

An Economy driven by Innovation

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**Videsh Vibhag, Bharatiya Janata Party
Research Team**

1. Introduction:

Under the leadership of Prime Minister Shri Narendra Modi India has leaped forward in the **Global Innovation Index** from **76th position in 2014 to 46th in 2021**. The immense faith of the government in innovation and the investment in supporting infrastructure has yielded positive results and more importantly fostered an environment of innovative and critical thinking among the youth & the society at large. It is leading towards the fulfillment of the dream “**Atma Nirbhar Bharat.**”

Sl. No.	Year	Ranking	Score
1	2014	76	33.7
2	2015	81	31.7
3	2016	66	33.6
4	2017	60	35.5
5	2018	57	35.2
6	2019	52	36.6
7	2020	48	36.5
8	2021	46	36.4

Source:- WIPO Report

Prime Minister Shri Narendra Modi had launched one of the government’s flagship programs of ‘**Start-up India**’ initiative, which aimed to promote research parks, technology business incubators, and patent management companies that would promote innovative ideas until they become commercial ventures. These initiatives are based on startup policy and implementation, incubation support, seed funding, angel and venture funding, simplification of regulations, easing public procurement, and outreach. As a result of committed efforts undertaken by the present government Indian R&D ecosystem is the **world’s third largest**, having received a **total funding of US\$ 4 billion**, comprising some **20,000 startups, 280 incubation and business acceleration programmes**, 200 global and domestic venture capital firms supporting home grown startups, and a fast-growing community of **231 angel investors** and **eight angel networks**. Out of 20,000 startups, around **5,000 are tech-led startups**, in which about **15 percent** are involved in AI, blockchain, storage, computing as a service, and robotics. The government has targeted to increase the **number of incubators to 1,000**, for which **US\$ 37 billion is allocated**.

2. Atma Nirbhar Bharat Abhiyaan or Self-reliant India campaign is the vision of New India envisaged by the Hon'ble Prime Minister Shri Narendra Modi on **12 May 2020**, Prime Minister raised a clarion call to the nation giving a kick start to the “**Atma Nirbhar Bharat Abhiyaan**” and announced the Special economic and comprehensive package of **Rs 20 lakh crores** - equivalent to **10% of India’s GDP** – to fight COVID-19 pandemic in India. It is certain that investment in innovation and R&D offers large payoffs in terms of economic growth and competitiveness in global economy.

It can be recalled that the aim is to make the country and its citizens independent and self-reliant in all senses. He further outlined **five pillars** of “**Atma Nirbhar Bharat**” –

- Economy

- Infrastructure
- System
- Vibrant Demography
- Demand.

In furtherance to the above mentioned measures Finance Minister announced Government Reforms and Enablers across 10 Sectors under Atma Nirbhar Bharat Abhiyaan. In addition, the government has taken several bold reforms such as Supply Chain Reforms for Agriculture, Rational Tax Systems, Simple & Clear Laws, Capable Human Resource and Strong Financial System.

Lending under the Atma Nirbhar Bharat:

Priority	Sectors	Implementing Ministry/Department	Approved financial outlay over a five-year period Rs.crore
1	Advance Chemistry Cell (ACC) Battery	NITI Aayog and Department of Heavy Industries	18,100
2	Electronic/Technology Products	Ministry of Electronics and Information Technology	5,000
3	Automobiles & Auto Components	Department of Heavy Industries	57,042
4	Pharmaceuticals drugs	Department of Pharmaceuticals	15,000
5	Telecom & Networking Products	Department of Telecom	12,195
6	Textile Products: MMF segment and technical textiles	Ministry of Textiles	10,683
7	Food Products	Ministry of Food Processing Industries	10,900
8	High Efficiency Solar PV Modules	Ministry of New and Renewable Energy	4,500
9	White Goods (ACs & LED)	Department for Promotion of Industry and Internal Trade	6,238
10	Specialty Steel	Ministry of Steel	6,322
11	Total		1,45,980

Lending under Atma Nirbhar Bharat (earlier phase)

Priority	Sectors	Implementing Ministry/Department	Approved financial outlay over a five-year period Rs.crore
1	Mobile Manufacturing and Specified Electronic Components	MEITY	40,951
2	Critical Key Starting materials/Drug	Department of	6,940

	Intermediaries and Active Pharmaceutical Ingredients	Pharmaceuticals	
3	Manufacturing of Medical Devices	Department of Pharmaceuticals	3,420
4	Total		51,311

