CTIER CENTRE FOR TECHNOLOGY, INNOVATION AND ECONOMIC RESEARCH

States Snapshot

State Innovation Snapshot

The CTIER State Innovation Snapshot is the first in a series intended to provide readers with data on innovation systems across states, drawing on the latest work presented in our biennial publication, the CTIER Handbook: Technology and Innovation in India.

This snapshot presents a set of indicators, focusing on key aspects of the regional innovation systems across Indian states. The indicators highlight trends in R&D spending by state governments, the distribution of industrial R&D centres, startups (and new companies), incubation centres, and patents filed, among other indicators. While the current snapshot uses data from our 2025 Handbook, readers are encouraged to consult earlier editions to observe the evolution of the ecosystem since 2016.

Given the varying degrees of innovation capabilities and the different challenges they face, India’s regional innovation ecosystems are still evolving. As India seeks to achieve sustained high economic growth through innovation, this information can help align state-level strategies with national innovation ambitions, ensuring that each region contributes effectively to India’s broader technological and economic progress. This snapshot is intended to encourage the study of regional innovation systems by focusing on the innovative capabilities of firms and the institutions around them.

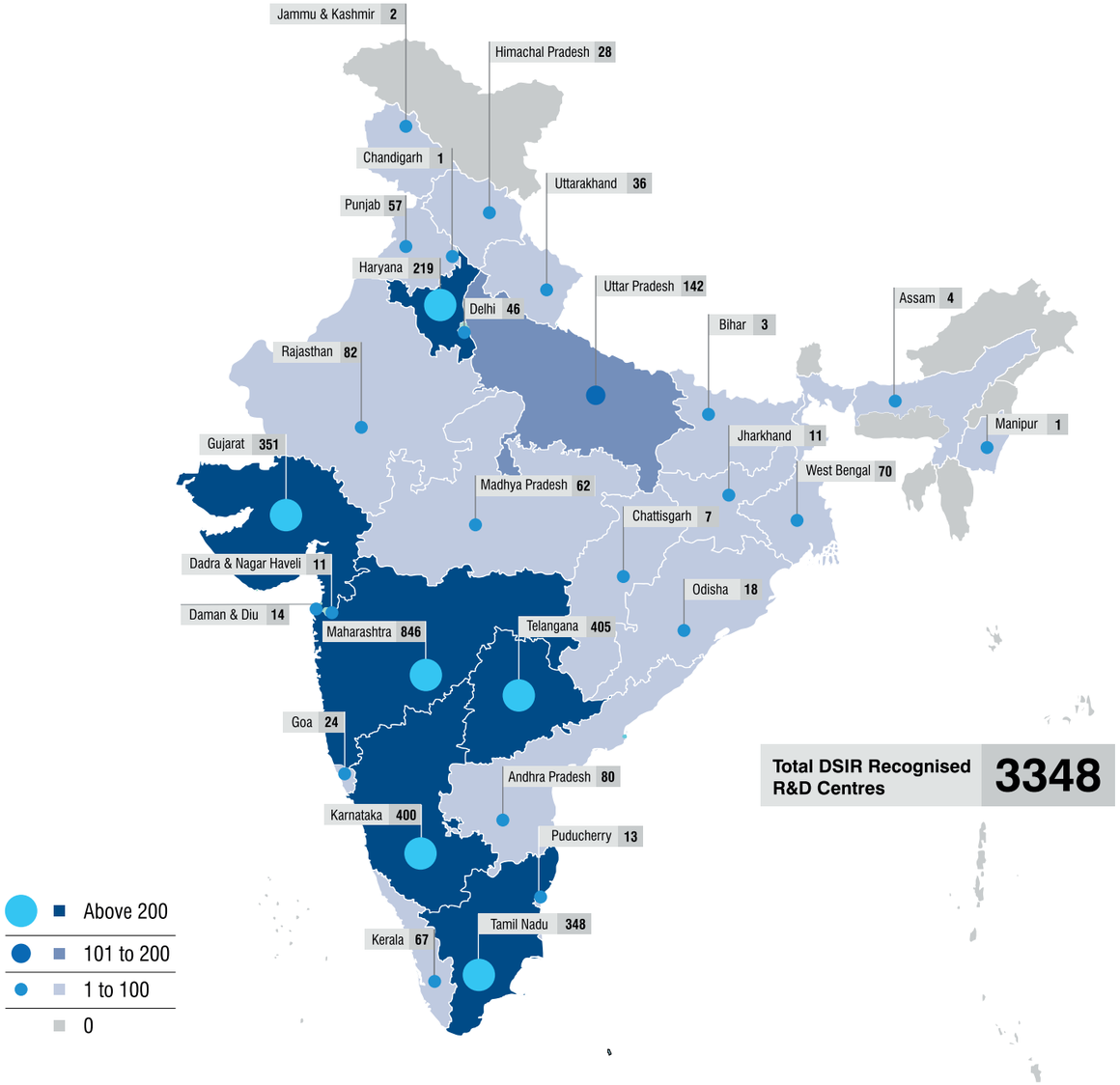
Maharashtra's share in total state R&D expenditure stood at 17 per cent in 2022-23

S. No.	State/Union Territory	Expenditure on R&D			
		2021–22		2022–23	
		(US$, Million)	(₹, Million)	(US$, Million)	(₹, Million)
1	Maharashtra	213	15868	310	24867
2	Gujarat	244	18156	262	21048
3	Tamil Nadu	133	9876	128	10287
4	Andhra Pradesh	87	6476	111	8894
5	Karnataka	99	7340	95	7660
6	Madhya Pradesh	51	3803	92	7355
7	Kerala	100	7448	85	6829
8	Assam	61	4518	68	5495
9	Odisha	62	4629	61	4918
10	Jammu and Kashmir	65	4824	58	4638
11	Telangana	63	4654	58	4636
12	Punjab	58	4346	55	4428
13	Uttar Pradesh	43	3199	49	3968
14	Bihar	42	3093	45	3637
15	Rajasthan	41	3031	44	3571
Total for Top 15 States		**1359**	**101261**	**1522**	**122231**
Total for All States		**1695**	**126248**	**1787**	**143510**

R&D expenditure here comprises two components, namely Science, Technology and Environment expenditure and Agricultural Research & Education expenditure.

