



**DEPARTMENT OF SCIENCE & TECHNOLOGY**  
MINISTRY OF SCIENCE & TECHNOLOGY  
GOVERNMENT OF INDIA  
NEW DELHI-110016 (INDIA)

**S&T INDICATORS TABLES**  
RESEARCH AND DEVELOPMENT STATISTICS  
2022-23

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# Table 1

## NATIONAL EXPENDITURE ON RESEARCH AND DEVELOPMENT BY SECTOR

	1970-71	1975-76	1980-81	1985-86	1990-91	1995-96	2001-02	2005-06	2010-11	2011-12	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Central Sector	112.47	287.63	580.49	1654.06	3058.27	5199.79	11536.33	17872.02	33095.18	34021.44	43094.90	46887.17	50219.42	56920.02	65423.90	69317.09	61281.48
State Sector	12.58	26.73	59.34	162.78	365.92	657.02	1494.33	2334.60	4457.81	5137.56	6327.32	6447.94	6866.96	7264.81	8029.21	8554.79	8476.35
Private Sector	14.59	42.35	120.69	251.94	549.98	1627.07	3292.69	8471.95	19337.02	23295.71	32538.39	36022.15	39124.71	41855.88	42489.95	44753.54	46388.13
Higher Education Sector							714.8	1254.01	3306.74	3506.62	5512.83	6095.18	6888.17	7784.33	8797.08	9941.59	11235.00
<b>Total</b>	<b>139.64</b>	<b>356.71</b>	<b>760.52</b>	<b>2068.78</b>	<b>3974.17</b>	<b>7483.88</b>	<b>17038.15</b>	<b>29932.58</b>	<b>60196.75</b>	<b>65961.33</b>	<b>87473.44</b>	<b>95452.44</b>	<b>103099.26</b>	<b>113825.03</b>	<b>124740.14</b>	<b>132567.01</b>	<b>127380.96</b>

**Source :** Data collected and compiled by NSTMIS, DST, GoI.

**Note :** 1. Central Sector data includes 94 R&D units of Public Sector/Joint Sector companies.

2. State Sector includes R&D expenditure of State Agricultural Universities and other State Departments/Organisations.

3. The number of R&D units in the Private Sector varies from year to year as per the DSIR recognition and estimation from other sources.

4. Private Sector industries data for the year 2005-06 onwards comprised of R&D units/firms recognised by DSIR and industries /multinational companies from CMIE database not registered with DSIR.

5. Private Sector data for the period 2018-19 to 2020-21 refers to 2312 in-house Private Sector R&D units which include 446 SIRO units.

6. Higher Education Sector data is based on the DST sponsored study on quantification of resources in higher education in India (derived from AISHE database, MHRD) carried out by BHU (2018-19).

Higher Education data for period 2018-19 to 2020-21 has been estimated by applying five year growth rate based on period from 2010-11 to 2015-16.

7. Central Sector = Central Government Ministries/Department + Public Sector/Joint Sector industries

Table 2

## NATIONAL EXPENDITURE ON RESEARCH AND DEVELOPMENT BY INSTITUTIONAL AND INDUSTRIAL SECTORS

(Rs. Crore)

Sl. No.	Sector	2018-19	2019-20	2020-21
<b>A</b>	<b>INSTITUTIONAL SECTOR</b>			
1	Institutions under Central Government	59830.13	64126.94	55685.93
2	Institutions under State Government	8029.21	8554.79	8476.35
3	Higher Education	8797.08	9941.59	11235.00
	<b>Total (A)</b>	<b>76656.42</b>	<b>82623.32</b>	<b>75397.28</b>
<b>B</b>	<b>INDUSTRY SECTOR</b>			
4	Industry (Public)	5593.77	5190.15	5595.55
5	Industry (Private)	37356.56	39415.95	41007.36
6	Scientific and Industrial Research Organisation (SIRO)	5133.39	5337.59	5380.77
	<b>Total (B)</b>	<b>48083.72</b>	<b>49943.69</b>	<b>51983.68</b>
	<b>GRAND TOTAL (A+B)</b>	<b>124740.14</b>	<b>132567.01</b>	<b>127380.96</b>

**Source :** Data collected and compiled by NSTMIS, DST, Gol.

- Note :**
1. State Sector includes R&D expenditure of State Agricultural Universities and other State Departments / Organisations.
  2. Data for Industrial Sector refer to 2406 in-house R&D units including 1866 Private Sector R&D units, 94 Public Sector R&D units and 446 SIRO units.
  3. Higher Education Sector data is based on the DST sponsored study on quantification of resources in higher education in India (derived from AISHE database, MHRD) carried out by BHU (2018-19). Higher Education data for period 2018-19 to 2020-21 has been estimated by applying five year growth rate based on period from 2010-11 to 2015-16.

**Table 3**  
**NATIONAL EXPENDITURE ON RESEARCH AND DEVELOPMENT**

Year	R&D Expenditure current prices (Rs. Crore)	GDP current prices (Rs. Crore)	R&D % of GDP
<b>Series: 2004-05</b>			
1995-96	7483.88	1226725	0.61
1996-97	8913.61	1419277	0.63
1997-98	10611.34	1572394	0.67
1998-99	12473.17	1803378	0.69
1999-00	14397.60	2023130	0.71
2000-01	16198.80	2177413	0.74
2001-02	17038.15	2355845	0.72
2002-03	18088.16	2536327	0.71
2003-04	20086.34	2841503	0.71
2004-05	24117.24	3242209	0.74
2005-06	29932.58	3693369	0.81
2006-07	34238.39	4294706	0.80
2007-08	39437.77	4987090	0.79
2008-09	47353.38	5630063	0.84
2009-10	53041.30	6477827	0.82
2010-11	60196.75	7784115	0.77
<b>Series: 2011-12</b>			
2011-12	65961.33	8736329	0.76
2012-13	73982.79	9944013	0.74
2013-14	79355.89	11233522	0.71
2014-15	87473.44	12467960	0.70
2015-16	95452.44	13771874	0.69
2016-17	103099.26	15391669	0.67
2017-18	113825.03	17090042	0.67
2018-19	124740.14	18899668	0.66
2019-20	132567.01	20074856	0.66
2020-21	127380.96	19800914	0.64

**Source :** (i) Data on R&D expenditure collected and compiled by NSTMIS, DST, Gol.  
(ii) Data on GDP from 2011-12 onwards - Economic Survey 2022-23.  
(iii) Data on GDP from 1985-86 to 2010-11- Economic Survey 2018-19.

**Note :** 1. GDP : Gross Domestic Product.  
2. R&D : Research & Development.  
3. R&D/GDP ratio have been revised as per the new GDP figures.

Table 4

### NATIONAL EXPENDITURE ON RESEARCH & DEVELOPMENT AT CURRENT AND CONSTANT PRICES

Rs. Crore)

Year	National Expenditure on Research and Development	
	Current Prices	Constant Prices
<b>Base Year: 2004-05</b>		
1985-86	2068.78	7960.98
1990-91	3974.17	10085.15
1995-96	7483.88	11627.32
1996-97	8913.61	12873.45
1997-98	10611.34	14393.25
1998-99	12473.17	15663.93
1999-00	14397.60	17542.37
2000-01	16198.80	19042.89
2001-02	17038.15	19405.60
2002-03	18088.16	21563.84
2003-04	20086.34	21236.36
2004-05	24117.24	24117.24
2005-06	29932.58	28715.90
2006-07	34238.39	30864.41
2007-08	39437.77	33616.38
2008-09	47353.38	37145.07
2009-10	53041.30	39228.08
2010-11	60196.75	40850.18
<b>Base Year: 2011-12</b>		
2011-12	65961.33	65961.33
2012-13	73982.79	68544.23
2013-14	79355.89	69238.88
2014-15	87473.44	73860.68
2015-16	95452.44	78801.61
2016-17	103099.26	82444.97
2017-18	113825.03	87547.03
2018-19	124740.14	92354.96
2019-20	132567.01	95858.08
2020-21	127380.96	87222.81

**Source :** 1. Data collected and compiled by NSTMIS, DST, Gol.  
 2. Data on GDP from 2011-12 onwards - Economic Survey 2022-23.  
 3. Data on GDP from 1985-86 to 2010-11- Economic Survey 2018-19.



**Table 5**  
**PUBLIC AND PRIVATE INVESTMENT IN NATIONAL**  
**R&D AND % SHARE IN GDP**

(Rs. Crore)

Year	Public Investment in R&D	% share of Public Investment in total R&D	Private Investment in R&D	% share of Private Investment in total R&D	Total Investment in R&D
2004-05	18078.28(0.5)	75.0	6038.96(0.2)	25.0	24117.24(0.7)
2005-06	21460.63(0.6)	71.7	8471.95(0.2)	28.3	29932.58(0.8)
2006-07	23752.81(0.6)	69.4	10485.58(0.2)	30.6	34238.39(0.8)
2007-08	26511.64(0.5)	67.2	12926.14(0.3)	32.8	39437.77(0.8)
2008-09	32987.98(0.5)	69.7	14365.40(0.3)	30.3	47353.38(0.8)
2009-10	37735.75(0.6)	71.1	15305.55(0.2)	28.9	53041.30(0.8)
2010-11	40859.73(0.6)	67.9	19337.02(0.2)	32.1	60196.75(0.8)
2011-12	42665.62(0.5)	64.7	23295.71(0.3)	35.3	65961.33(0.8)
2012-13	46886.28(0.5)	63.4	27096.51(0.3)	36.6	73982.79(0.7)
2013-14	48841.09(0.4)	61.5	30514.80(0.3)	38.5	79355.89(0.7)
2014-15	54935.05(0.4)	62.8	32538.39(0.3)	37.2	87473.44(0.7)
2015-16	59430.29(0.4)	62.3	36022.15(0.3)	37.7	95452.44(0.7)
2016-17	63974.55(0.4)	62.1	39124.71(0.3)	37.9	103099.26(0.7)
2017-18	71969.15(0.5)	63.2	41855.88(0.2)	36.8	113825.03(0.7)
2018-19	82250.19(0.4)	65.9	42489.95(0.2)	34.1	124740.14(0.7)
2019-20	87813.47(0.4)	66.2	44753.54(0.2)	33.8	132567.01(0.7)
2020-21	80992.83(0.4)	63.6	46388.13(0.2)	36.4	127380.96(0.6)

**Source :** Data collected and compiled by NSTMIS, DST, Gol.

- Note :**
1. Public Investments in R&D = Central Government Ministries/Department + Public Sector/joint sector industries + State Government + Higher Education
  2. Private Investment in R&D = Private Industries + SIROs
  3. Number in parenthesis indicate percentage share in GDP.