2. Global Innovation Index, 2021:

- The Global Innovation Index report 2021 has ranked **India** at **46th**, two places up than last year. The GII statement said that, scientific wings like the Department of Atomic Energy, Department of Science and Technology, Department of Biotechnology, and the Department of Space have played a pivotal role in enriching the national innovation ecosystem.
- It noted, **select middle-income economies are changing the innovation landscape**, starting with China, Turkey, Viet Nam, **India** and the Philippines (TVIP) are now pulling their weight. It further said, the TVIP economies are **systematically catching up**. Beyond China, these four particularly large economies together have the **potential to change the global innovation landscape** for good. The report lauded those developing economies are performing above expectation on innovation relative to their level of economic development.
- It also noted **India**, Kenya, the Republic of Moldova, and Viet Nam hold the record for **over-performing on innovation relative to their level of development** for the **11th year in a row**.
- It also noted, Brazil, China, **India**, the Islamic Republic of Iran, Turkey, and the Russian Federation are all **middle-income economies hosting top S&T clusters**, with **big growth seen in Delhi, Mumbai and Istanbul**.
- It said, India has retained its position as the **most innovative country among Central and South Asian countries**. The consistent improvement in the GII ranking is owing to the immense knowledge capital, the vibrant start-up ecosystem, and the amazing work done by the public and the private research organizations and also takes **2nd place in the lower middle-income group**.
- India has also been portrayed as successful in developing sophisticated services that are technologically dynamic and can be traded internationally. It continues to lead the world in the **ICT services exports indicator (1st)** and holds top ranks in other indicators, such as **Domestic industry diversification (12th)** and **Graduates in science and engineering (12th)**. India's **innovation performance is above the average for the upper middle-income group in five of the seven innovation pillars** (it scores below average in the pillars of Infrastructure and Creative outputs).
- The report also noted **new science and technology (S&T) clusters** are emerging while China made the most consistent rank improvements **Delhi, Mumbai and Istanbul also advanced strongly this year**. The top 100 S&T clusters are **hosted by 26 economies**, of which 6 – Brazil, China, **India**, the Islamic Republic of Iran, Turkey and the Russian Federation – are middle-income economies.
- It can concluded that innovation has been at the forefront of our battle against the unprecedented crisis created by the pandemic, and will also remain pivotal in driving the country's resilience and

self-reliance, as enshrined in the Prime Minister Shri Narendra Modi’s clarion call on “**Atma Nirbhar Bharat.**”

- **Important indicators:**

Infrastructure – 81st from 75th in 2020

Knowledge & Tech outputs – 29th from 27th in 2020

Market sophistication – 28th from 31st in 2020

Business Sophistication - Assesses how conducive firms are for innovation in promoting activities – 52nd from 55th in 2020

Institutions – 62nd from 61st in 2020

Human Capital & Research – 54th from 60th in 2020

Creative Output – 68th from 64th in 2020

Top three innovation economies by region

Europe

- 1 Switzerland
- 2 Sweden
- 3 United Kingdom

Northern America

- 1 United States of America
- 2 Canada

Latin America and the Caribbean

- 1 Chile
- 2 Mexico
- 3 Costa Rica

Central and Southern Asia

- 1 India
- 2 Iran (Islamic Republic of)
- 3 Kazakhstan

South East Asia, East Asia, and Oceania

- 1 Republic of Korea ↑
- 2 Singapore ↓

Top three innovation economies by income group

High-income

- 1 Switzerland
- 2 Sweden
- 3 United States of America

Upper middle-income

- 1 China
- 2 Bulgaria ↑
- 3 Malaysia ↓

Lower middle-income

- 1 Viet Nam
- 2 India ↑
- 3 Ukraine ↓

Low-income

- 1 Rwanda ↑
- 2 Tajikistan ☆
- 3 Malawi ☆

3. Sector-Wise Innovations leading towards Atma Nirbhar Bharat

Biotechnology Sector

- The Department of Biotechnology has initiated a new program on "**Drug Development**" in collaboration with the BIRAC. It is aimed at reducing the disease burden, providing treatment options for these priority diseases and **putting India on the global map in terms of R&D innovation in the area of drug development.**
- The Department of Biotechnology under the Innovations partnership with **VINNOVA, Sweden** has announced a joint call for proposals on "**Artificial Intelligence for Advancing Healthcare**

across India and Sweden". The joint call aims to ensure sustainable and equitable spread of technology in advancing healthcare access and affordability. The Department envisages developing scalable and implementable **innovative, sustainable and flexible public health solutions using AI-based technologies as a tool.** They have signed 26 proposals which were evaluated by a technical advisory committee.