- The total R&D expenditure by states in 2022-23 was USD 1,787 million (INR 144 billion) that accounted for around 8.7 per cent of India's national R&D expenditure
- Agricultural Research & Education expenditure accounted for 73 per cent of total R&D expenditure by state governments in 2022-23 while Science, Technology and Environment expenditure accounted for 27 per cent
- Maharashtra had the highest expenditure on R&D at USD 310 million in 2022-23 compared to USD 213 million in 2021-22, accounting for 17 per cent of total expenditure by all states in 2022-23. Gujarat had the second highest R&D expenditure with USD 262 million in 2022-23 compared to USD 244 million in 2021-22.

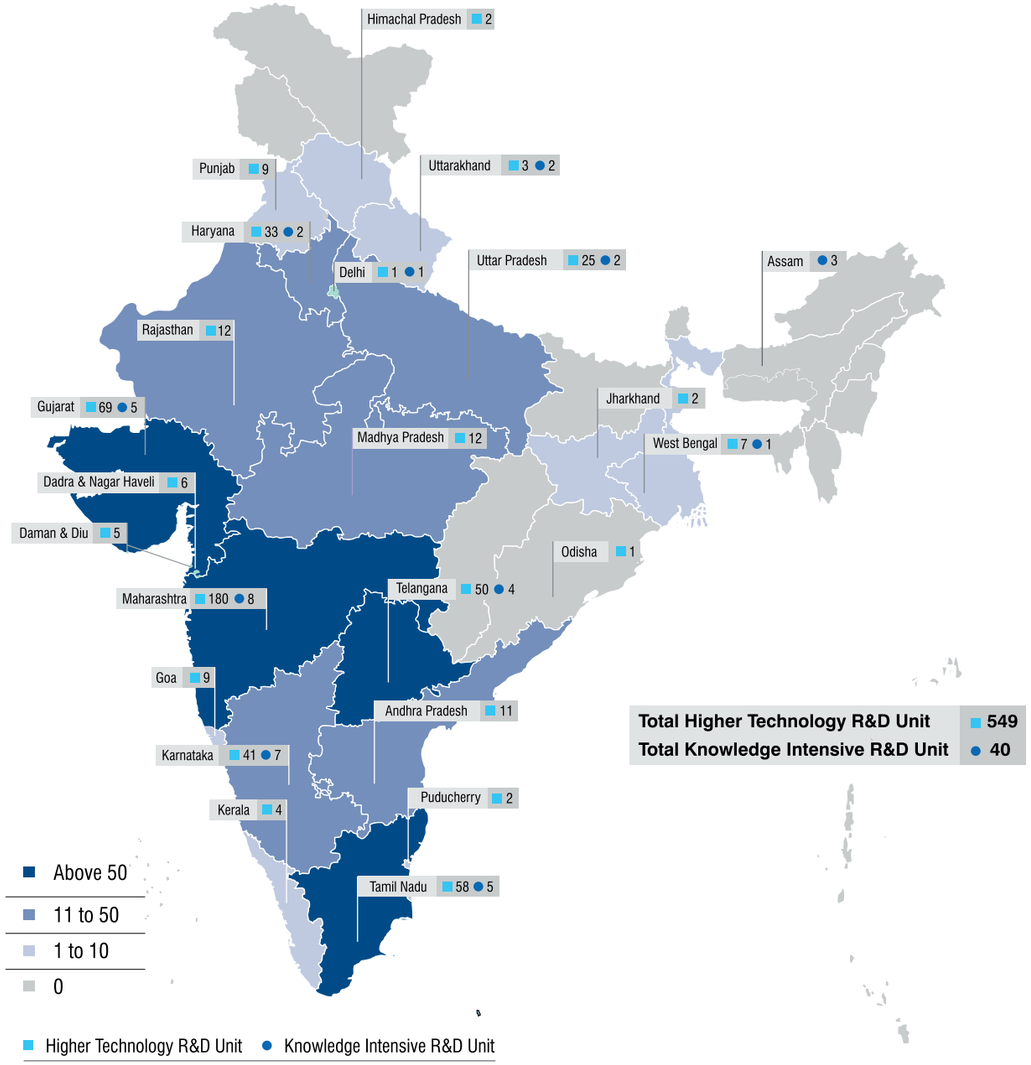
Top locations for DSIR recognised Industrial R&D units were in Maharashtra, Telangana, and Karnataka



The directories of in-house R&D units released by the Department of Scientific and Industrial Research (DSIR) in 2016, 2017, 2021, and 2024 published the locations of one or more registered in-house R&D units of 2,754 firms.

- The state-wise locations of 3,348 R&D units were identified and captured in this graphic. Maharashtra had 846 R&D units, the highest number amongst all states, and accounted for 25 per cent of the total DSIR recognised R&D Units. Some of the other top locations for the DSIR recognised R&D units were Telangana, Karnataka, Gujarat, and Tamil Nadu.

5 states account for 74 per cent of Higher Technology and Knowledge Intensive R&D units in India