Table 6

## GOVERNMENT AND BUSINESS ENTERPRISE INVESTMENT IN NATIONAL R&D AND % SHARE IN GDP

(Rs. Crore)

Year	Investment in R&D by Government	%	Investment in R&D by Business Enterprises	%	Total GERD
2004-05	16820.40(0.5)	69.7	7296.84(0.2)	30.3	24117.24(0.7)
2005-06	20173.43(0.5)	67.4	9759.15(0.3)	32.6	29932.58(0.8)
2006-07	22287.40(0.5)	65.1	11950.99(0.3)	34.9	34238.39(0.8)
2007-08	24634.39(0.5)	62.5	14803.39(0.3)	37.5	39437.78(0.8)
2008-09	30530.96(0.5)	64.5	16822.42(0.3)	35.5	47353.38(0.8)
2009-10	34921.19(0.5)	65.8	18120.11(0.3)	34.2	53041.30(0.8)
2010-11	37547.92(0.5)	62.4	22648.83(0.3)	37.6	60196.75(0.8)
2011-12	38903.05(0.4)	59.0	27058.28(0.3)	41.0	65961.33(0.8)
2012-13	40568.09(0.4)	54.8	33414.70(0.3)	45.2	73982.79(0.7)
2013-14	44419.34(0.4)	56.0	34936.55(0.3)	44.0	79355.89(0.7)
2014-15	50285.41(0.4)	57.5	37188.03(0.3)	42.5	87473.44(0.7)
2015-16	54976.45(0.4)	57.6	40475.99(0.3)	42.4	95452.44(0.7)
2016-17	59268.33(0.4)	57.5	43830.93(0.3)	42.5	103099.26(0.7)
2017-18	66715.95(0.4)	58.6	47109.08(0.3)	41.4	113825.03(0.7)
2018-19	76656.42(0.4)	61.5	48083.72(0.3)	38.5	124740.14(0.7)
2019-20	82623.32(0.4)	62.3	49943.69(0.2)	37.7	132567.01(0.7)
2020-21	75397.28(0.4)	59.2	51983.68(0.3)	40.8	127380.96(0.6)

**Source :** Data collected and compiled by NSTMIS, DST, GoI.

- Note :**
1. Government Investment in R&D = Central Government Ministries/Department + State Government + Higher Education
  2. Business Enterprise/ Industry Investment in R&D = Public sector industry + Private sector industry + SIROs
  3. Number in parenthesis indicate percentage share in GDP.

**Table 7**  
**EXPENDITURE ON RESEARCH & DEVELOPMENT BY SELECT MAJOR SCIENTIFIC AGENCIES**

(Rs. Crore)

Sl No.	Agency\ Year	1970-71	1980-81	1990-91	2000-01	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	Council of Scientific & Industrial Research (CSIR)	21.56	69.00	249.19	864.12	3988.14	4013.06	4582.12	4548.78	4871.63	4198.82
2	Defence Research & Development Organisation (DRDO)	17.55	79.70	681.00	3359.32	13317.12	13382.05	15195.87	17049.02	17425.60	15807.08
3	Department of Atomic Energy (DAE)	28.72	73.48	275.54	1005.52	4635.95	4750.39	5208.01	6323.78	7151.63	5839.02
4	Department of Biotechnology (DBT)	-	-	41.37	120.58	1210.25	1446.71	1771.65	2379.10	2358.77	2259.10
5	Ministry of Electronics and Information Technology (MEITY) +	-	5.41	33.03	51.07	351.51	409.85	386.55	951.35	1157.86	1155.95
6	Ministry of New and Renewable Energy (MNRE)	-	4.00	16.02	12.27	23.11	32.35	34.50	55.82	48.97	59.80
7	Ministry of Earth Sciences (MES) ++	-	-	27.80	84.23	839.25	951.24	1123.58	1004.59	1163.31	793.23
8	Department of Science & Technology (DST)	0.84	40.64	119.82	311.46	2800.76	3161.54	3526.64	3768.33	4053.38	3514.23
9	Department of Space (DOS)	-	56.02	386.22	1905.40	6920.01	8040.00	9130.57	11135.41	12966.54	9452.72
10	Indian Council of Agricultural Research (ICAR)	18.37	97.45	276.25	1161.74	4369.75	4592.95	5355.57	6223.8	6152.02	6358.66
11	Indian Council of Medical Research (ICMR)	2.18	9.00	44.54	149.12	918.02	1073.83	1468.70	1436.62	1521.17	1580.78
12	Ministry of Environment, Forest and Climate Change (MoEFCC)	-	3.74	162.09	272.86	192.84	220.21	260.87	440.48	456.53	422.66
	<b>Total</b>	<b>89.22</b>	<b>438.44</b>	<b>2312.87</b>	<b>9297.69</b>	<b>39566.71</b>	<b>42074.18</b>	<b>48044.63</b>	<b>55317.08</b>	<b>59327.41</b>	<b>51442.05</b>

**Source :** Data collected and compiled by NSTMIS, DST, GoI.

**Note :** 1. Not including Public Sector Research and Development Expenditure.

2. Department does not exist during this period.

3. + Formerly Ministry of Communications & Information Technology

4. ++ Formerly Department of Ocean Development

5. Data includes both Plan & Non-Plan R&D Expenditure.

**Table 8**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT BY CENTRAL**  
**MINISTRIES/DEPARTMENTS OTHER THAN MAJOR SCIENTIFIC AGENCIES**

(Rs. Crore)

S.No.	Ministry/Departments	Research and Development Expenditure		
		2018-19	2019-20	2020-21
1	Agriculture, Cooperation and Farmers' Welfare	12.48	14.07	12.60
2	Animal Husbandry and Dairying	28.76	33.18	28.96
3	AYUSH	542.72	667.93	638.41
5	Chemicals and Petrochemicals	5.53	2.96	3.08
6	Coal	68.78	89.75	58.34
7	Commerce	94.47	172.96	89.83
8	Consumer Affairs	13.65	11.73	12.86
9	Culture	45.86	39.17	50.10
10	Defence Production	2869.24	2569.51	2946.12
11	Empowerment of Persons with Disabilities	0.54	0.53	0.42
12	Fertilizers	5.07	15.51	12.24
13	Finance	0.85	2.13	0.67
14	Food and Public Distribution	11.55	12.02	11.45
15	Food Processing Industries	22.28	56.01	23.99
16	Health and Family Welfare	209.23	234.80	224.02
17	Heavy Industry	923.71	874.38	819.92
18	Home Affairs	7.20	7.78	5.96
19	Housing and Urban Affairs	2.47	1.43	0.94
20	Human Resource Development	735.07	800.90	620.98
21	Information and Broadcasting	11.89	11.94	11.66
22	Industrial Policy and Promotion	40.24	41.79	54.50
23	Labour and Employment	10.43	11.29	0

Table 8 Contd...

**Table 8 (Contd.)**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT BY CENTRAL**  
**MINISTRIES/DEPARTMENTS OTHER THAN MAJOR SCIENTIFIC AGENCIES**

(Rs. Crore)

S.No.	Ministry/Departments	Research and Development Expenditure		
		2018-19	2019-20	2020-21
24	Micro, Small and Medium Enterprises	32.23	34.83	19.20
25	Mines	856.36	916.24	897.23
26	Petroleum and Natural Gas	1484.75	1395.96	1534.01
27	Pharmaceuticals	64.98	69.05	86.19
28	Power	474.72	442.40	361.37
29	Railways	189.34	205.46	229.74
30	Road Transport and Highways	6.98	8.72	6.66
31	Shipping	0.40	0.23	0.53
32	Social Justice and Empowerment	0.02	0	0.01
33	Statistics and Programme Implementation	187.51	170.42	166.84
34	Steel	150.79	150.83	157.25
35	Telecommunications	455.39	373.02	302.55
36	Textiles	325.66	326.05	250.01
37	Water Resources, River Development and Ganga Rejuvenation	113.75	114.53	101.13
38	Public Sector under Major Scientific Agencies	70.84	76.93	73.11
39	Joint Sector under State Undertaking	31.06	33.18	26.48
	<b>Total</b>	<b>10106.8</b>	<b>9989.62</b>	<b>9839.36</b>

**Source :** Data collected and compiled by NSTMIS, DST, GoI.

**Note :** 1. Data includes both Plan & Non-Plan R&D expenditure.  
2. Departments/Ministries with no R&D expenditure are not shown in this Table.

**Table 9**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT**  
**BY STATE GOVERNMENTS**

(Rs. Crore)

S.No.	State	Research and Development Expenditure		
		2018-19	2019-20	2020-21
1	Andhra Pradesh	502.40	469.29	501.59
2	Assam	299.37	390.59	355.45
3	Bihar	433.14	633.15	379.32
4	Chhattisgarh	177.24	200.73	227.02
5	Delhi	64.94	57.61	69.75
6	Gujarat	876.32	934.55	922.63
7	Haryana	136.81	153.43	133.61
8	Himachal Pradesh	130.29	133.34	116.45
9	Jammu & Kashmir	317.09	389.11	394.19
10	Jharkhand	117.05	84.48	89.76
11	Karnataka	447.41	479.78	394.42
12	Kerala	459.10	511.52	492.26
13	Madhya Pradesh	278.77	270.61	262.57
14	Maharashtra	603.70	595.86	663.42
15	Manipur	29.90	10.91	13.58
16	Meghalaya	7.53	7.10	7.47
17	Odisha	192.89	233.47	269.24
18	Punjab	625.71	635.58	697.02
19	Rajasthan	234.87	238.63	242.81
20	Tamil Nadu	513.86	637.75	609.72
21	Telangana	361.37	396.94	385.03
22	Uttar Pradesh	973.99	830.27	1002.34
23	Uttarakhand	189.39	200.09	185.66
24	West Bengal	56.04	59.98	61.05
	<b>Total</b>	<b>8029.21</b>	<b>8554.79</b>	<b>8476.35</b>

**Source** : Data collected and compiled by NSTMIS, DST, Gol.

**Note** : 1. Research & Development Expenditure figures are based on survey response.  
2. States/Union Territories with no R&D Expenditure or R&D Units are not shown in this Table.