- The Department of Biotechnology partnered **European Commission** for **collaborative research** about the '**Green Deal: Building a low-carbon, climate-resilient future program**'. This program will generate essential knowledge to achieve Sustainable Development Goals.
- **UKRI (MRC, ESRC)** and the Department of Biotechnology (DBT), India invited proposals to the **UK-India Covid-19 Partnership Initiative**. This initiative will provide **funding for collaborative research** projects with potential to deliver **public health impacts in mitigating the severity of the COVID-19 outbreak** in both the UK and India.
- **Indian Centric Epidemic Preparedness (IndCEPI)** - A training program for "**Strengthening clinical trial research capacity in neighborhood countries**". It will build capacity in neighborhood countries and LMICs (Low and Middle Income Countries) for COVID-19 vaccine trials.
- Mission **COVID Suraksha** was announced with a provision of INR 900 cr. to DBT for supporting the development of a comprehensive ecosystem for enabling the development of a safe, efficacious and affordable vaccine for COVID-19.
- The DBT has **developed bio-clusters** across India. These bio-clusters provide the industry with the technology development and translation network that can establish India as a **world-class bio-manufacturing hub.11 under the "Startup India Initiative"**, the DBT is setting up a bio-cluster in Pune and BIRAC is supporting the development of 4 additional bio-incubators during 2018 through BioNEST scheme.
- BIRAC has launched an **Equity based fund - AcE (Accelerating Entrepreneurs) Fund**. An equity fund addresses to accelerate the growth of entrepreneurs in the field of biotechnology by lending funding support of up to - **USD 150,000 for promising ventures.**
- The first **Clean Energy International Incubator** has been set up under **Mission Innovation**. The programme allows for start-ups from **23 participating European Union countries** to come and **incubate in India** and likewise start-ups from this incubator can go to the partnering countries, thus facilitating access to global opportunities.
- Department of Biotechnology signed MoA with CNRS France for Covid 19 vaccine.
- **Accelerated Translational Grant for Commercialization (ATGC)** has been launched to encourage technological innovation by providing funding opportunities for fundamental research that is aimed towards application development.
- The Department of Biotechnology has established **Biotechnology Parks/Incubators** across the country to provide infrastructure support for development of products and services. The Biotechnology parks offer facilities to scientists and Small and Medium Sized Enterprises (SMEs) for technology incubation, technology demonstration and pilot plant studies for quicker commercial development of Biotechnology. So far, the department has set up nine parks in various states: **9 have already been established.**
- Under the Atma Nirbhar Bharat this sector has been granted funds for further augmentation of the sector.

Automobile

- India gets Asia's longest and world's fifth-longest High-Speed Track for automobiles.
- The **International Centre for Automotive Technology (ICAT)** is a top-class automotive testing, certification and R&D service provider under the support of National Automotive Testing and R&D Infrastructure Project (NATRiP), Government of India.
- **Fame India Scheme II Phase:** implemented over a period of 3 years with a financial outlay of INR 10,000 cr, for **faster adoption of electric mobility and growth of electric and hybrid technology** to improve the eco-system in the country.
- Government has **approved Production Linked Incentive (PLI) Scheme for Auto Industry including the components**, PLI Scheme for auto sector will bring **fresh investments of over ₹42,500 crore in 5 years** and incremental production of over ₹ 2.3 lakh crore.
- Further the government has given incentives to R&D incentives for industry and private sponsored research, manufacturers with in-house R&D centre – tax incentive, export incentives, area based incentives.

Aviation

- **GPS-Aided Geo Augmented Navigation (GAGAN)** is **India's first Satellite-based Augmentation System**. It provides additional accuracy for safety in civil aviation and has expansion capability for seamless navigation services across geographies.
- **No Objection Certificate Application System (NOCAS)** streamlines the online process of timely NOC for height clearances of buildings around airports.
- **eGCA** - The function & process of Directorate General of Civil Aviation (DGCA) is being moved to an **online platform to provide faster delivery of services & regulation oversight**. The e-GCA was initiated on 14th May 2019.
- To fulfil the dream of **“Atma Nirbhar Bharat”** the Ministry of Civil Aviation shared incentives of Rs 120 cr to be given in next 3 years under PLI scheme for drones and drone components.

Chemicals

- Prime Minister, Shri Narendra Modi has introduced the Production-Linked Incentive (PLI) Scheme in **Advance Chemistry Cell Battery for Enhancing India's Manufacturing Capabilities and Enhancing Exports** and to take it towards **“Atma Nirbhar Bharat”** with a financial outlay of Rs 18,100 Cr. The Government has also proposed a **National Policy on Petrochemicals** which aims to achieve sustainable development for the petrochemical industry by **promoting research and development and human resource planning and development** to cater the needs of the industry by adopting a mission mode approach and Centre(s) of Excellence (COE) are being set up for this reason.