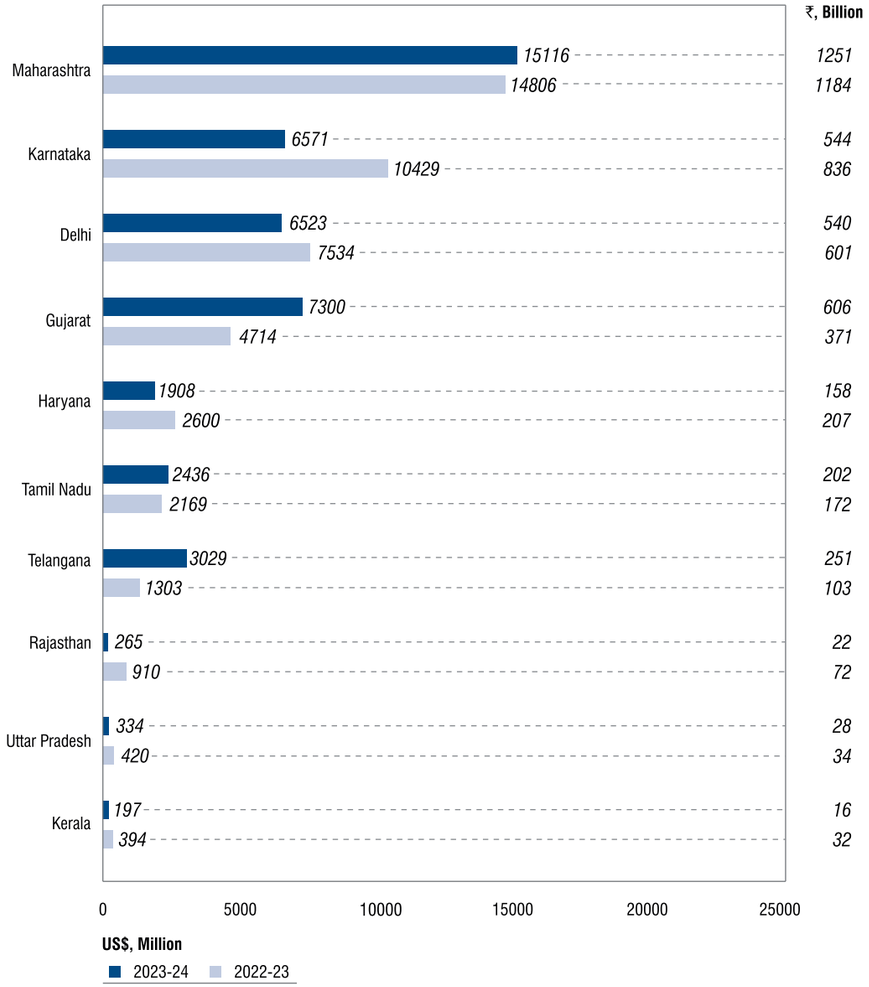


Total Higher Technology R&D Unit	**549**
Total Knowledge Intensive R&D Unit	**40**

The R&D units of 317 firms identified as Higher Technology and Knowledge Intensive[1] have been considered here. Maharashtra has the highest number of Higher Technology and Knowledge Intensive R&D units at 180 and 8 respectively.

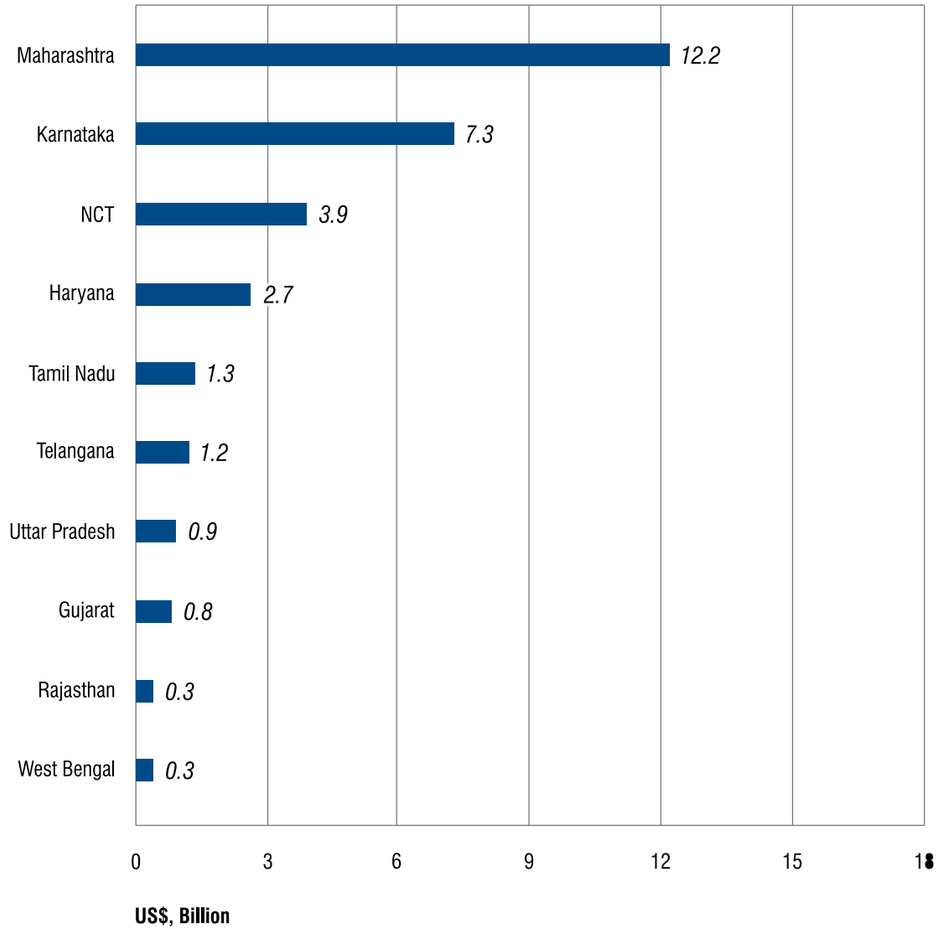
[1] The Higher Technology and Knowledge Intensive definitions are based on the International Standard Industrial Classification (ISIC) Rev 4.3.

