Nadu. Further, TANSIM shall support state engineering colleges to establish in-house innovation centres in key areas. These incubation centres will offer the required infrastructure, networking facilities, workshops, and legal and marketing assistance for start-ups against monthly fees. Apart from being mentored by faculty members of the premier institutes, these start-ups will receive certification in Human Resource Management, Legal Management, Accounting and Financial Management, Cloud computing, and others from mentoring agencies.

### 6.2. Industrial Innovation Centres

SIPCOT shall establish Industrial Innovation Centres in existing and upcoming industrial estates starting with Coimbatore, Sriperumbudur, and Hosur. These innovation centres aim to support high-tech manufacturing ventures. These centres shall also serve as incubation centres with state of the art machinery to support start-ups through common facilities to boost the existing manufacturing and innovation ecosystem in these locations.

### 6.3. iTNT Hub

The Tamil Nadu Technology Hub (iTNT) shall act as the core connecting the ecosystem of start-ups working in Emerging and DeepTech Areas, with the academic network of more than 570 Engineering Colleges, engaging with researchers and industry partners to pave the way for innovation that will drive the world of tomorrow. Anchored by the Government of Tamil Nadu and supported by the Government of India, iTNT Hub will build India's first DeepTech Innovation Network connected to the world. iTNT has been conceptualised to solve complex challenges in different sectors, such as agriculture, health, or education, using emerging technologies like Artificial Intelligence (AI), data analytics, and blockchain. The hub will function as an accelerator-cum-incubator for start-ups working in the DeepTech sector.

### 6.4. MSME Innovation Research Program

The MSME Department will evolve a competitive and innovative procurement-based program aligned with Grand Challenges that will encourage MSMEs and Start-ups to engage in R&D for the State with the potential for commercialization. This will enable MSMEs to explore their technological potential and commercialize their innovation, while catering to the requirements of the State. This program shall operate in a phased manner starting with establishing the techno-commercial feasibility of the project in response to call for solutions from various governmental departments, followed by prototyping, and finally, commercialisation.

# 7. Funding Avenues

Government funding can encourage firms to collaborate in R&D projects. There is growing evidence that existing partnerships can be intensified, and new ones can be initiated as a result of government funding, and these collaborations continue even beyond the participation or support of the Government. In this context, the Government serves as a catalyst for R&D. There are various sources of funding offered by the Government of Tamil Nadu. Some of the funding avenues relevant to R&D and innovation are listed below.

## 7.1. TANSEED

The Tamil Nadu Start-up Seed Grant Fund (TANSEED) created under the TN Start-up and Innovation Policy 2018 offers grants of Rs 10 Lakh to start-ups. The grant is established in association with Headstart Network Foundation & Villgro Innovations Foundation. TANSEED will support early-stage financing requirements of the Start-ups in the form of grants to fill the gap in fund requirements for research & innovations.

## 7.2. Emerging Sector Seed Fund

Tamil Nadu Emerging Sector Seed Fund (TNESSF) is a Government of Tamil Nadu initiative that has been established with the objective of investing in both start-ups and (non-start-up) undertakings in the sunrise/emerging sectors. The Fund is managed by Tamil Nadu Infrastructure Fund Management Corporation (TNIFMC), and aims to identify and invest in bankable start-ups and emerging sector companies to add alpha to the business in the form of financial and non-financial support. TNESSF has a corpus of Rs. 50 crores for making equity investments in start-ups based in the State and aligns well with the State's objective of fostering innovation in start-ups and sunrise sectors, and with R&D firms looking to raise funds.

## 7.3. Innovation Initiatives

The State Planning Commission, through the Tamil Nadu Innovation Initiatives supports innovation in process, practice, approach, technique, or Information Technology, which is new or novel to public service delivery. Innovative ideas shall be nurtured by special innovation programs (such as Innovation Voucher Program). 25% of the project cost may be provided as a grant to eligible agencies such as State Universities/State agencies. The final quantum of the grant would be decided by the State Planning Commission based on the research proposal and expected research outcome. R&D firms are encouraged to approach eligible agencies for partnership with their proposals.

## 7.4. Research and Technology Fund

A Research & Technology Fund with a corpus of Rs. 100 crore has been proposed in TNIP 2021 to support R&D and Technology adoption in sunrise sectors. This fund shall be operationalized with an addition of Rs. 150 crore to fund R&D activities in the private sector. The fund shall be used to aid Contract/Industry-sponsored research and standalone industrial R&D projects state operating in segments aligned with Grand Challenges.



## 7.5. Extension of Digital Accelerator

The Government of Tamil Nadu has announced a 'Digital Accelerator' scheme under Yaadhum Oorae with American Tamil Entrepreneurs Association (ATEA) to promote start-ups investing from the US in TN from various fields such as IT, Healthcare, Electric Vehicles, emerging areas on IoT, AI, Cloud Computing, and Sustainable Development Goals. It is proposed that a grant of 10% of capital raised may be provided towards operational and capital expenditure, up to Rs. 1 crore per start-up. Similar grants shall be created for start-ups that contribute to innovation, from other countries with Tamil diaspora.

## 7.6. Science & Technology Schemes

The Tamil Nadu State Council for Science and Technology (TNSCST) offers various schemes for final year students and researchers to encourage independent research in Science, Technology, Engineering and Mathematics disciplines. Schemes such as Student Project Scheme, Science and Technology Projects, Young Scientist Fellowship scheme, Tamil Nadu Scientists Award, Innovation, and Product Development provide assistance and scholarship to selected candidates who successfully demonstrate novelty in ideas that have a substantial impact on society. The proposals that are aligned with Grand Challenges and have a potential for commercialization will be further supported with additional financial support.