Construction

- **Global Housing Technology Challenge-India (GHTC-I)** aims to bring the most **innovative construction technologies** to India through a competitive platform. It aims to give a boost

through the development of domestic technological research, and building platforms for knowledge sharing and networking across the sector.

Defence

- Defence Procurement Procedure (DPP) has been revised in 2016 and special provisions for simulating growth of domestic defence industry have been introduced. It focuses on institutionalizing, streamlining and simplifying defence procurement procedure to give a boost to “Make in India” initiative. It aims to promote indigenous design, development and manufacturing of defence equipment, platforms, systems and sub-systems. It also aims to enhance the role of MSMEs in the Defence industry. A new category of capital procurement: **Buy Indian - Indigenously Designed, Developed and Manufactured (IDDM)** has been introduced to encourage indigenous design, development and manufacturing of defence equipment.

Electrical Machinery

- Prime Minister, Shri Narendra Modi has introduced the **Production-Linked Incentive (PLI) Schemes for Large Scale Electronics Manufacturing and IT Hardware** for Enhancing India’s Manufacturing Capabilities and Enhancing Exports – **Atma Nirbhar Bharat**. MeitY may keep Rs 7,500 cr outlay for IT Hardware Manufacturing under PLI Scheme which is further facilitating hardware in IT industry.

Electronics

- The Government is promoting the development of Electronics Manufacturing Clusters (EMCs) throughout the Country to provide world-class infrastructure and facilities.
- MeitY announced a **#FOSS4GOV Innovation Challenge** to accelerate the **adoption of Free and Open Source Software (FOSS) In Government**. It aims to submit implementable open-source product innovations in CRM and ERP with possible applications for Govtech in Health, Education, Agriculture, Urban Governance etc.
- **100% Foreign Direct Investment (FDI)** is allowed under the Automatic Route in the ESDM industry
- The **National Policy on Electronics (NPE) 2019** envisions **positioning India as a global hub for ESDM** by encouraging and driving capabilities in the country for developing core components, including chipsets and by creating an enabling environment for the industry to compete globally.
- **Electronics Development Fund (EDF)**: This Scheme helps **promote start-ups and innovation**. The EDF is a fund of funds that invests in venture funds, which in turn invest in innovation ventures/ start-ups in electronics, nano-electronics and IT. The EDF will invest about INR 659 cr in 11 Daughter Funds
- Prime Minister Shri Narendra Modi has approved **PLI Scheme in Electronics System Sector** through the MeitY with a financial outlay of **Rs 5000 cr over a five-year period** for Enhancing India’s Manufacturing Capabilities and Enhancing Exports – **Atma Nirbhar Bharat**.

Information & Technology

- India is **third largest Unicorn hub globally** with a total valuation of **USD 168 bn**. It is also the **2nd largest start-up ecosystem** in the world with 18,000+ start-ups recognized by the government till May 2019.
- Under Production Linked Incentive (PLI) Scheme for IT Hardware Products with incentives worth Rs 7,325 cr will be provided over four years for manufacturing of these products in India – **Atma Nirbhar Bharat**
- **National Policy on Software Products (2019):** A dedicated **Software Product Development Fund (SPDF)** with a corpus of USD 145.65 mn will be created in the form of **Fund of Funds**.
- It can be observed that the **fastest growing fields in this sector are Telecom and Semiconductors**.
- Prime Minister Shri Narendra Modi signed bilateral **Memorandum of Cooperation (MoC) between India and Japan** in the field of **Information and Communication Technologies (ICTs)**. This MoC will boost opportunities for India to get into the global standardization process. This will further **enhance human capacity building and development of the startup ecosystem** which will contribute in realizing the objectives of **Atma Nirbhar Bharat**.

Oil & Gas

- **National Data Repository (NDR)** was set up on 28 June 2017, at the Directorate General of Hydrocarbons (DGH), to make the **entire Exploration and Production (E&P) data available**. This is mainly for commercial exploration, **research and development and academic purposes**.
- **SATAT (Sustainable Alternative Towards Affordable Transportation):** The target is to have **5000 compressed biogas plants** of 15 MMT per year with an investment potential of US \$ 20 bn. It aims to set up Compressed Bio-Gas production plants and make CBG available in the market for use as a **green fuel**.