Karnataka and Delhi saw a steep drop in FDI inflow in 2023-24



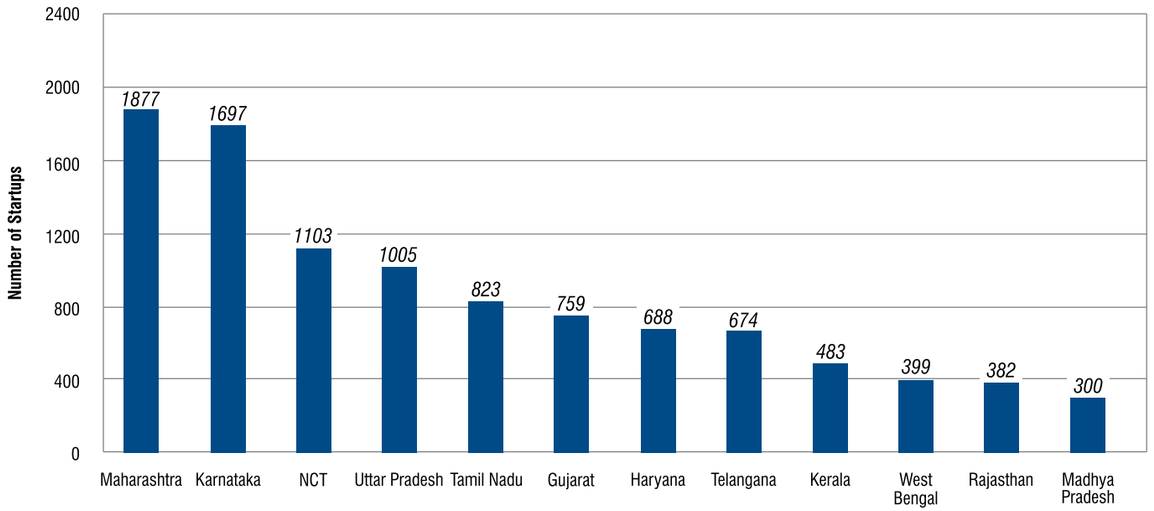
- In 2023-24, Maharashtra was the top state to receive FDI in India totalling FDI inflow of USD 15.1 billion.
- Gujarat received the second highest FDI inflow of USD 7.3 billion.
- Meanwhile, the states of Karnataka and Delhi saw the largest decrease in FDI inflows of USD 3.8 billion and USD 1 billion respectively compared to the previous year.

Maharashtra and Karnataka account for about 63 per cent of the funding for companies



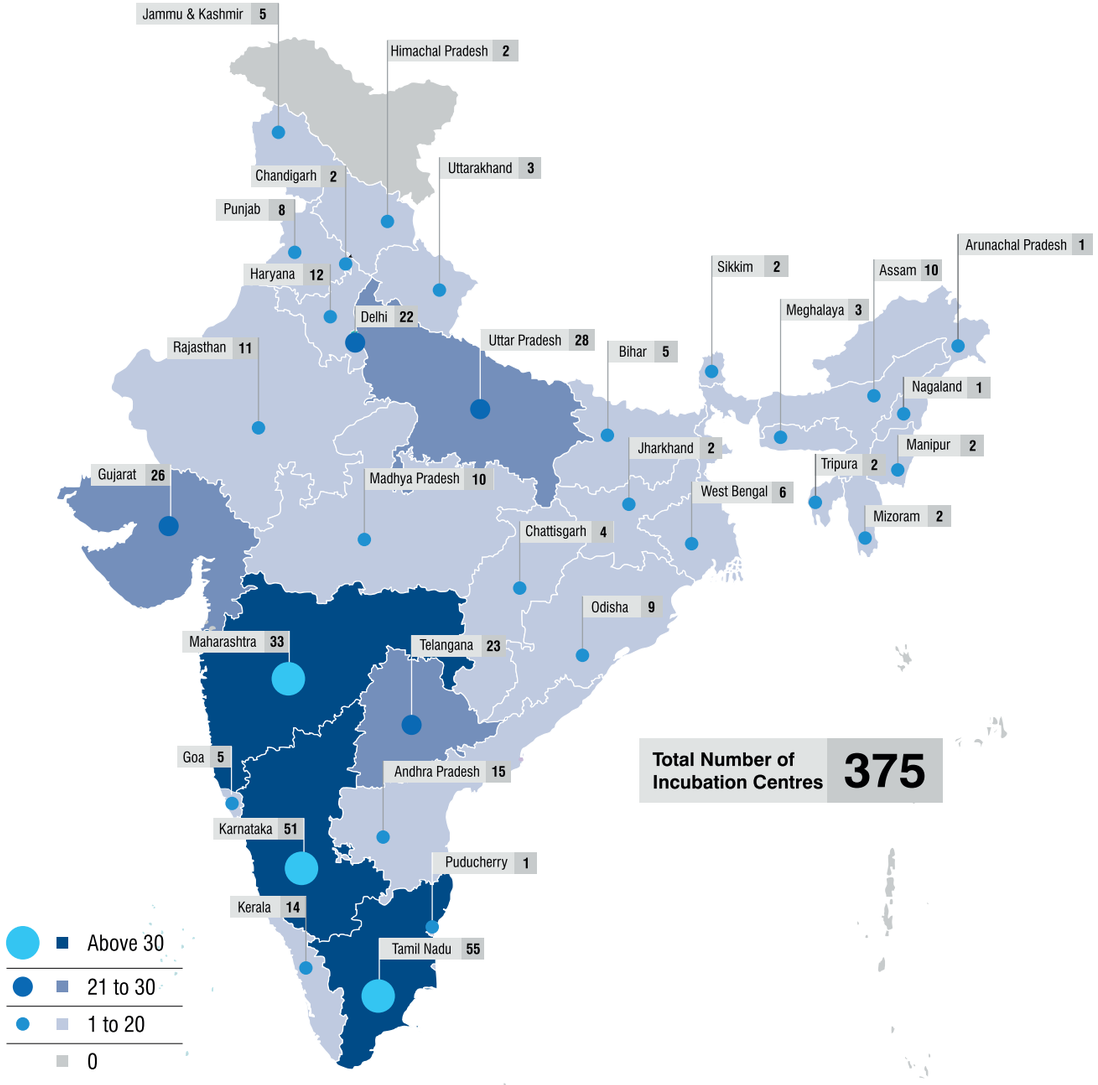
- In 2023, Maharashtra attracted the most funding for companies amounting to USD 12.2 billion
- This was followed by Karnataka that received USD 7.3 billion and National Capital Territory (NCT) that received USD 3.9 billion. Haryana followed in fourth place at USD 2.7 billion.
- The funding mentioned here is for all companies including startups (and new companies) and covers angel investments, conventional debt, venture debt, private equity, seed funding, and various series rounds as provided by Tracxn. Furthermore, the Tracxn data considered here includes funding for technology and offline companies.
- When one applies the criteria for startups (and new companies) that are founded in the last 10 years, the total funding amount received by Maharashtra was USD 2.7 billion in 2023 and the amount received by Karnataka was USD 3.7 billion