**Table 10**  
**EXPENDITURE ON RESEARCH & DEVELOPMENT**  
**BY COOPERATIVE RESEARCH ASSOCIATIONS**

(Rs. Crore)

S.No.	Name	2018-19	2019-20	2020-21
1	Ahmedabad Textile Industry's Research Association (ATRA)	8.36	5.92	5.37
2	Dudhsagar Research and Development Association	11.35	11.28	10.44
3	Electrical Research & Development Association	97.87	71.23	80.63
4	Indian Jute Industries' Research Association	7.20	7.18	6.69
5	Indian Rubber Manufacturers Research Association	13.33	13.44	13.44
6	Man Made Textiles Research Association	4.07	3.87	2.63
7	Northern India Textile Research Association	17.21	10.45	9.51
8	Petroleum Conservation Research Association (PCRA)*	0.90	0.08	0.72
9	Tea Research Association **	34.76	36.99	29.5
10	The Automotive Research Association of India	221.31	202.09	218.27
11	The Bombay Textile Research Association (BTRA)	8.90	7.79	6.48
12	The Sima Cotton Development & Research Association	0.03	0.06	0.04
13	The South India Textile Research Association	9.93	10.71	10.81
14	The Synthetic & Art Silk Mills' Research Association	17.58	13.73	9.46
15	Wool Research Association	2.81	2.87	2.81
	<b>Total</b>	<b>455.61</b>	<b>397.69</b>	<b>406.8</b>

**Source :** Data collected and compiled by NSTMIS, DST, GoI.

**Note :** 1. \* Extramural research supported by PCRA.

2. \*\* Includes data for all Tea Research Institutes

**Table 11**  
**SCIENCE & TECHNOLOGY EXPENDITURE BY TYPE OF WORK**  
**BY CENTRAL AND STATE GOVERNMENTS & SIROS**

(Rs. Crore)

Year	Central Government				State Government				Scientific and Industrial Research Organisation				Total							
	Basic Research	Applied Research	Experimental Development	Other Related S&T Activities	Total S&T	Basic Research	Applied Research	Experimental Development	Other Related S&T Activities	Total S&T	Basic Research	Applied Research	Experimental Development	Other Related S&T Activities	Total S&T					
2018-19	14643.91	19606.14	25580.07	2235.63	62065.75	1708.43	3504.27	2816.51	1523.58	9552.79	1600.07	2298.14	1234.67	1140.33	6273.21	17952.41	25408.55	29631.25	4899.54	77891.75
2019-20	15514.81	21122.03	27490.10	2469.83	66596.77	1786.19	3708.24	3060.36	1640.9	10195.69	1670.62	2387.16	1279.22	1283.96	6620.96	1897.162	27217.43	31829.68	5394.69	83413.42
2020-21	13935.44	18211.21	23539.28	2261.83	57947.76	1810.66	3757.40	2908.29	1593.72	10070.07	1560.24	2494.46	1325.45	1218.43	6598.58	17306.34	24463.07	27773.02	5073.98	74616.41

**Source :** Data collected and compiled by NSTIMIS, DST, GoI.

**Note :** 1. R&D : Research and Development = Basic Research + Applied Research + Experimental Development.  
 2. S&T : Science and Technology = R&D + Other related S&T activities.



**Table 12**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT BY OBJECTIVES**

(Rs. Crore)

S.No.	Objective	Central Government			State Government			SIRO			Private Sector			Public Sector			Total		
		2018-19	2019-20	2020-21	2018-19	2019-20	2020-21	2018-19	2019-20	2020-21	2018-19	2019-20	2020-21	2018-19	2019-20	2020-21	2018-19	2020-21	
1	Defence	17049.02	17425.60	15807.08	-	-	-	9.26	9.65	5.74	370.83	270.32	418.31	2869.21	2575.71	2944.89	20298.32	20281.28	19176.02
2	Development of Agriculture, Forestry and Fishing	6761.01	6764.50	6823.40	6854.29	7322.11	7356.30	154.03	138.87	124.53	1424.19	1542.55	1688.16	3.99	13.33	12.26	15197.51	15781.36	16004.65
3	Education	1547.61	1738.88	1483.65	1047.64	1099.10	1072.91	1282.17	1264.11	1649.12	74.84	75.01	83.82	-	-	-	3952.26	4177.10	4289.50
4	Energy	4933.20	5396.81	4361.31	-	-	-	104.49	86.18	94.97	892.39	1039.57	920.08	2259.22	2171.90	2222.66	8189.30	8694.46	7599.02
5	Environment	271.41	271.23	240.38	-	-	-	106.48	111.14	100.62	125.23	134.37	121.44	-	-	-	503.12	516.74	462.44
6	Exploration and Exploitation of Space	11223.91	13059.43	9573.40	-	-	-	1.23	1.15	16.64	0.38	0.39	0.40	-	-	-	11225.52	13060.97	9590.44
7	Exploration and Exploitation of the Earth	2116.52	2462.72	2031.54	-	-	-	-	-	-	21.30	17.96	18.64	108.66	117.80	108.11	2246.48	2598.48	2158.29
8	General Advancement of Knowledge	6762.01	7473.78	6476.08	-	-	-	307.34	331.68	248.40	70.54	75.36	58.93	-	-	-	7139.89	7880.82	6783.41
9	Health	4818.91	5001.11	4957.19	9.66	9.55	11.04	2596.50	2718.82	2627.13	14921.01	15504.23	17503.05	5.80	5.30	5.76	22351.88	23239.01	25104.17
10	Industrial Production and Technology	1130.44	1219.62	951.98	-	-	-	162.27	184.10	164.79	12571.08	13092.30	12968.92	345.08	304.62	300.60	14208.87	14800.64	14386.29
11	Other Aims	2125.08	2342.26	2066.40	87.29	87.32	0.36	221.58	230.24	218.28	3726.92	4247.13	4394.35	1.62	1.36	1.22	6162.49	6908.31	6680.61
12	Political & Social Systems, Structures & Processes (including socio-economic services)	26.73	16.87	20.46	25.56	32.09	30.28	3.80	4.18	4.20	8.30	9.65	11.07	-	-	-	64.39	62.79	66.01
13	Transport, Telecommunication and other Infrastructures	1064.26	954.14	893.07	4.77	4.62	5.46	184.24	257.47	126.35	3149.54	3407.12	2820.20	0.19	0.13	0.05	4403.00	4623.48	3845.13
	<b>Total</b>	<b>59830.11</b>	<b>64126.95</b>	<b>55685.94</b>	<b>8029.21</b>	<b>8554.79</b>	<b>8476.35</b>	<b>5133.39</b>	<b>5337.59</b>	<b>5380.77</b>	<b>37356.55</b>	<b>39415.96</b>	<b>41007.37</b>	<b>5593.77</b>	<b>5190.15</b>	<b>5595.55</b>	<b>115943.03</b>	<b>122625.44</b>	<b>116145.98</b>

**Source :** Data collected and compiled by NSTMIS, DST, GoI.

**Note :** 1. Higher Education sector is not included.

2. Private Sector includes Scientific & Industrial Research Organisations (SIRO)

3. Objectives Standardised as per UNESCO Classification.

4.- represents nil

**Table 13**  
**RESEARCH AND DEVELOPMENT EXPENDITURE, ADVERTISING EXPENDITURE, NEW PLANT AND MACHINERY EXPENDITURE VERSUS SALES TURNOVER IN PUBLIC AND PRIVATE SECTOR INDUSTRY**

Year	Research and Development Expenditure		Advertising Expenditure		New Plant Machinery Expenditure		Sales Turnover		Research and Development Expenditure as % of Sales Turnover		Advertising Expenditure as % of Sales Turnover		New Plant Machinery Expenditure as % of Sales Turnover	
	(Rs. Crore)		(Rs. Crore)		(Rs. Crore)		(Rs. Crore)		(%)		(%)		(%)	
	Public Sector	Private Sector	Public Sector	Private Sector	Public Sector	Private Sector	Public Sector	Private Sector	Public Sector	Private Sector	Public Sector	Private Sector	Public Sector	Private Sector
2018-19	5593.77	37356.56	756.88	21807.58	78761.08	66136.83	2153206.23	2706823.93	0.26	1.38	0.04	0.81	3.66	2.44
2019-20	5190.15	39415.95	643.08	21987.38	73806.91	156926.02	2042439.71	2588369.96	0.25	1.52	0.03	0.85	3.61	6.06
2020-21	5595.55	41007.36	478.10	21707.74	72795.52	60304.89	1861457.37	2799660.27	0.30	1.46	0.03	0.78	3.91	2.15