Pharmaceuticals

- The sector is supported by the following Production Linked Incentive (PLI) Schemes to boost domestic manufacturing capacity, including high-value products across the global supply chain – Atma Nirbhar Bharat. It has two components: one is the **PLI Scheme for Key Starting Materials (KSMs)/Drug Intermediates (DIs) and Active Pharmaceutical Ingredients (APIs)** and the other is related to the **Production-Linked Incentive (PLI) Scheme for Pharmaceuticals (PLI 2.0)** with a combined financial outlay of Rs 21,940 cr.
- The National Telemedicine Service "**e-Sanjeevani**" is a digital health initiative of the Ministry to implement **tele-consultation** in all the 1.5 lakh Health and Wellness Centres in a 'Hub and Spoke' model, by December 2022. e-Sanjeevani has crossed another milestone by completing **7 million consultations**.

Textiles & Garments

- Prime Minister, Shri Narendra Modi has approved the Production-Linked Incentive (PLI) Scheme in Textiles Products for Enhancing India's Manufacturing Capabilities and Enhancing Exports – **Atma Nirbhar Bharat** with a financial outlay of Rs 10,683 cr. It is applicable to man-made fibre segments and technical textiles.

- **National Technical Textiles Mission (NTTM):** With the four-year implementation period from 2020-21 to 2023-24 with an estimated outlay of about USD 197.33 mn. It focuses on **research and innovation and indigenous development of speciality fibres.**

Renewable Energy

- Prime Minister, Shri Narendra Modi has introduced the Production-Linked Incentive (PLI) Scheme in **High-Efficiency Solar PV Modules for Enhancing India’s Manufacturing Capabilities and Enhancing Exports – Atma Nirbhar Bharat** with a financial outlay of Rs 4,500 cr.

Space

- ISRO has been undertaking the development of cutting-edge technologies and interplanetary exploratory missions, there is a tremendous scope in contributions to the realization of operational missions and new areas such as satellite navigation.
- Mars Orbiter Mission (MOM) or Mangalyaan, Chandrayaan-2 Mission (India's 2nd mission to the moon), AstroSat Mission (India’s 1st observatory mission for astronomy) and the Aditya-L1 Mission (India’s 1st solar observatory in space).
- India's most powerful launch vehicle, GSLV-MK III capable of launching 4 tons of satellites into Geosynchronous Transfer Orbit (GTO) was successfully launched in **July, 2019.**
- **The Draft Space Com Policy- 2020 published by the** Department of Space aims to meet the growing demand of space based communication requirements of the nation. This will boost Government’s initiatives towards Atma Nirbhar Bharat that will focus on “ease of doing business” and encourage healthy competitiveness in the growth of the national economy.
- **National Language Translation Mission (NTLM)** to make governance-and-policy related knowledge available in major Indian languages.
- **PSLV-CS51** to be launched by New Space India Limited (NSIL) carrying Brazil’s Amazonia Satellite & some Indian satellites.
- 4 astronauts are being trained in Russia for **Ganganyaan Mission.**
- First unmanned launch is slated for **December 2021.**
- Rs 4000 Cr over 5 years for **Deep Ocean Mission survey** exploration and conservation of deep-sea biodiversity.
- **First digital census** – Rs3,768 Cr.
- To encourage filing of international patents, a scheme to **Support International Patent Protection in Electronics & IT (SIP-EIT)** has been commissioned. The Scheme provides financial support to Small and Medium Enterprises (SMEs) and tech start-ups by supporting international patent protection in electronics and IT.

Railways

- The Indian railways have set up the country’s first **Waste to Energy plant in Bhubaneswar.** Based on its patented technology called **POLYCRACK**, the plant has a capacity of 500 Kgs waste per day. The technology is **the world’s first patented heterogeneous catalytic process.**

- It has created a new world benchmark by successfully running **1st Double Stack Container Train in high rise Over Head Equipment (OHE)** electrified sections, having a contact wire height of 7.57 metre. This achievement will also boost the Green India mission.
- It has also operationalised its **First 12000 HP locomotive**. For the first time in the world, a high horsepower locomotive has been operationalised on a broad gauge track. The locomotive has been produced under the Make in India initiative, and India has become the **6th country to join the elite club of producing high horsepower locomotive indigenously**.