Maharashtra, Karnataka, NCT and Uttar Pradesh all saw 1000 plus startups (and new companies) established in 2023



- In 2023, Maharashtra saw 1,877 startups (and new companies) being established, followed by Karnataka that saw 1,697 startups (and new companies)
- The National Capital Territory (NCT) came in third with 1,103 startups, while Uttar Pradesh was fourth with 1,005 startups

Tamil Nadu hosts 55 incubators, with 43 located at academic institutions



- A total of 375 incubators were identified across India, of which 311 were supported by various government entities like the Department of Science and Technology (DST), the Ministry of Electronics and Information Technology (MeitY), the Atal Innovation Mission (AIM) and the Department of Biotechnology (DBT). Tamil Nadu had the highest number of incubators (55) followed by Karnataka (51)
- There were 235 incubators located at academic institutions. Tamil Nadu had 43 incubators located at academic institutions, highest in all states, followed by Karnataka that had 23.

Only four states received CSR funding towards technology incubators and public research institutions in 2022-23

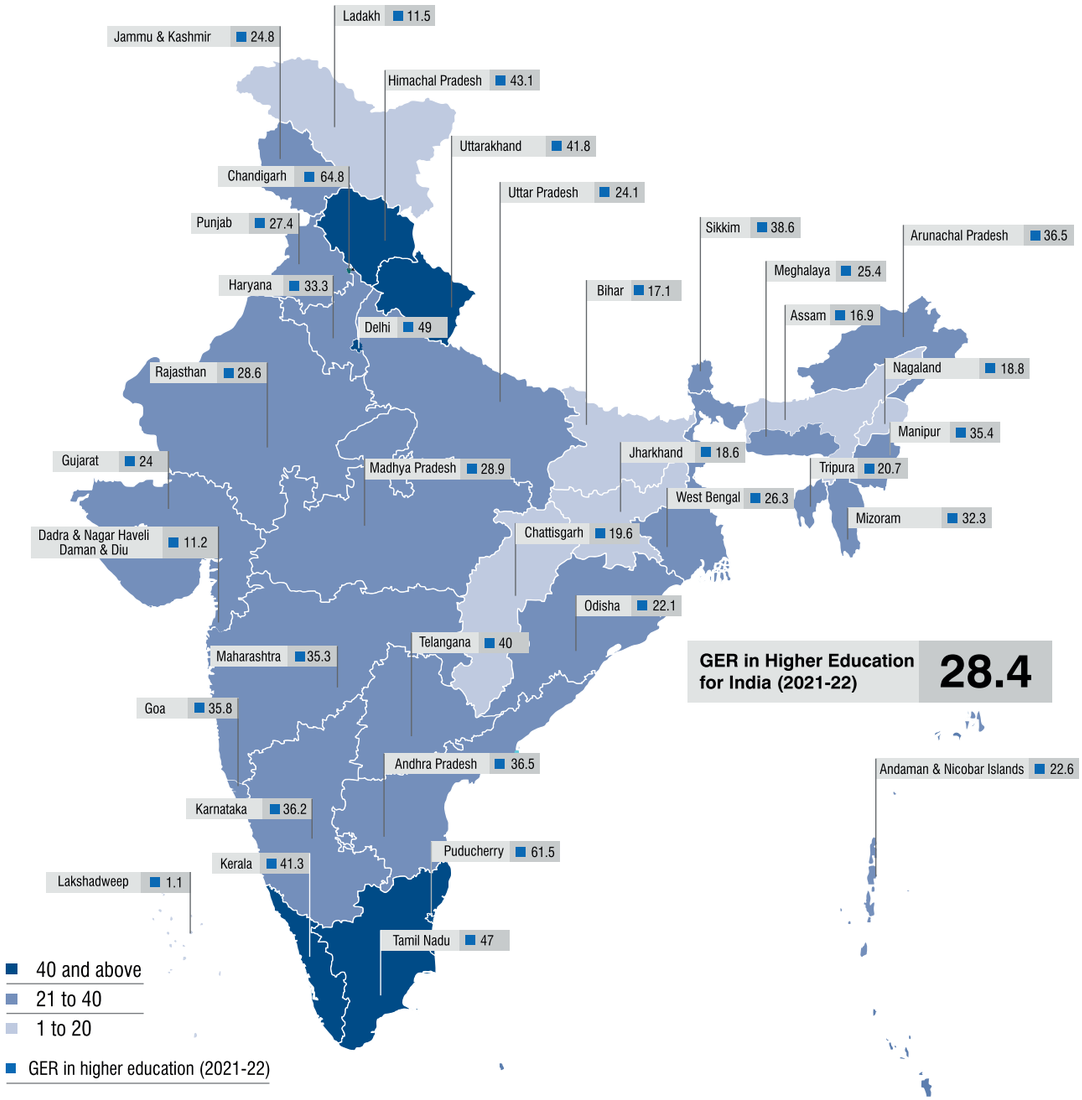
State	CSR funding towards Technology Incubators and Public Research Institutions and their share in total CSR funding										
	2018-19		2019-20		2020-21		2021-22		2022-23		Total 2018-19 to 2022-23
	Amount (US$, '000)	Share in Total (%)	Amount (US$, '000)	Share in Total (%)	Amount (US$, '000)	Share in Total (%)	Amount (US$, '000)	Share in Total (%)	Amount (US$, '000)	Share in Total (%)	Amount (US$, '000)
Maharashtra	526.3	0.1	2622	0.6	2795.4	0.6	324.8	0.05	7.5	0.001	6276
Karnataka	1486	0.8	533.1	0.3	590.1	0.3	26.8	0.01	83.4	0.03	2719.5
Tamil Nadu	672.2	0.5	866	0.6	658.8	0.4	34.9	0.02	47.3	0.02	2279.2
Delhi	193.1	0.2	306.1	0.3	343.5	0.4	324.8	0.2	0	0	1167.5
Telangana	121.6	0.2	108.6	0.2	429.7	0.5	158.4	0.2	3.7	0.003	822
Rajasthan	4.3	0.01	28.2	0.03	397.4	0.4	1.3	0.001	0	0	431.3
Gujarat	173.1	0.1	21.2	0.02	145.5	0.1	48.3	0.02	0	0	388
Uttar Pradesh	145.9	0.2	97.3	0.1	39.1	0.03	6.7	0.004	0	0	289
Kerala	95.8	0.2	5.6	0.01	47.2	0.1	0	0	0	0	148.6
Andhra Pradesh	15.7	0.02	83.2	0.1	9.4	0.01	6.7	0.01	0	0	115.1

The table shows the top 10 states that received CSR funding[2] towards technology incubators and public research institutions. The states were ranked based on the cumulative CSR funding towards technology incubators and public research institutions received by each state between 2018-19 and 2022-23.