**Source :** Data collected and compiled by NSTMIS, DST, GoI.

**Note :** 1. Data for Public Sector refers to 94 industrial R&D units.

2. Data for Private Sector refers to 1866 industrial units and 446 SIROs.

**Table 14**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT BY PUBLIC/JOINT**  
**SECTOR UNDERTAKINGS 2020-21**

Ministry/Department/State	Public/Joint Sector Undertaking	R&D Expenditure (Rs. Crore)	R&D Expenditure as % of S.T.O.	
Atomic Energy	Electronics Corporation of India Ltd.	42.78	2.84	
	IREL (India) Ltd.	4.11	0.38	
	Nuclear Power Corporation of India Ltd.	12.34	0.02	
	Uranium Corporation of India Ltd.	9.77	0.42	
Biotechnology	Bharat Immunologicals & Biologicals Corporation Ltd.	1.01	1.18	
Chemicals and Petrochemicals	HIL (India) Ltd. (Formerly, Hindustan Insecticides Ltd.)	0.02	0	
Coal	Central Mine Planning & Design Institute Ltd.	22.20	1.27	
	Coal India Ltd.	12.28	0.01	
	NLC India Ltd.	21.70	0.30	
	The Singareni Collieries Company Ltd.	2.16	0.01	
Defence Production	BEML Ltd. (Formerly Bharat Earth Movers Ltd.)	132.66	3.73	
	Bharat Dynamics Ltd.	42.95	2.24	
	Bharat Electronics Ltd.	959.34	6.94	
	Garden Reach Shipbuilders & Engineers Ltd.	13.28	1.16	
	Goa Shipyard Ltd.	9.96	1.16	
	Hindustan Aeronautics Ltd. (Consolidated)	1687.40	7.54	
	Hindustan Shipyard Ltd.	5.40	1.13	
	Mazagon Dock Shipbuilders Ltd.	82.41	2.04	
Empowerment of Persons with Disabilities	Mishra Dhatu Nigam Ltd.	12.72	1.56	
	Artificial Limbs Manufacturing Corporation of India	0.34	0.12	
	Fertilizers	Indian Farmers Fertiliser Cooperative Ltd., Kalol	8.66	0.60
		National Fertilizers Ltd.	0.45	0
Rashtriya Chemicals & Fertilizers Ltd.		2.53	0.03	
The Fertilizers and Chemicals Travancore Ltd		0.59	0.02	
Finance	Security Printing and Minting Corporation Of India Ltd.	0.67	0.01	
Food and Public Distribution	Central Warehousing Corporation	0.09	0	
Health and Family Welfare	HLL Lifecare Ltd. (HLL) (Formerly Hindustan Latex Ltd.)	3.72	0.07	

**Table 14 (Contd.)**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT BY PUBLIC/JOINT**  
**SECTOR UNDERTAKINGS 2020-21**

Ministry/Department/State	Public/Joint Sector Undertaking	R&D Expenditure (Rs. Crore)	R&D Expenditure as % of S.T.O.
Heavy Industry	Andrew Yule & Co. Ltd.	0.11	0.03
	Bharat Heavy Electricals Ltd.	545.81	3.35
	NEPA Ltd.	0.62	3.57
	Rajasthan Electronics & Instruments Ltd.	3.11	2.03
	Sambhar Salts Ltd.	0.11	0.44
Housing and Urban Affairs	Housing and Urban Development Corporation Ltd.	0.15	0
	NBCC India Ltd.	0.80	0.02
Mines	Chennai Petroleum Corporation Ltd. (Madras Refineries Ltd.)	6.26	0.01
	Hindustan Copper Ltd.	0.80	0.05
	National Aluminium Company Ltd.	12.62	0.14
Petroleum and Natural Gas	Balmer Lawrie & Company Ltd.	6.91	0.43
	Bharat Petroleum Corporation Ltd.	106.01	0.04
	Engineers India Ltd.	28.88	0.93
	Gail (India) Ltd.	20.12	0.04
	Hindustan Petroleum Corporation Ltd.	295.65	0.11
	Indian Oil Corporation Ltd.	500.09	0.10
	Oil & Natural Gas Corporation Ltd.	501.68	0.74
	Oil India Ltd.	73.96	0.86
Pharmaceuticals	Hindustan Antibiotics Ltd.	0.97	1.16
Power	National Thermal Power Corporation Ltd.	185.78	0.19
	NHPC Ltd.	2.08	0.02
	Power Grid Corporation of India Ltd.	9.40	0.02
	THDC India Ltd	3.23	0.18
Scientific and Industrial Research	Central Electronics Ltd.	3.10	1.05
Shipping	Cochin Shipyard Ltd.	0.53	0.02
Steel	MECON Ltd.	0.03	0
	MOIL Ltd. (Formerly Manganese Ore India Ltd.)	6.21	0.53
	NMDC (Formerly National Mineral Development Corporation)	29.20	0.19
	Rashtriya Ispat Nigam Ltd.	19.86	0.11
	Research & Development Centre for Iron & Steel (RDCIS), SAIL	101.91	14.89

Table 14 Contd...

**Table 14 (Contd.)**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT BY PUBLIC/JOINT**  
**SECTOR UNDERTAKINGS 2020-21**

Ministry/Department/State	Public/Joint Sector Undertaking	R&D Expenditure (Rs. Crore)	R&D Expenditure as % of S.T.O.
Telecommunications	ITI Ltd.	11.49	0.75
Textiles	National Textile Corporation (Western Region) Ltd.	0.01	0.02
Gujarat	Gujarat Alkalies & Chemicals	2.40	0.10
	Gujarat Narmada Valley Fertilizers and Chemicals Ltd.	1.55	0.03
	Gujarat State Fertilizers & Chemicals Ltd. Fertilizer Unit	11.49	0.15
Haryana	Haryana Leather Chemicals Ltd.	0.51	15.92
Karnataka	Hutti Gold Mines Co. Ltd.	0.02	0
	Karnataka Soaps & Detergents Ltd.	0.65	0.09
	Karnataka State Seed Corporation Ltd.	0.88	0.41
Kerala	Keltron Component Complex Ltd.	0.23	0.32
	Kerala Agro Machinery Corpn. Ltd.	0.14	7.09
	Kerala Automobiles Ltd.	0.05	1.19
	Kerala Electrical & Allied Engg. Co. Ltd.	0.02	0.02
	Travancore Titanium Products Ltd	2.44	1.25
Maharashtra	Haffkine Bio-Pharmaceutical Corporation Ltd.	0.07	0.06
	Maharashtra State Seeds Corporation Ltd.	1.00	0.22
Tamil Nadu	Tamil Nadu Newsprint & Papers Ltd.	4.72	0.17
West Bengal	West Bengal Electronics Industry Development Corporation Ltd.- WML Division	0.31	3.59
	<b>Total</b>	<b>5595.51</b>	<b>0.30</b>

**Source :** Data collected and compiled by NSTMIS, DST, Gol.

**Note :** 1. R&D : Research and Development.

2. S.T.O. : Sales Turnover.

Table 15

EXPENDITURE ON RESEARCH AND DEVELOPMENT BY INDUSTRY GROUPS  
FOR PUBLIC SECTOR

Sl. No.	Industry Group	No. of R&D Units	R&D Expenditure					
			(Rs. Crore)			as % of S.T.O.		
			2018-19	2019-20	2020-21	2018-19	2019-20	2020-21
1	Agricultural Machinery	4	10.37	7.73	8.23	0.47	0.41	0.45
2	Bio-technology	1	0.58	0.52	1.01	0.69	0.78	1.18
3	Boilers & Steam Generating Plants	1	138.59	183.33	185.78	0.15	0.19	0.19
5	Chemicals (other than fertilizers)	8	7.88	8.86	7.04	0.06	0.07	0.06
6	Consultancy Services	2	64.05	65.91	51.08	1.62	1.36	1.05
7	Defence Industries	14	2798.52	2465.96	2813.45	6.53	5.41	6.19
8	Drugs & Pharmaceuticals	2	1.54	1.39	1.10	1.17	0.67	0.55
9	Earth Moving Machinery	1	70.72	103.54	132.66	2.03	3.42	3.73
10	Electricals & Electronics	10	121.63	73.75	64.26	0.23	0.14	0.12
11	Fertilizers	6	14.34	25.96	23.71	0.04	0.07	0.07
12	Fuels	14	1509.21	1446.17	1568.90	0.08	0.09	0.10
13	Industrial Equipment	2	625.60	608.44	545.81	2.12	2.96	3.34
14	Industrial Machinery	1	0.53	0.75	0.11	0.17	0.25	0.03
15	Medical & Surgical Appliances	1	3.73	3.44	3.73	0.26	0.21	0.07
16	Metallurgical Industries	10	178.70	162.67	168.56	0.35	0.39	0.34
17	Miscellaneous Industries	9	4.16	4.12	2.58	0.01	0.01	0.01
18	Paper & Pulp	2	11.93	12.48	5.34	0.29	0.36	0.19
19	Soaps, Cosmetics, Toilet Preparations	1	0.92	0.61	0.65	0.16	0.09	0.09
20	Sugar	1	0.38	0.00	0.00	0.11	0.00	0.00
21	Telecommunications	1	29.94	14.17	11.49	3.59	1.99	0.75
22	Textiles (Dyed, Printed, Processed)	2	0.25	0.27	0.01	0.02	0.03	0.01
23	Transportation	1	0.19	0.13	0.05	5.46	3.93	1.19
	<b>Total</b>	<b>94</b>	<b>5593.76</b>	<b>5190.20</b>	<b>5595.55</b>	<b>0.26</b>	<b>0.25</b>	<b>0.30</b>