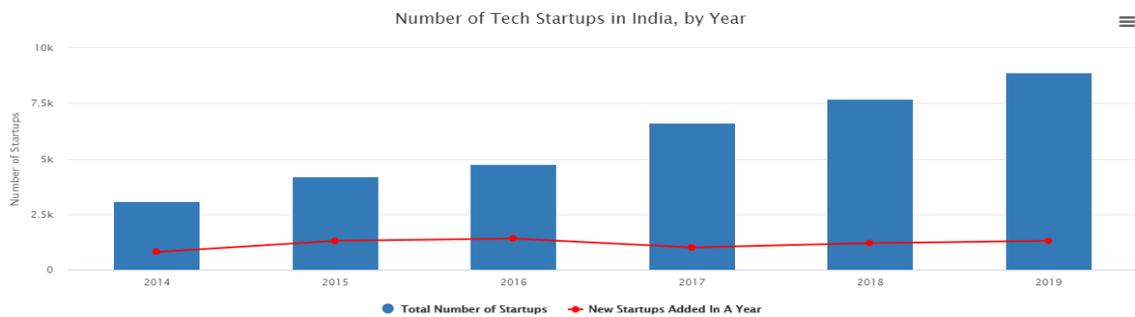
4. Status of Start-Ups in India

- Government of India set up a venture ecosystem as a flagship strategy and launched a startup supporting measure. India has the 3rd largest startup ecosystem in the world; expected to witness YoY growth of a consistent annual growth of 12-15%. That pace of growth in the startup ecosystem has increased and the growth of the number of incubators and accelerators has also grown. Significantly, the number of women entrepreneurs is also showing a promising sign. The Indian startups have raised sizeable ticket sizes from various global and domestic funds. The top 15 deals constituted about 40% of total deal value, demonstrating that most funds are valuing deal quality more than quantity.
- India is **ranked 20** in the **Global Start-up ecosystem structure**, as per the **StartupBlink report** of 2021. Three Indian cities – **Bengaluru, New Delhi, and Mumbai** - rank amongst the top 20 in the startup landscape of the world. Bangalore has been listed within the world's 20 leading startup cities in the 2019 Startup Genome Project ranking.
- **As on June 3, 2021, 50,000 startups across have been recognized as startups by DPIIT**, of which **19,896** have been recognized since **April 1, 2020**.
- With the launch of the Startup India initiative, recognized startups have now spread **across 623 districts**. **Each State and UT has at least one startup**. **30 States and UTs** have announced specific Startup Policies to support startups.
- Notably, it took only **180 days to add the last 10,000 startups (June, 2021)**, as compared to 808 days for the first 10,000 at the beginning of the initiative. **743 startups** were recognized in **2016-2017**, in the first year of the initiative, which has now increased exponentially to over **16,000 startups being recognized in the year 2020-2021**.
- Entrepreneurs now have options to avail benefits across a range of laws, regulations, fiscal and infrastructural support, leading to a surge in startup ecosystem growth.
- The recognized startups have contributed significantly to job creation, with **5,49,842 jobs** reported by **48,093 startups** with an average number of 11 employees per startup. About **1.7 lakh jobs were created by recognized startups in the 2020-2021 period alone**.
- The sectors that had the maximum registered startups were **'Food Processing', 'Product Development', 'Application Development', 'IT Consulting' and 'Business Support Services'**. The leadership teams of **45% startups have a women entrepreneur**, a trend which will inspire more women entrepreneurs to turn their ideas into startups.
- Funding opportunities to startups have been enhanced through the **Fund of Funds Scheme with an overlay of Rs 10,000 crore** and the recently launched **Startup India Seed Fund Scheme (SISFS) with an outlay of Rs 945 crores**.

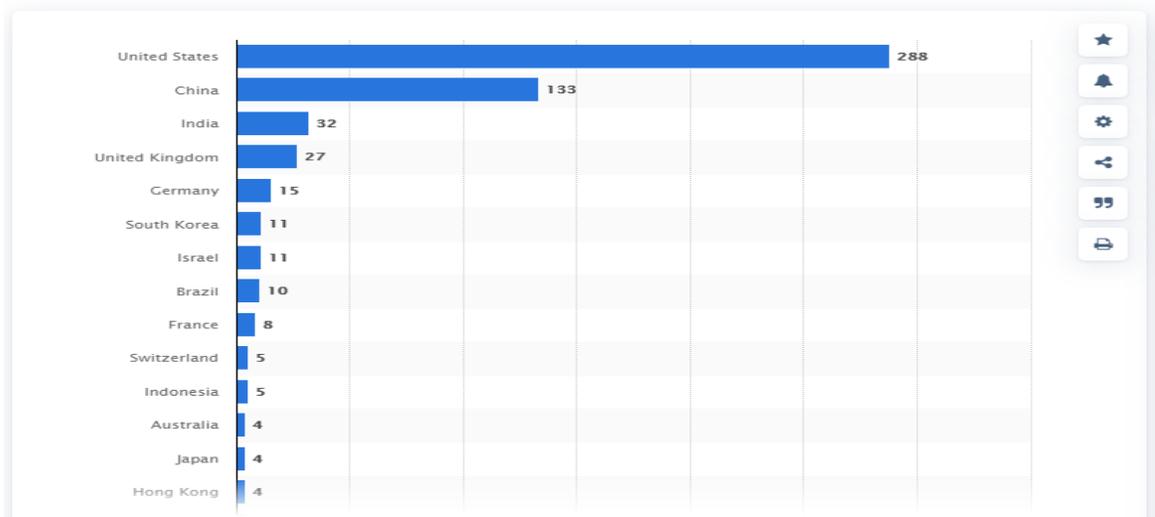
- The **Israel-India Innovation Bridge**, **India-Singapore Entrepreneurship Bridge**, **India-Portugal Start-up Hub**, and **India-Sweden Start-up Sambandh** have been formulated to facilitate **bilateral cooperation in the innovation domain** with other countries.
- To accelerate the startup ecosystem in India, initiatives, such as **reduction of corporate tax** by 25 percent for companies with turnover of US\$ 33 million, **US\$ 27 million allocation to Atal Innovation Mission** with a target of setting **600 new Atal Tinkering Labs in 1500 schools** across India, **US\$ 100 million to 70 technology incubators** and about **US\$ 13 million for the entrepreneurship schemes**. India is also an active member in the **Mission Innovation**, a global initiative comprising 24 countries and the European Union working to accelerate the clean energy innovation, including smart grids and off-grid access to electricity, energy generation, transmission and energy storage.