- Of the ten states, only four states received CSR funding in 2022-23 towards technology incubators and public research institutions.
- Among these four states, Karnataka received the highest amount, totaling USD 0.08 million. Delhi, Rajasthan, Gujarat, Uttar Pradesh, Kerala, and Andhra Pradesh did not receive any CSR funding towards technology incubators and public research institutions in 2022-23.

[2] This indicator captures the funding towards technology incubators, public funded laboratories and public funded higher education institutions engaged in science, technology, engineering, and medicine.

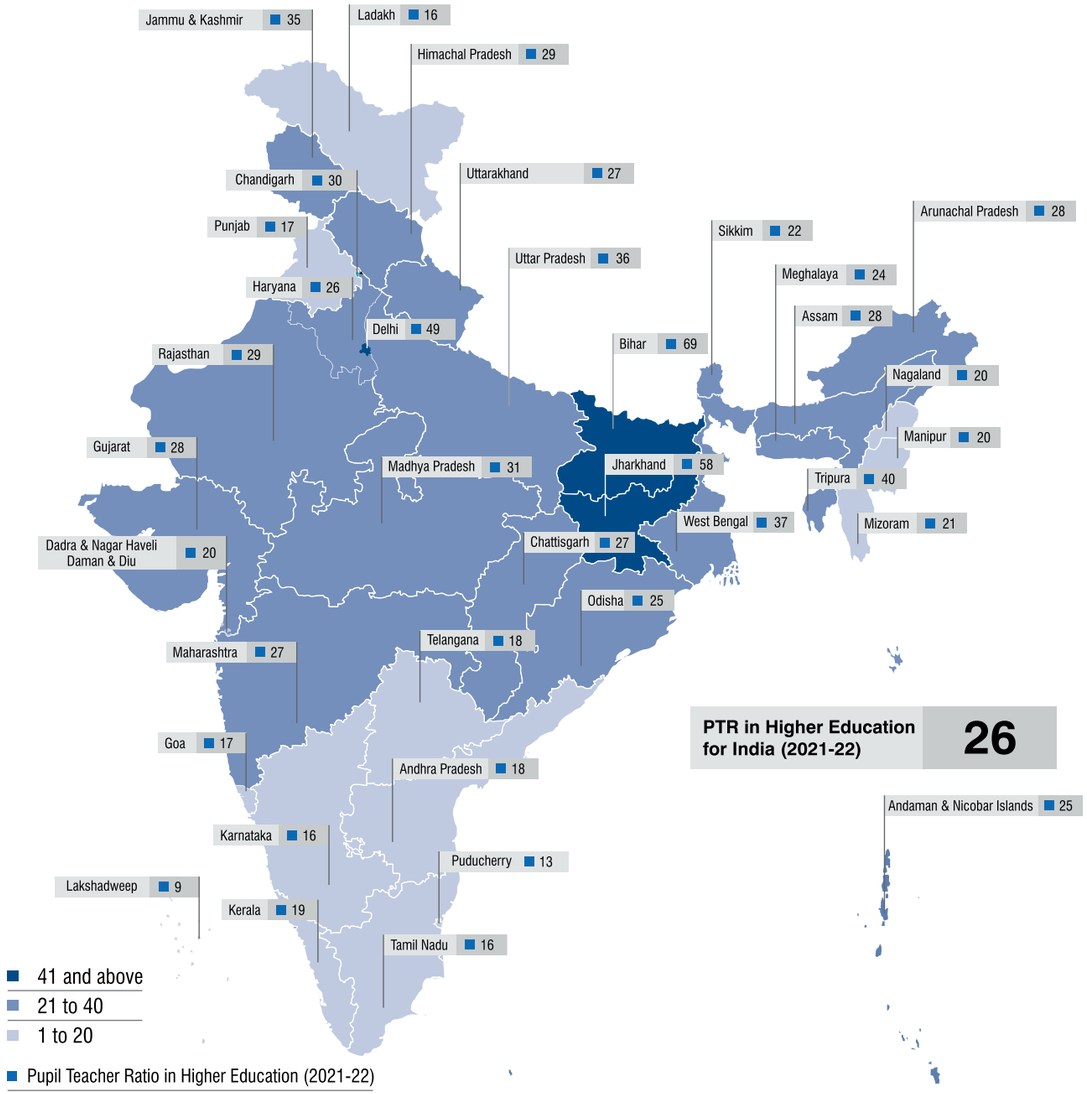
GER showed significant variation, ranging from 1.1 percent in Lakshadweep to 64.8 percent in Chandigarh



- The national average Gross Enrollment Ratio (GER)[3] in higher education increased to 28.4 per cent in 2021-22 from 27.3 per cent in 2020-21
- The GER varied significantly across States/Union Territories, ranging from 1.1 per cent in Lakshadweep to 64.8 per cent in Chandigarh. States/Union Territories with a relatively higher GER included Puducherry (61.5 per cent), Delhi (49 per cent), Tamil Nadu (47 per cent), and Himachal Pradesh (43.1 per cent)
- States/Union Territories with relatively lower GERs included Dadra & Nagar Haveli and Daman & Diu (11.2 per cent), Ladakh (11.5 per cent), Assam (16.9 per cent), and Bihar (17.1 per cent)

[3] GER captures the percentage of people between the ages 18-23 enrolled in universities, colleges, or other higher education institutes.