**Source :** Data collected and compiled by NSTMIS, DST, Gol.

**Note :** 1. S.T.O : Sales Turnover.

2. R&D : Research and Development.

**Table 16**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT**  
**BY INDUSTRY GROUPS FOR PRIVATE SECTOR**

S.No.	Industry Group	No.of R&D Units	R&D Expenditure					
			(Rs. Crore)			as % of S.T.O.		
			2018-19	2019-20	2020-21	2018-19	2019-20	2020-21
1	Agricultural Machinery	160	1543.25	1292.79	1131.90	1.78	1.62	1.19
2	Bio-technology	144	1243.36	1637.92	1879.19	6.94	8.62	4.98
3	Boilers & Steam Generating Plants	3	63.92	131.64	143.84	0.21	0.41	0.46
4	Cement & Gypsum Products	13	53.06	69.61	53.53	0.06	0.08	0.06
5	Ceramics	10	131.23	165.93	131.69	0.83	1.05	0.88
6	Chemicals (other than fertilizers)	210	1493.66	1478.67	1521.57	0.26	0.27	0.20
7	Commercial, Office, Household Equipment	8	91.37	113.31	89.15	0.54	0.72	0.67
8	Consultancy Services	7	39.92	42.36	32.57	4.92	4.68	4.36
9	Defence Industries	35	491.25	417.54	591.43	6.00	4.61	5.27
10	Drugs & Pharmaceuticals	348	13726.67	13903.53	15653.36	5.84	5.40	5.27
11	Dyestuffs	7	24.14	10.33	11.09	0.36	0.15	0.19
12	Earth Moving Machinery	10	93.25	104.48	134.12	0.66	0.93	1.12
13	Electricals & Electronics	174	1446.42	1538.94	1370.30	0.65	0.70	0.63
14	Fermentation Industries	7	32.96	46.91	48.87	0.11	0.16	0.18
15	Fertilizers	19	62.11	80.41	74.19	0.24	0.32	0.28
16	Food Processing Industries	72	498.33	497.41	522.27	0.26	0.40	0.41
17	Fuels	9	18.82	13.00	13.76	0.02	0.01	0.01
18	Glass	1	0.20	0.22	0.25	0.09	0.08	0.05
19	Glue & Gelatine	4	7.87	9.54	6.08	2.40	2.27	1.61
20	Industrial Equipment	57	408.51	449.90	390.20	0.37	0.41	0.39
21	Industrial Machinery	61	184.77	227.32	170.25	0.89	1.12	0.85
22	Information Technology	36	3831.07	4313.98	4620.12	2.56	2.70	2.77
23	Leather, Leather goods & Pickers	5	6.02	8.41	3.90	0.41	0.65	0.35
24	Machine Tools	17	61.65	59.41	48.48	1.17	1.61	1.25
26	Medical & Surgical Appliances	39	171.08	209.04	202.50	4.71	5.36	4.91
27	Metallurgical Industries	40	388.75	431.85	405.91	0.27	0.35	0.30
28	Misc. Mechanical Engineering Industries	52	340.77	317.96	274.71	0.85	0.94	0.83

**Table 16 (Contd.)**  
**EXPENDITURE ON RESEARCH AND DEVELOPMENT BY**  
**INDUSTRY GROUPS FOR PRIVATE SECTOR**

S.No.	Industry Group	No. of R&D Units	R&D Expenditure					
			(Rs. Crore)			as % of S.T.O.		
			2018-19	2019-20	2020-21	2018-19	2019-20	2020-21
29	Miscellaneous Industries	82	465.33	491.11	430.95	0.78	1.57	1.50
30	Paper & Pulp	17	23.63	23.72	21.65	0.22	0.23	0.29
31	Photographic Raw Film & Paper	2	0.24	1.66	2.82	0.01	0.08	0.12
32	Prime Movers	2	62.79	63.22	64.70	1.70	1.89	2.14
33	Rubber Goods	28	194.15	212.42	196.32	0.68	0.83	0.76
34	Scientific Instruments	17	106.85	231.69	188.32	22.91	44.19	34.78
35	Soaps, Cosmetics, Toilet Preparations	13	111.63	139.13	167.79	0.22	0.27	0.28
36	Sugar	9	11.32	12.35	14.57	0.15	0.14	0.14
37	Telecommunications	17	268.35	378.87	326.89	1.81	3.08	2.59
38	Textiles (Dyed, Printed, Processed)	38	290.68	297.27	247.21	0.50	0.54	0.48
39	Timber Products	1	0.52	0.29	0.26	0.53	0.31	0.31
40	Transportation	86	3930.06	4190.27	3600.68	1.26	1.28	1.34
41	Vegetable Oil & Vanaspati	6	36.58	41.40	39.92	0.41	0.50	0.41
	<b>Total*</b>	<b>1866</b>	<b>37356.49</b>	<b>39415.75</b>	<b>41007.25</b>	<b>1.38</b>	<b>1.52</b>	<b>1.46</b>

**Source** : Data collected and compiled by DST, GoI.

**Note** : 1. S.T.O. - Sales Turn Over

2. R&D- Research and Development.

3. \* Total also include expenditure of Rs. 5399.95 crore, Rs. 5759.94 crore and Rs. 6179.94 crore for the years 2018-19, 2019-20 & 2020-21 respectively on account of data lumping in textile sector. The figures for the textile sector have accordingly been revised.



**Table 17****RESEARCH AND DEVELOPMENT EXPENDITURE BY MULTINATIONALS****(Rs. Crore)**

Type of Multinational Enterprises	No.of R&D Units	2018-19	2019-20	2021-22
Private Sector- India	233	14675.15	14999.56	15787.17
Private Sector- Foreign	139	7067.52	7747.90	7727.93
Public Sector	10	2619.31	2423.91	2429.55
<b>Total</b>	<b>382</b>	<b>24361.98</b>	<b>25171.37</b>	<b>25944.65</b>

**Source :** Data collected and compiled by NSTMIS, DST, Gol.

Table 18

## NATIONAL EXPENDITURE ON R&amp;D BY ECONOMIC ACTIVITY

(Rs. Crore)

Sl. No.	Economic Activity	NIC Code	Research & Development Expenditure		
			2018-19	2019-20	2020-21
1	Agriculture, Forestry and Fishing	1	14117.90	14606.48	14770.59
2	Mining and Quarrying	5	1357.94	1495.07	1360.21
3	Manufacture of Food Products	10	446.26	464.37	419.05
4	Manufacture of Beverages	11	58.23	66.76	67.45
5	Manufacture of Tobacco Products	12	18.69	18.29	15.62
6	Manufacture of Textiles	13	291.63	283.74	215.59
7	Manufacture of Wearing Apparel	14	79.48	82.04	76.70
8	Manufacture of Leather and Related Products	15	7.96	10.60	6.49
9	Manufacture of Wood and of Products of Wood & Cork, except Furniture	16	12.56	11.41	10.47
10	Manufacture of Paper and Paper Products	17	29.54	32.13	26.18
11	Manufacture of Coke and Refined Petroleum Products	19	1340.52	1242.77	1421.25
12	Manufacture of Chemicals and Chemical Products	20	2623.35	2761.15	2725.56
13	Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations	21	12435.44	12694.48	14396.76
14	Manufacture of Rubber and Plastic Products	22	393.88	384.87	336.07
15	Manufacture of Other Non-Metallic Mineral Products	23	10.04	12.34	10.22
16	Manufacture of Basic Metals	24	485.27	547.74	468.70
17	Manufacture of Fabricated Metal Products, except Machinery and Equipment	25	107.75	88.43	82.07
18	Manufacture of Computer, Electronic and other Optical Products	26	1518.04	1503.02	1370.84
19	Manufacture of Electrical Equipment	27	1256.12	1326.46	1070.73
20	Manufacture of Machinery and Equipment n.e.c	28	1440.09	1476.04	1400.87
21	Manufacture of Motor Vehicles, Trailers and Semi-Trailers	29	3233.86	3119.35	2620.23
22	Manufacture of Other Transport Equipment	30	235.45	241.57	186.37
23	Manufacture of Furniture	31	0.00	0.00	0.00
24	Other Manufacturing	32	2107.38	2338.49	2243.81
25	Repair and Installation of Machinery and Equipment	33	2.34	1.57	2.02
26	Electricity, Gas, Steam and Air Conditioning Supply	35	3642.08	3933.36	3250.89
27	Water Supply, Sewerage, Waste Management and Remediation activities	36	36.13	54.96	52.52
28	Construction	41	179.22	199.09	158.25

Table 18 Contd...

**Table 18 (Contd.)**  
**NATIONAL EXPENDITURE ON R&D BY ECONOMIC ACTIVITY**

(Rs. Crore)

Sl. No.	Economic Activity	NIC Code	Research & Development Expenditure		
			2018-19	2019-20	2020-21
29	Transportation and Storage	49	163.30	166.56	134.69
30	Professional, Scientific and Technical Activities	69	40305.98	42307.38	35988.24
31	Public Administration and Defence, Compulsory Social Security	84	1876.43	1567.18	2124.95
32	Education	85	5032.47	5216.81	5449.11
33	Human Health and Social Work Activities	86	6226.15	6610.90	6583.57
34	Service Sector	90	3679.90	4261.17	4431.26
35	Others	91	5791.67	7739.03	6488.77
	<b>Total*</b>		<b>115943.00</b>	<b>122625.55</b>	<b>116146.04</b>

**Source** : Data collected and compiled by DST, GoI.

- Note:** 1. National includes organisations under Central Government, State Government, Private, Public Sector, and Scientific and Industrial Research Organisations (excludes Higher Education)
2. \* Total also include expenditure of Rs. 5399.95 crore, Rs. 5759.94 crore and Rs. 6179.94 crore for the years 2018-19, 2019-20 & 2020-21 respectively on account of data lumping in textile sector. The figures for the textile sector have accordingly been revised.