Number of Tech Startups In India by Year: 2014 – 2019

The below graph represents the total number of tech startups in India, by year. Indian start-up ecosystem continues to be the 3rd largest in the world, with over 8900+ startups were incepted during 2014-19.



Number of unicorns worldwide as of April 2021, by country



5. Government Schemes for encouraging the Innovative eco-system:

- The Government of India has taken many initiatives in the last few years to drive the nation on the path of innovation and creating a conducive ecosystem. Some of these are - Start-up India, Accelerating Growth of New India's Innovations (AGNII), ASPIRE Scheme, Smart City Mission, Uchchar Avishkaar Yojana, Make in India, Start-Up India Initiative, Atal Incubation Centre (AIC), Atal Innovation Mission (AIM), Atma Nirbhar Bharat. It is worth special mention that the government under the leadership of Prime Minister Shri Narendra Modi has brought out schemes for women entrepreneurs (WEP) which is leading to empowerment of women. It also provides financial support from innovation to commercialization and extends various fiscal concessions to industry. All these efforts are showing results & are leading the country into becoming the global innovation and knowledge hub and is developing a spirit of inquiry and fostering an ecosystem of innovations.
- Another initiative is the Central Government's **New Education Policy 2020**. This path-breaking policy has provisions for some radical changes. Its pivotal focus is on optimizing use of resources, academic flexibility, critical thinking, experiential learning, interactive classrooms, integrated pedagogy, inter/trans-disciplinary approach for competency, and outcome-based student-centric 21st century education. This is expected to spur applied learning, innovation and an entrepreneurial culture in the Higher Education Institutions (HEIs). The Government is now in the process of framing its **Science, Technology, and Innovation Policy (STIP 2020)**. These policies are expected to create an atmosphere conducive for more innovations and are crucial steps towards revamping the Indian education system.
- It can be recalled that 2019 the Prime Minister's Research Fellowship (PMRF) scheme was launched with an outlay of US\$ 250 million—it is designed to attract the talent pool of the country to pursue doctoral programmes in top academic institutions. Meanwhile, in 2015, the Impacting Research Innovation and Technology (IMPRINT) programme was set up with an outlay of US\$ 155 million aim to address the most relevant challenges in the field of engineering, technology, and self-reliance for translating research knowledge into viable technology products and processes. Prime Minister Narendra Modi has himself spoken on embracing latest technology as “**AI driven e-governance**” at the **Responsible AI for Social Empowerment (RAISE)** Virtual Summit in 2020.
- **Atal Ranking of Institutions on Innovation Achievements (ARIIA):** Considering our potential and necessity to innovate, the Ministry of Education, Government of India has launched a **unique annual ranking programme** ATAL Ranking of Institutions on Innovation Achievements (ARIIA), in 2018, to systematically rank all higher education institutions in India **based on their innovation achievements and on campus start-up ecosystems**. ARIIA ranking is expected to inspire HEIs to reorient their mind-set and restructure their programmes; as well as create ecosystems to encourage high quality research, innovation and entrepreneurship. The Government of India had announced the first ARIIA awards in April 2019.
- **Technology Driven Education with Equity post-COVID: PM e-VIDYA**, a programme for multi-mode access to digital/online education to be launched immediately.
- **Startup India:** It is a flagship initiative of the Government of India launched by the Prime Minister Shri Narendra Modi on 16 January, 2016. The initiative is intended to catalyse startup culture and build a strong and inclusive ecosystem for innovation and entrepreneurship in India.