Bihar, Jharkhand, and Delhi ranked poorly with very high PTR

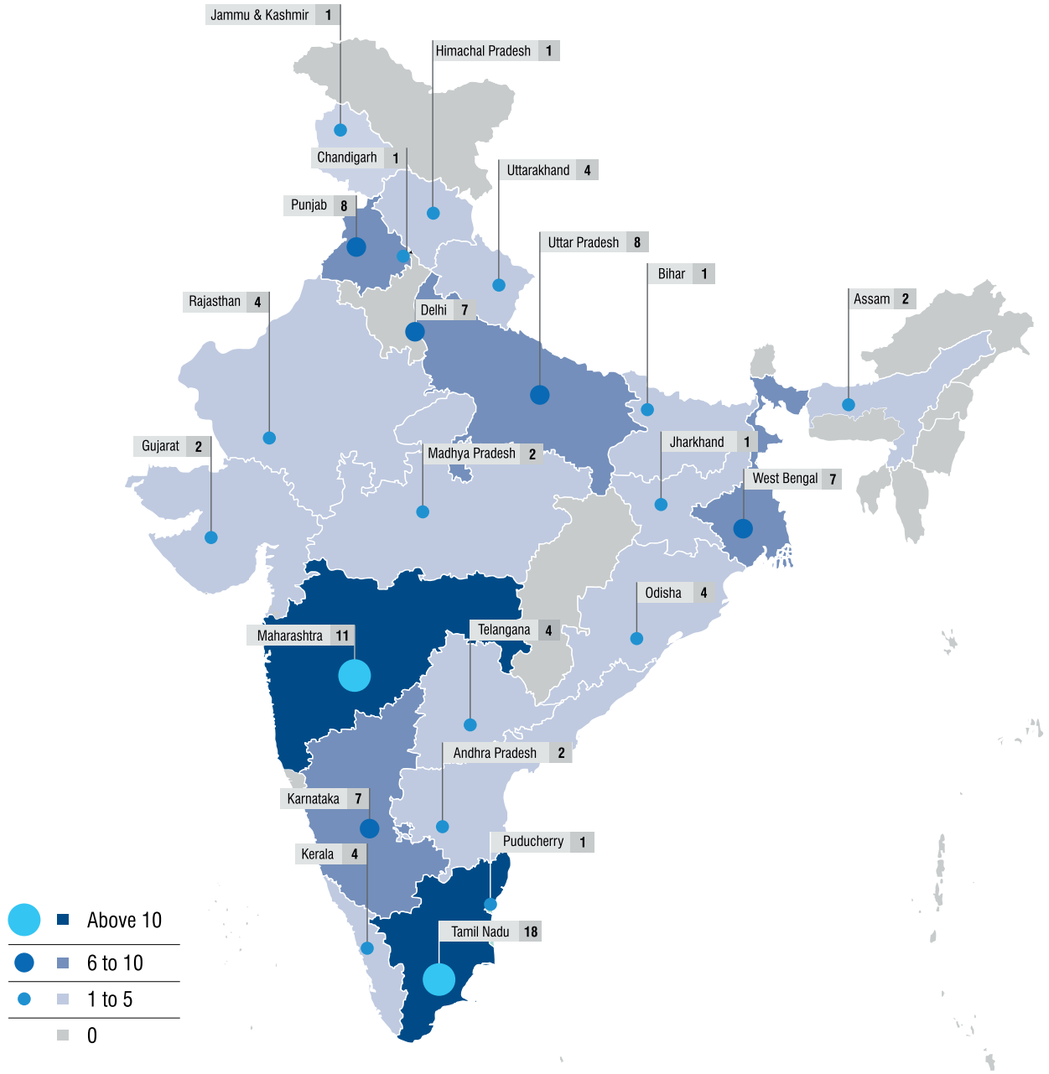


- AISHE's 2021-2022 report[4] shows that the Pupil Teacher Ratio (PTR)[5] at the all-India level was 26 for the year 2021-22, and ranged from 9 in Lakshadweep to 69 in Bihar
- States and Union Territories with very low PTR were Lakshadweep, Puducherry, Karnataka, Ladakh, Tamil Nadu, Goa, and Punjab while states with a very high PTR were Bihar, Jharkhand, and Delhi

[4] All India Survey on Higher Education (AISHE) Report 2021-2022 captures the data for the union territories Dadra and Nagar Haveli and Daman and Diu together.

[5] The Pupil-Teacher Ratio (PTR) in Higher Education has considered the Pupil-Teacher Ratio for both 'regular & the distant mode of education' and enrolment in all types of institutions (University, Colleges, and Stand-alone Institution)

Tamil Nadu leads with 18 educational institutes in the top 100 National Institute Ranking Framework (2023)

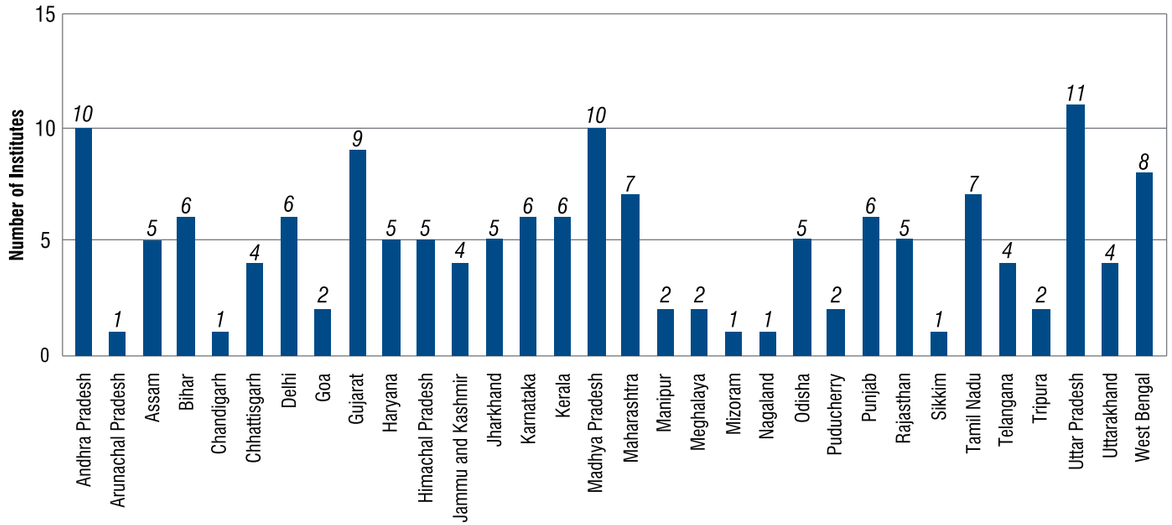


This graphic considers the top 100 ranked universities and institutes in India according to the National Institute Ranking Framework (NIRF)[6], and their distribution across states.