**Table 19**  
**GOVERNMENT EXPENDITURE ON R&D BY ECONOMIC ACTIVITY**

(Rs. Crore)

Sl.No.	Economic Activity	NIC Code	Research & Development Expenditure			
			Units	2018-19	2019-20	2020-21
1	Agriculture, Forestry and Fishing	1	12357.05	12743.11	12826.38	9747.76
2	Mining and Quarrying	5	1257.65	1378.42	1256.25	138.81
3	Manufacture of Food Products	10	108.47	123.75	78.13	25.76
4	Manufacture of Textiles	13	86.10	83.61	56.71	123.38
5	Manufacture of Wood and of Products of Wood & Cork, except Furniture	16	12.04	11.12	10.21	124.6
6	Manufacture of Chemicals and Chemical Products	20	79.64	74.31	31.51	6.27
7	Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations	21	17.81	23.51	28.05	13.11
8	Manufacture of Rubber and Plastic Products	22	13.33	13.44	13.44	3.04
9	Manufacture of Basic Metals	24	0.99	1.82	0.04	76.70
10	Manufacture of Computer, Electronic and other Optical Products	26	3.78	3.22	3.37	0.35
11	Manufacture of Electrical Equipment	27	269.39	239.21	160.88	48.11
12	Manufacture of Machinery and Equipment n.e.c	28	64.08	50.78	46.19	14.85
13	Other Manufacturing	32	0.01	0.01	0.01	256.10
14	Electricity, Gas, Steam and Air Conditioning Supply	35	3419.21	3673.05	3051.50	0.01
15	Construction	41	8.18	19.86	2.37	45.00
16	Professional, Scientific and Technical Activities	69	38105.85	40024.01	33806.20	3.91
17	Education	85	3730.30	3937.68	3794.99	40322.29
18	Human Health and Social Work Activities	86	4238.98	4394.53	4405.67	3637.67
19	Service Sector	90	296.80	328.55	241.87	2257.97
20	Others	91	3789.73	5557.72	4348.57	324.61
	<b>Total</b>		<b>67859.39</b>	<b>72681.71</b>	<b>64162.34</b>	<b>1761.34</b>

**Source** : Data collected and compiled by NSTMIS, DST, Gol.

**Note** : Government includes organisations under Central Government and State Government.

**Table 20**  
**INDUSTRIAL SECTOR EXPENDITURE ON R&D BY ECONOMIC ACTIVITY**

(Rs. Crore)

Sl.No.	Economic Activity	NIC Code	No.of R&D Units	Research & Development Expenditure		
				2018-19	2019-20	2020-21
1	Agriculture, Forestry and Fishing	1	274	1760.85	1863.37	1944.21
2	Mining and Quarrying	5	10	100.29	116.65	103.96
3	Manufacture of Food Products	10	60	337.79	340.62	340.92
4	Manufacture of Beverages	11	6	58.23	66.76	67.45
5	Manufacture of Tobacco Products	12	2	18.69	18.29	15.62
6	Manufacture of Textiles	13	29	205.53	200.13	158.88
7	Manufacture of Wearing Apparel	14	4	79.48	82.04	76.70
8	Manufacture of Leather and Related Products	15	7	7.96	10.60	6.49
9	Manufacture of Wood and of Products of Wood & Cork, except Furniture	16	2	0.52	0.29	0.26
10	Manufacture of Paper and Paper Products	17	19	29.54	32.13	26.18
11	Manufacture of Coke and Refined Petroleum Products	19	10	1340.52	1242.77	1421.25
12	Manufacture of Chemicals and Chemical Products	20	214	2543.71	2686.84	2694.05
13	Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations	21	337	12417.63	12670.97	14368.71
14	Manufacture of Rubber and Plastic Products	22	34	380.55	371.43	322.63
15	Manufacture of Other Non-Metallic Mineral Products	23	7	10.04	12.34	10.22
16	Manufacture of Basic Metals	24	21	484.28	545.92	468.66
17	Manufacture of Fabricated Metal Products, except Machinery and Equipment	25	31	107.75	88.43	82.07
18	Manufacture of Computer, Electronic and other Optical Products	26	56	1514.26	1499.80	1367.47
19	Manufacture of Electrical Equipment	27	110	986.73	1087.25	909.85
20	Manufacture of Machinery and Equipment n.e.c	28	144	1376.01	1425.26	1354.68
21	Manufacture of Motor Vehicles, Trailers and Semi-Trailers	29	40	3233.86	3119.35	2620.23
22	Manufacture of Other Transport Equipment	30	24	235.45	241.57	186.37
23	Other Manufacturing	32	223	2107.37	2338.48	2243.80
24	Repair and Installation of Machinery and Equipment	33	3	2.34	1.57	2.02
25	Electricity, Gas, Steam and Air Conditioning Supply	35	13	222.87	260.31	199.39

**Table 20 (Contd.)**  
**INDUSTRIAL SECTOR EXPENDITURE ON R&D BY ECONOMIC ACTIVITY**

(Rs. Crore)

Sl.No.	Economic Activity	NIC Code	No.of R&D Units	Research & Development Expenditure		
				2018-19	2019-20	2020-21
26	Water Supply, Sewerage, Waste Management and Remediation activities	36	15	36.13	54.96	52.52
27	Construction	41	14	171.04	179.23	155.88
28	Transportation and Storage	49	14	163.30	166.56	134.69
29	Professional, Scientific and Technical Activities	69	178	2200.13	2283.37	2182.04
30	Public Administration and Defence, Compulsory Social Security	84	24	1876.43	1567.18	2124.95
31	Education	85	111	1302.17	1279.13	1654.12
32	Human Health and Social Work Activities	86	192	1987.17	2216.37	2177.90
33	Service Sector	90	42	3383.10	3932.62	4189.39
34	Others	91	136	2001.94	2181.31	2140.20
	<b>Total*</b>		<b>2406</b>	<b>48083.61</b>	<b>49943.84</b>	<b>51983.70</b>

**Source** : Data collected and compiled by DST, GoI.

**Note** : 1. Industrial Sector comprises of Private, Public Sector, Scientific and Industrial Research Organisations (SIROs)

2. \* Total also include expenditure of Rs. 5399.95 crore, Rs. 5759.94 crore and Rs. 6179.94 crore for the years 2018-19, 2019-20 & 2020-21 respectively on account of data lumping in textile sector. The figures for the textile sector have accordingly been revised.

Table 21

**FULL TIME EQUIVALENT OF MANPOWER EMPLOYED IN R&D  
ESTABLISHMENTS AS ON 01.04.2021**

(Number)

	Name of Establishment	Personnel Engaged in			Total (1+2+3)
		R&D Activities (1)	Auxilliary Activities (2)	Administrative Activities (3)	
<b>1.</b>	<b>INSTITUTIONAL SECTOR</b>				
	<b>A. GOVERNMENT INSTITUTIONS</b>				
	a. Major Scientific Agencies	57137	36126	29685	122948
	b. Central Government Ministries / Departments	10157	7577	8851	26585
	c. State Governments/UT	18211	8968	21829	49008
	<b>Total Government Institutions (A=a+b+c)</b>	<b>85505</b>	<b>52671</b>	<b>60365</b>	<b>198541</b>
	<b>B. HIGHER EDUCATION SECTOR</b>	137526	-	-	137526
	<b>TOTAL INSTITUTIONAL SECTOR (1= A+B)</b>	<b>223031</b>	<b>52671</b>	<b>60365</b>	<b>336067</b>
<b>2.</b>	<b>INDUSTRIAL SECTOR</b>				
	a. Public Sector including Joint Sector	7568	1152	658	9378
	b. Private Sector	103445	20111	10558	134114
	c. Scientific and Industrial Research Organisation (SIRO)	27880	21192	26080	75152
	Private Sector + SIRO (b+c)	131325	41303	36638	209266
	<b>TOTAL INDUSTRIAL SECTOR ( 2= a+b+c)</b>	<b>138893</b>	<b>42455</b>	<b>37296</b>	<b>218644</b>
	<b>Total (1+2)</b>	<b>361924</b>	<b>95126</b>	<b>97661</b>	<b>554711</b>

**Source :** Data collected and compiled by NSTMIS, DST, Gol.

- Note :**
1. Data for Industrial Sector refers to 2406 in-house R&D units including 1866 Private Sector industries, 94 Public Sector industries and 446 SIRO units.
  2. Higher Education Sector data is based on estimation by applying three years growth rate for period 2015 to 2018.
  3. - Represents not available
  4. R&D : Research and Development.

Table 22

**FULL TIME EQUIVALENT OF WOMEN EMPLOYED IN R&D  
ESTABLISHMENTS AS ON 01.04.2021**

(Number)

	Name of Establishment	Personnel Engaged in			Total (1+2+3)
		R&D Activities (1)	Auxilliary Activities (2)	Administrative Activities (3)	
<b>1</b>	<b>INSTITUTIONAL SECTOR</b>				
	<b>A. GOVERNMENT INSTITUTIONS</b>				
	a. Major Scientific Agencies	11339	5583	6151	23073
	b. Central Government Ministries / Departments	2531	1691	2067	6289
	c. State Governments/UT	4760	1833	6275	12868
	<b>Total Government Institutions (A=a+b+c)</b>	<b>18630</b>	<b>9107</b>	<b>14493</b>	<b>42230</b>
	<b>B. HIGHER EDUCATION SECTOR</b>	<b>17877</b>	-	-	<b>17877</b>
	<b>TOTAL INSTITUTIONAL SECTOR (1= A+B)</b>	<b>36507</b>	<b>9107</b>	<b>14493</b>	<b>60107</b>
<b>2</b>	<b>INDUSTRIAL SECTOR</b>				
	a. Public Sector including Joint Sector	1445	153	168	1766
	b. Private Sector	17786	3852	2172	23810
	c. Scientific and Industrial Research Organisation (SIRO)	11703	9921	10590	32214
	Private + SIRO (b+c)	29489	13773	12762	56024
	<b>TOTAL INDUSTRIAL SECTOR ( 2= a+b+c)</b>	<b>30934</b>	<b>13926</b>	<b>12930</b>	<b>57790</b>
	<b>Total (1+2)</b>	<b>67441 (18.6%)</b>	<b>23033 (24.2%)</b>	<b>27423 (28.1%)</b>	<b>117897 (21.3%)</b>

**Source :** Data collected and compiled by NSTMIS, DST, GoI.

**Note :** 1. Data for Industrial Sector refers to 2406 in-house R&D units including 1866 Private Sector industries, 94 Public Sector industries and 446 SIRO units.