Department for Promotion of Industry and Internal Trade (DPIIT) acts as the nodal Department for the Startup initiative.

- **SAMRIDH Scheme:** Ministry of Electronics Information and Technology (MeitY) launched the SAMRIDH scheme, which stands for Startup Accelerators of MeitY for Product Innovation, Development, and Growth on **August 25, 2021**. It is designed to **provide funding support to startups** along with helping them bring skill sets together which will help them grow successful. The newly launched SAMRIDH program also aims to focus on the **acceleration of around 300 start-ups** by extending them with customer connect, investor connect, and other opportunities for international expansion in the upcoming three years that will follow.
- **Startup India Seed Fund:** On **16 January 2021**, Prime Minister Narendra Modi announced the launch of the '**Startup India Seed Fund**' — worth **Rs 1,000 crores** — to help startups and support ideas from aspiring entrepreneurs. Prime Minister Modi said that the government is taking important measures to ensure that startups in India do not face any capital shortage.
- **A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship (ASPIRE):** The ASPIRE scheme aims at increasing employment, reducing poverty, and encouraging innovation in rural India.
- **ATAL Innovation Mission:** Atal Innovation Mission was launched in **2015** to create a promotional platform involving academicians and draw upon national and international experiences to foster a culture of innovation, research, and development.
- **Multiplier Grants Scheme (MGS):** Department of Electronics and Information Technology (DeitY) started the Multiplier Grants Scheme (MGS). This scheme aims to encourage collaborative Research & Development (R&D) between industry and academics/institutions for the development of products and packages. Under the scheme, if the industry supports the R&D of products that can be commercialized at the institutional level, the government shall provide financial support which will be up to twice the amount provided by industry. MGS promotes and expedites the development of aboriginal products and packages.
- **NewGen Innovation and Entrepreneurship Development Centre (NewGen IEDC):** NewGen IEDC is an initiative launched by the National Science and Technology Entrepreneurship Development Board under the Department of Science and Technology, Government of India. The initiative aims to inculcate the spirit of innovation and entrepreneurship among the Indian youth. It also endeavors to support and encourage entrepreneurship through guidance, mentorship, and support.
- **High Risk - High Reward Research:** The High Risk and High Reward Research is a scheme launched by the Indian government to support and invite new proposals and ideas that have the potential to usher a paradigm shifting influence on the Science and Technology domains. This funding focuses on the new proposals, which might be conceptually new and risky but are expected to have a paradigm shifting influence on the S&T, in terms of formulating new hypotheses or scientific breakthroughs, which might help in the emergence of new technologies.
- **Other schemes which encourage an ecosystem for an economy to be driven by innovations include:** Prime Minister Mudra Yojana, Dairy Entrepreneurship Development Scheme, Promoting Innovation in individuals, Start-ups & MSMEs – PRISM, SPARSH, Technology Development Program, SMILE, Start Up assistance Scheme, Atal Tinkering Lab, Credit linked Capital Subsidy for Technology Up gradation, Support for International Patent Protection in Electronics & I.T, Software technology up gradation Scheme, Electronic Development Fund

Policy, Venture Capital Assistance Scheme, Credit Guarantee Scheme, Extra Mural Research Funding, SFURTI, Scheme to support IPR awareness in E&IT sector, Biotechnology Industry Partnership program, Small Business Innovation research Initiative etc.

6. Patents, Trademarks & Industrial Designs filed from 2014 to 2019

Sl. No.	Year	Patent	Trademark	Industrial Design
1	2014	22,444	237,484	8,021
2	2015	23,990	283,497	9,256
3	2016	25,853	294,412	7,882
4	2017	28,009	272,707	10,374
5	2018	30,035	333,447	15,211
6	2019	34,015	369,905	12,753

- Patents Applications:** It can be observed that the no of patents from residents have gone up while the Non-Resident remains more or so stable. However, the no. of patents granted to Residents as well as Non-residents has seen a rise during these years (following table)

Sl. No.	Year	Resident	Non-Resident	Abroad
1	2014	12,040	30,814	10,404
2	2015	12,579	33,079	11,411
3	2016	13,199	31,858	12,654
4	2017	14,961	31,621	13,048
5	2018	16,289	33,766	13,746
6	2019	19,454	34,173	14,561

Patent Grants:

Sl. No.	Year	Resident	Non-Resident	Abroad
1	2014	720	5,433	4,292
2	2015	822	5,200	4,999
3	2016	1,115	7,133	5,582
4	2017	1,712	10,675	5,800
5	2018	2,311	11,597	6,039
6	2019	3,690	19,888	7,114