# 8. Implementation

The Government of Tamil Nadu shall establish a Section 8 Company for the Tamil Nadu R&D Mission (“Cognition”) to achieve global competitiveness in innovation. The R&D Mission will be chaired by the Hon’ble Minister for Industries, Investment Promotion and Commerce and supported by a Leadership Board comprising representatives from the Government, Industry, and Academia. The R&D Mission shall also partner with think tanks & funding agencies for specific initiatives & programmes outlined in this Policy. The R&D Mission shall have three primary mandates, namely, as a facilitator, procurer, and evaluator of R&D in the State.

## 8.1. R&D Facilitator

The R&D Mission shall serve the role of a facilitator in enabling further interactions between academia and industry to develop and build the necessary linkages required. As part of its role as a facilitator, it shall:

- i. Develop and manage the I4.0 Platform which shall provide a common platform for academicians, start-ups, CoEs, and independent researchers.
- ii. Act as a bridge between academia and industry to foster industry academia linkages through programmes such as industrial trainings for professors, academic trainings to industrial workforce, and industrial internships for students.
- iii. Promote intellectual property generation through knowledge dissemination programmes.

## 8.2. R&D Procurement

The R&D Mission shall assist the Government of Tamil Nadu in R&D procurement programmes. As part of this role, it shall:

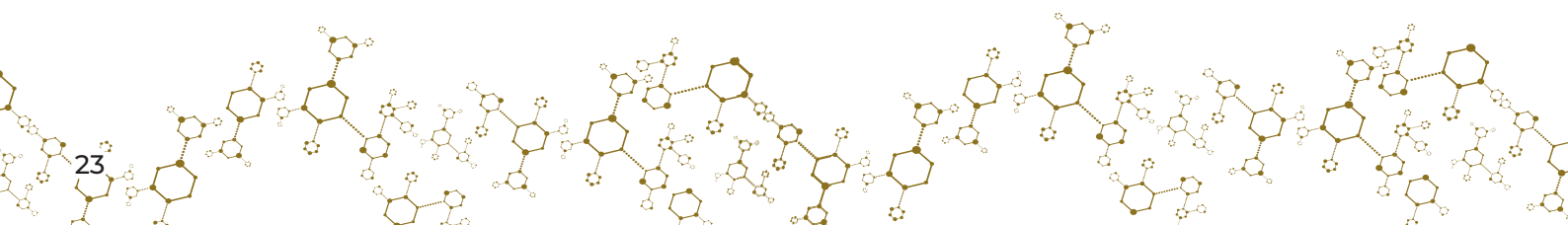
- i. Request for research proposals from various governmental departments and agencies in areas aligned with Grand Challenges.
- ii. Facilitate grants and award programs for research problems taken by an institution/start-up

## 8.3. Monitoring & Impact Evaluation

The R&D Mission shall assist the Government in monitoring & evaluating the impact of R&D projects in the State. As part of this role, it shall create a framework for monitoring, and track the innovation and R&D activities in the State. This shall include R&D spending, the number of innovations, patents filed and received, and publications by Start-ups, MSMEs, private businesses, non-profits and Research Institutes.

## 8.4. Implementing Agency

The R&D Mission shall be the implementing agency for the Policy. To consider and sanction incentives under this policy, the Inter-Departmental Committee constituted for the implementation of the Tamil Nadu Industrial Policy, 2021 shall serve as a recommendatory body to the Cabinet for sanction of incentives. SIPCOT shall be the disbursement agency for all incentives listed in Section 4 of this Policy. Operational guidelines and clarification may be issued from time to time.



# Annexure I

## Additional Eligibility Criteria

- The companies shall submit the latest annual report, a brief write-up on the past achievements in R&D in the country or outside, and ongoing and future R&D projects/programmes of the in-house and stand-alone R&D unit. In addition, the company may enclose copies of bio-data of key R&D personnel/ scientists, major infrastructure available for research, product brochures/literature, certificates of merit or awards etc., which may help the Industries Department appreciate the strengths of the R&D unit.
- A softcopy of the application along with the corporate presentation & a presentation on the R&D of the company should also be submitted.
- The company must spell out a long-term R&D policy.
- R&D activities should be separate from routine activities of the firm, such as production and quality control. The units should have separate & identifiable infrastructure for carrying out R&D work.
- The R&D activities should be clearly demarcated from the manufacturing/quality control activities/IT services.
- The R&D units and GCCs should have well-defined, time-bound R&D programmes. The unit should maintain a proper record of its R&D activities in the form of documentation.
- The units should have qualified staff exclusively engaged in R&D and should be headed by a full-time qualified & experienced R&D person who has direct access to the Chief Executive or to the Board of Directors, depending on the size of the company. The number of R&D manpower should be commensurate with the S&T manpower size of the company.
- The R&D units and GCCs should maintain separate books of accounts for all the R&D expenditures. Expenditure should be booked when incurred and not allocated. The company should reflect the R&D expenditure (both capital & revenue) in the Annual Report and Statement of Accounts of the company in separate schedules. The R&D expenditure incurred should be commensurate with the financial size of the company.



# Notes





# GOVERNMENT OF TAMIL NADU



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