2. Higher Education Sector data is based on estimation by applying three years growth rate for period 2015 to 2018.

3.- Represents not available

4. R&D : Research and Development.



Table 23

**FIELD OF SPECIALIZATION OF FULL TIME PERSONNEL EMPLOYED IN R&D  
AS ON 01.04.2021**

(Number)

Field of Specialization	Male	Female	Transgender	Total
Agricultural Sciences	21445	6326	-	27771
Engineering Technology	99048	21079	-	120127
Medical Sciences	27811	11442	-	39253
Natural Sciences	22682	8360	-	31042
Social Sciences	3847	2357	1	6205
<b>Total</b>	<b>174833</b>	<b>49564</b>	<b>1</b>	<b>224398</b>

**Source** : Data collected and compiled by NSTMIS, DST, Gol.

**Note** : 1. Data analysed is based on the Survey responses. Data includes all sectors except Higher Education. In case of Higher Education, field of specialization of full time personnel employed in R&D is not available.  
2. - Represents nil

**Table 24**  
**UNIVERSITIES / COLLEGES AND THEIR ENROLMENT**  
**FROM 1976-77 TO 2020-21**

(Number)

Year	Universities	Institutions/Deemed to be Universities	Colleges	Total Enrolment
1976-77	105	9	4317	2431563
1977-78	108	9	4375	2564972
1978-79	108	10	4460	2618228
1979-80	112	10	4558	2648579
1980-81	116	12	4722	2752437
1981-82	120	12	4880	2952066
1982-83	125	14	5039	3133093
1983-84	126	14	5246	3307649
1984-85	132	16	5590	3404096
1985-86	136	17	5816	3605029
1986-87	143	21	6040	3757158
1987-88	144	22	6685	4020159
1988-89	145	27	6773	4285489
1989-90	149	28	7145	4602680
1990-91	150	29	7346	4924868
1991-92	155	31	7761	5265886
1992-93	159	31	7993	5534966
1993-94	163	34	8441	5817249
1994-95	168	36	9019	6113929
1995-96	171	37	9252	6574005
1996-97	172	38	9940	6842598
1997-98	182	39	10678	7260418
1998-99	182	40	11397	7705520
1999-00	189	42	11865	8050607
2000-01	193	47	12806	8399443
2001-02	196	52	15437	8964680
2002-03	200	81	16206	9516773
2003-04	213	89	16742	10201981
2004-05	229	96	18080	11038543

Table 24 Contd...

**Table 24 (Contd.)**  
**UNIVERSITIES/COLLEGES AND THEIR ENROLMENT**  
**FROM 1976-77 TO 2020-21**

(Number)

Year	Universities	Institutions/Deemed to be Universities	Colleges	Total Enrolment
2005-06	241	101	19327	12043050
2006-07	249	109	21170	13163054
2007-08	272	103	23206	14400381
2008-09	300	128	25951	15768417
2009-10	363	130	31812	17243352
2010-11	621	131	32974	27499749
2011-12	642	128	34852	29184331
2012-13	667	127	35525	30152417
2013-14	723	127	36634	32336234
2014-15	760	122	38498	34211637
2015-16	799	122	39071	34584781
2016-17	864	122	40026	35705905
2017-18	903	123	39050	36642378
2018-19	993	124	39931	37399388
2019-20	1043	126	42343	38536359
2020-21	1113	124	43796	41380713

**Source :** UGC Annual Reports and All India Survey of Higher Education (AISHE) Reports, MoE.

**Note :** 1. Series revised from 2010-11 as per the various AISHE, MoE survey reports.

2. The number of Universities since 2010-11 onwards also include Institutions of National Importance.

3. Figures of students enrolment pertain to regular/distance mode courses in universities and colleges including Standalone Institutions such as polytechnics, Institutes under central ministries, Nursing Institutes, Teacher training Institutes etc awarding diploma and certificate.

**Table 25**  
**PUBLIC EXPENDITURE ON EDUCATION AND**  
**GROSS DOMESTIC PRODUCT (GDP)**

(Rs. Crore)

Year	GDP at Current price (at Factor cost)	Total Expenditure on Education by Education & other Departments	Expenditure on Education by Education & other Departments as % of GDP
1951-52	10080	64.46	0.64
1960-61	16220	239.56	1.48
1970-71	42222	892.36	2.11
1980-81	130178	3884.20	2.98
1990-91	510964	19615.85	3.84
2000-01	1991982	82486.48	4.14
2005-06	3390503	113228.71	3.34
2006-07	3953276	137383.99	3.48
2007-08	4582086	155797.27	3.40
2008-09	5303567	189068.84	3.56
2009-10	6108903	241256.02	3.95
2010-11	7248860	293478.23	4.05
2011-12	8736329	333930.38	3.82
2012-13	9944013	368132.87	3.70
2013-14	11233522	430878.82	3.84
2014-15	12467959	506849.14	4.07
2015-16	13771874	577792.52	4.20
2016-17	15391669	653099.33	4.24
2017-18	17090042	662151.45	3.87
2018-19	18899668.44	736581.25	3.90
2019-20 (RE)	20074855.79	863117.55	4.30
2020-21 (BE)	19800913.82	919145.19	4.64

**Source:** Analysis of Budgeted Expenditure on Education Report, 2018-19 to 2020-21, MoE

**Note:** RE: Revised Estimate, BE: Budget Estimate

Table 26

## DOCTORATE DEGREES AWARDED FACULTY-WISE, 2012-13 TO 2020-21

(Number)

Faculty	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Science	4381	5910	5721	6678	8089	8914	10055	9172	6232
Engineering/Technology	2477	3074	2918	3272	3749	5289	7659	6627	5001
Medicine	1644	900	985	1226	1507	1422	1606	2120	1757
Agriculture	3473	2346	1810	2062	1951	4465	4748	4990	1793
Veterinary Science	200	281	279	291	295	298	406	444	200
Total S&T- (A)	12175	12511	11713	13529	15591	20388	24474	23353	14983
Others- (B)	11455	11350	10117	10642	13188	14012	16339	15633	10567
Total (A+B)	23630	23861	21830	24171	28779	34400	40813	38986	25550
% in Science & Technology(S&T) Disciplines									
Faculty	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Science	36.00	47.20	48.80	49.40	51.90	43.70	41.10	39.30	41.60
Engineering/Technology	20.30	24.60	24.90	24.20	24.00	25.90	31.30	28.40	33.40
Medicine	13.50	7.20	8.40	9.10	9.70	7.00	6.60	9.10	11.70
Agriculture	28.50	18.80	15.50	15.20	12.50	21.90	19.40	21.40	11.80
Veterinary Science	1.60	2.20	2.40	2.20	1.90	1.50	1.70	1.90	1.30
Total (S&T)- A	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

**Source :** All India Survey of Higher Education (AISHE) Reports, MoE

**Note :** Engineering/Technology includes IT & Computer; Agriculture includes Fisheries Science, Science includes Marine Science/Oceanography; Others includes Arts, Commerce, Law, Education, Library & Information Science; Music, Performing/Visual Arts, Journalism & Mass Communication, Physical Education & Social Work etc.

Table 27

## DOCTORAL DEGREE AWARDED BY SELECT COUNTRY AND FIELD, 2018

(Number)

SI No.	Country	All fields	All S&E	Physical / biological sciences and mathematics and statistics	Computer sciences	Agricultural sciences	Social and behavioral sciences	Engineering	Non S&E
		(1)=2+8	(2)=3+4+5+6+7	(3)	(4)	(5)	(6)	(7)	(8)
1	United States	72,731	41,071	17,076	1,996	1,021	9,802	11,176	31,660
2	China <sup>a</sup>	60,724	39,768	12,831	NA	2,762	2,142	22,033	20,956
<b>3</b>	<b>India</b>	<b>40,813</b>	<b>24,474</b>	<b>11,661</b>	<b>499</b>	<b>5,154</b>	<b>#</b>	<b>7,160</b>	<b>16,339</b>
4	United Kingdom	29,469	17,366	8,737	1,216	364	2,750	4,299	12,103
5	Germany	27,838	15,061	8,084	873	821	1,672	3,611	12,777
6	Brazil	22,927	11,365	3,413	346	2,559	1,720	3,327	11,562
7	Russia	18,322	10,410	3,085	839	861	2,770	2,855	7,912
8	Spain	17,286	9,480	5,177	822	288	1,950	1,243	7,806
9	France	13,729	8,987	4,723	709	155	1,419	1,981	4,742
10	South Korea	14,674	7,077	1,862	495	332	727	3,661	7,597
11	Japan <sup>b</sup>	15,690	6,754	2,090	NA	899	415	3,350	8,936
12	Canada	8,247	5,888	2,127	280	299	1,454	1,728	2,359
13	Australia	8,777	5,332	2,094	368	319	962	1,589	3,445
14	Italy	7,974	4,758	1,882	188	382	520	1,786	3,216
15	Turkey	7,332	3,637	1,239	39	322	616	1,421	3,695
16	Mexico	10,486	3,180	1,227	98	219	973	663	7,306
17	Switzerland	4,163	2,531	1,297	118	107	365	644	1,632
18	Taiwan	3,423	1,949	572	141	63	126	1,047	1,474
19	Sweden	3,212	1,806	616	171	35	259	725	1,406
20	South Africa (2015)	2,536	1,313	616	51	121	304	221	1,223
21	Israel	1,570	982	526	72	26	182	176	588
22	Romania	1,843	811	155	61	100	169	326	1,032

**Source :** 1. Science and Engineering Indicators 2022, NSF, USA

2. India- All India Survey of Higher Education (AISHE) Reports, MoE

**Note :** 1. S&E- Science and Engineering, Non-S&E includes Arts, Commerce, Law, Education etc

2. India- Physical and Biological Sciences includes Science & Medicine; Agricultural Sciences includes Veterinary Science; # merged with Non-S&E.

3. Countries are ranked based on the Doctoral degrees in S&E field.

4. Physical and biological sciences and mathematics and statistics include biological and related sciences, environmental sciences, and physical sciences.

5. Computer sciences include information and communication technologies.

6. Agricultural sciences include agriculture, forestry, fisheries, and veterinary sciences.

7. Social and behavioral sciences include social and behavioral sciences and also journalism and information.

8. Engineering includes engineering and engineering trades, manufacturing and processing, and architecture and construction.

9. <sup>a</sup> China data include computer science under engineering, <sup>b</sup> Japan data include computer sciences under engineering.