- Tamil Nadu has the highest number of educational institutes ranked in the top 100 with 18 institutes followed by Maharashtra with 11 institutes, and Punjab and Uttar Pradesh with 8 institutes each respectively
- A total of 22 states had at least one institute ranked in the top 100

[6] NIRF outlines a methodology to rank institutions across the country on the basis of parameters which broadly cover “Teaching, Learning and Resources,” “Research and Professional Practices,” “Graduation Outcomes,” “Outreach and Inclusivity,” and “Perception”.

Uttar Pradesh accounts for the highest number of Institutes of National Importance (INIs)



According to the AISHE Report 2021-22, there were 153 Institutes of national importance (INI)[7] in the country as published by the Ministry of Human Resource Development (MHRD).

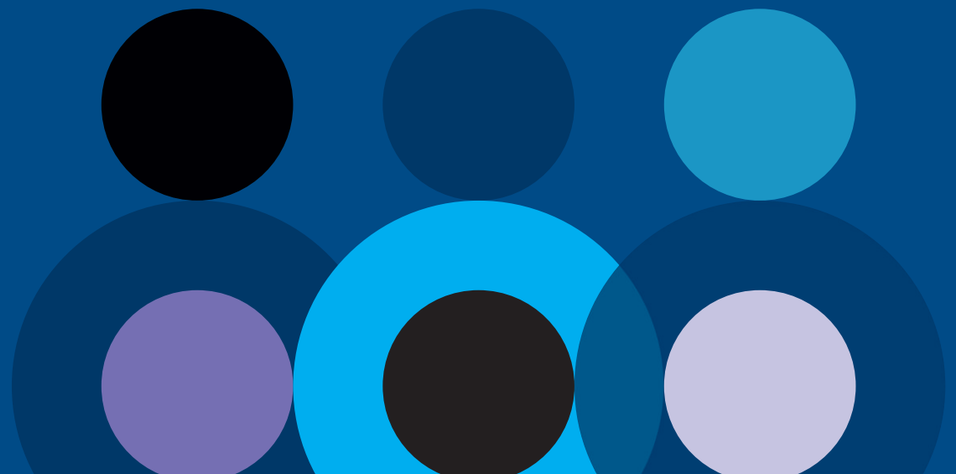
- Uttar Pradesh had 11 INIs, the highest among all states.
- In 2021-22, 4 institutes were granted the status of INI, one each from Delhi, Jammu & Kashmir, Himachal Pradesh, and Madhya Pradesh.

[7] The institutes of national importance have been established by an Act of Parliament. These include the various Indian Institutes of Technology (IIT), National Institutes of Technology (NIT), Indian Institutes of Information Technology (IIIT), Indian Institutes of Science Education & Research (IISER), All India Institutes of Medical Sciences (AIIMS), and the Schools of Planning and Architecture, among others.

Top five states accounted for around 64 per cent of the total patent applications in 2022-23

No.	State/UT	Number of Patent Applications Filed				
		2018-19	2019-20	2020-21	2021-22	2022-23
1	Tamil Nadu	2391	3546	3945	5262	7686
2	Maharashtra	4247	4741	4214	4566	5626
3	Uttar Pradesh	972	1176	2317	3622	5564
4	Karnataka	2185	2230	2784	3222	5408
5	Punjab	661	1435	1650	2197	3405
6	Telangana	1045	1239	1662	1750	2438
7	Delhi	1322	1440	1608	1673	1960
8	Uttarakhand	155	209	356	533	1637
9	Andhra Pradesh	323	484	709	934	1445
10	Rajasthan	305	273	449	465	1278
11	Gujarat	868	885	921	1067	1215
12	Haryana	520	672	765	998	959
13	West Bengal	529	612	505	453	808
14	Madhya Pradesh	195	285	398	488	646
15	Odisha	164	301	377	328	567
Total for Top 15		15882	19528	22660	27558	40642
Total for All States		17005	20844	24326	29508	43301

- The 15 states in this table accounted for close to 94 per cent of the total number of patent applications filed with the Indian Patent Office in 2022-23
- The top five states Tamil Nadu, Maharashtra, Uttar Pradesh, Karnataka, and Punjab accounted for around 64 per cent of the total patent applications in 2022-23
- A majority of the states have seen an increase in patent applications in recent years, with Uttarakhand and Rajasthan seeing a sharp increase in 2022-23 compared to the previous year
- Among the top 15 states, Haryana is the only state to report a decline in the number of patents filed in 2022-23 relative to the previous year



About CTIER

The Centre for Technology, Innovation and Economic Research (CTIER) was established in December 2015 to raise the level of debate and awareness amongst policy makers, industry and researchers in India about the essential role of technical capability in economic development, and how it is best fostered. We aim to inform policy making on the back of high quality empirical economic research, as well as impact higher education in India.

CTIER's work is contributing to systemic change in India’s R&D and innovation ecosystem. We are a trusted source of data for all those shaping India's innovation and technological trajectory.

We have built strong linkages with industry and the academic community. Our unique analysis and insights are informing policies introduced to strengthen India's R&D and innovation ecosystem.

Our programmatic interventions are helping build capabilities needed to transform Indian industry into an innovation powerhouse. CTIER has also been at the forefront of shaping academic thought in economics of innovation.

Access the CTIER Handbook 2025 here:
https://ctier.org/ctier-handbook/

Scan the QR code for CTIER Handbook 2025