**Table 28**  
**Top 15 countries of origin of U.S. doctorate recipients on temporary visas,**  
**by broad doctoral field: 2001–20**

Country	All fields	All S&E fields	Engineering	Agricultural sciences	Biological sciences	Computer sciences	Earth, atmospheric, and ocean sciences	Mathematics	Medical and other health sciences	Physical sciences	Psychology	Social sciences	Non-S&E
All countries of origin (214 countries) <sup>a</sup>	290,832	249,178	87,151	9,070	39,049	17,368	5,733	14,400	9,501	33,483	4,894	28,529	41,654
Top 15 countries of origin	241,342	210,097	77,595	6,629	32,961	15,287	4,691	12,001	7,761	28,509	3,722	20,941	31,245
China <sup>b</sup>	88,512	81,803	30,599	2,128	13,496	6,408	2,072	6,268	1,907	13,086	826	5,013	6,709
<b>India</b>	<b>36,565</b>	<b>34,241</b>	<b>14,397</b>	<b>891</b>	<b>6,922</b>	<b>2,956</b>	<b>419</b>	<b>930</b>	<b>1,667</b>	<b>4,022</b>	<b>316</b>	<b>1,721</b>	<b>2,324</b>
South Korea	25,994	19,781	8,023	595	2,255	1,040	295	950	775	1,899	536	3,413	6,213
Taiwan	12,648	9,765	3,418	257	1,954	483	170	393	751	1,066	267	1,006	2,883
Canada	9,027	6,399	1,060	179	1,326	267	220	331	361	753	733	1,169	2,628
Turkey	8,887	7,372	3,104	227	677	511	81	397	61	723	169	1,422	1,515
Iran	7,338	6,949	4,834	75	258	575	103	191	65	575	36	237	389
Thailand	5,166	4,494	1,701	359	533	245	44	164	497	406	35	510	672
Japan	4,121	3,100	479	77	447	84	92	96	165	353	182	1,125	1,021
Mexico	4,089	3,451	912	400	493	124	131	202	86	332	46	725	638
Germany	3,759	2,905	494	75	471	187	130	222	70	482	144	630	854
Saudi Arabia	3,426	2,524	872	69	275	340	57	94	405	136	31	245	902
Brazil	3,415	2,881	534	413	554	180	96	137	174	144	49	600	534
Russia	3,034	2,652	395	17	361	153	85	283	20	881	47	410	382
Italy	2,973	2,271	596	47	245	114	93	176	24	335	43	598	702

**Source :** Science and Engineering Indicators 2022, NSF, USA.

**Note :** 1. <sup>a</sup> Excludes cases with unknown country of origin.

2. <sup>b</sup> China includes Hong Kong.

3. Data include temporary residents and non-U.S. citizens with unknown visa status. Rank is based on total number of doctorates.

**Table 29**  
**RESEARCHERS PER MILLION INHABITANTS (FTE)**  
**FOR SELECT COUNTRIES, 2020**

SI No	Country	Reseachers Per Million People	Population in Million	Number of Researchers (FTE)
1	Australia	4532	25.50	100414
2	Brazil	888	212.56	179989
3	Canada	4516	37.74	182760
4	China	1585	1439.32	2281134
5	Denmark	7692	5.79	44553
6	Finland	7527	5.54	41707
7	France	4926	65.27	321550
8	Germany	5393	83.78	450796
9	Hungary	4358	9.66	42099
<b>10</b>	<b>India</b>	<b>262</b>	<b>1380.00</b>	<b>361924</b>
11	Israel	8342	8.66	63521
12	Italy	2672	60.46	156989
13	Japan	5455	126.26	689889
14	Malaysia	741	32.37	73537
15	Mexico	349	128.93	44966
16	Netherlands	5912	17.14	102077
17	New Zealand	5854	4.82	28000
18	Norway	6699	5.42	36316
19	Pakistan	383	220.89	69769
20	Philippines	174	109.58	10791
21	Republic of Korea	8714	51.27	446739
22	Russian Federation	2722	145.93	397187
23	Singapore	7287	5.85	42295
24	South Africa	484	59.31	28358
25	Spain	3109	46.76	145372
26	Sri Lanka	106	21.41	2216
27	Sweden	7930	10.10	80089
28	Switzerland	5552	8.66	47699
29	United Kingdom	4684	67.89	316296
30	USA	4821	331.50	1586497
31	Venezuela	291	28.44	8963
<b>32</b>	<b>World</b>	<b>1368</b>	<b>7623.14</b>	<b>8854290</b>

**Source :** UNESCO website, Main Science and Technology Indicators (MSTI), OECD, September 2022 & World Bank website accessed March, 2023 ; India-R&D Statistics 2022-23, DST, Gol.s

**Note :** : S&T Indicator- Reference years:

1. Researcher per Million People (UNESCO); 2019- Pakistan, New Zealand, Singapore, South Africa, Switzerland, UK, USA; 2018- Canada, Philippines, Sri Lanka, World; 2014- Brazil; 2012- Israel; 2010- Australia
2. Researchers (FTE) :MSTI, Sept. 2022 & UNESCO- Brazil, Malaysia, Pakistan, Philipines, Sri Lanka, Venezuela, Israel 2019- Canada, New Zealand, Switzerzeland, UK, US, Singapore, South Africa; 2016- Malaysia, Venezuela; 2015- Philippines, Sri Lanka; 2014- Brazil; 2012- Israel; 2010- Australia
3. Population : Japan, USA-World Bank website & other countries data-UNESCO



Table 30

### R&D EXPENDITURE PER CAPITA AND GDP FOR SELECT COUNTRIES, 2020 (IN PPP US\$)

Country	R&D Expenditure(billion current PPP \$)	R&D Exp. as % of GDP	Per capita GDP (current PPP\$)	Per capita R&D (current PPP\$)	R&D per Researcher, FTE ('000 current PPP\$)
Australia	24.0	1.8	55635.5	946.6	239
Brazil	41.1	1.3	15662.2	197.9	234
Canada	32.6	1.8	46572.1	857.8	179
China	583.8	2.4	17217.9	413.4	256
Denmark	10.4	3.0	60098.5	1784.2	233
Finland	8.2	2.9	50924.8	1483.5	197
France	74.6	2.3	46713.8	1096.5	232
Germany	144.4	3.1	55461.2	1735.8	320
Hungary	5.2	1.6	33274.3	531.7	123
<b>India</b>	<b>57.9</b>	<b>0.6</b>	<b>6525.0</b>	<b>42.0</b>	<b>160</b>
Israel	19.8	5.4	39492.6	2146.7	311
Italy	37.7	1.5	41995.3	634.3	240
Japan	174.1	3.3	42285.3	1384.7	252
Korea	112.9	4.8	45274.1	2179.7	253
Mexico	7.2	0.3	18962.6	56.4	159
Netherlands	23.9	2.3	59001.2	1369.9	234
New Zealand	3.2	1.4	44698.3	635.4	114
Norway	7.7	2.3	62650.4	1427.2	211
Russian Federation	48.0	1.1	29819.0	327.4	121
Singapore	11.0	1.9	98148.7	1937.0	260
South Africa	5.1	0.6	12293.5	88.7	182
Spain	25.1	1.4	37764.1	530.7	173
Sweden	20.1	3.5	55631.0	1941.3	251
Switzerland	19.4	3.2	71732.0	2266.8	408
United Kingdom	56.0	1.7	46526.9	838.1	177
USA	720.9	3.5	63285.2	2183.5	454

**Source** : Main Science and Technology Indicators (MSTI), OECD, September 2022, UNESCO website & India- R&D Statistics, 2022-23

**Note** : S&T Indicator- Reference years:

1. R&D Exp. & R&D Exp. to GDP: MSTI, Sept. 2022 & UNESCO- Brazil  
2019-Australia, New Zealand, Singapore, South Africa, Switzerzlerland, UK; 2014- Brazil
2. Per capita R&D (current PPP\$): MSTI, Sept. 2022 & UNESCO- Brazil  
2019- Australia, New Zealand, Switzerland, UK; 2014- Brazil;
3. R&D per Researcher, FTE ('000 PPP\$): MSTI, Sept. 2022 & UNESCO- Brazil  
2019- Canada, New Zeland, Switzerzlerland, UK, USA, Singapore, South Africa; 2014- Brazil; 2010- Australia

Table 31

### SCIENCE AND ENGINEERING (S&E) ARTICLES IN ALL FIELDS, FOR REGIONS, COUNTRIES, OR ECONOMIES (NSF): 2010 AND 2020

Rank 2020	Region, country, or economy	2010	2020	2020 world total (%)	Average compound annual growth rate, 2010-20(%)
1	China	308,769	669,744	22.77	8.05
2	United States	409,512	455,856	15.50	1.08
<b>3</b>	<b>India</b>	<b>60,555</b>	<b>149,213</b>	<b>5.07</b>	<b>9.44</b>
4	Germany	97,255	109,379	3.72	1.18
5	United Kingdom	94,081	105,564	3.59	1.16
6	Japan	108,534	101,014	3.43	-0.72
7	Russia	33,855	89,967	3.06	10.27
8	Italy	58,252	85,419	2.90	3.90
9	South Korea	50,224	72,490	2.46	3.74
10	Brazil	41,501	70,292	2.39	5.41
11	France	68,300	66,479	2.26	-0.27
12	Canada	56,445	65,822	2.24	1.55
13	Spain	49,031	65,638	2.23	2.96
14	Australia	41,661	60,891	2.07	3.87
15	Iran	24,694	57,755	1.96	8.87
	<b>World</b>	<b>1,938,121</b>	<b>2,940,807</b>	<b>na</b>	<b>4.26</b>

**Source** : Science and Engineering Indicators 2022, NSF, USA

**Note** : 1. The countries or economies are ranked based on the 2020 total.

2. na = not applicable.

3. Article counts refer to publications from conference proceedings and peer-reviewed journal articles in S&E and indexed in Scopus.

4. Articles are classified by their year of publication and are assigned to a region, country, or economy on the basis of the institutional address(es) of the author(s) listed in the article. Articles are credited on a fractional count basis.

**Table 32**  
**PATENTS APPLICATIONS FROM PERSONS IN INDIA AND ABROAD,**  
**2000-01 TO 2021-22**

	2000-01	2005-06	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
India	2179	4521	8312	8921	9911	10941	12071	13066	13219	15550	17005	20843	24326	29508
Foreigners Resident abroad	6324	19984	31088	34276	33763	32010	30692	33838	32225	32304	33654	35625	34177	36932
<b>Total</b>	<b>8503</b>	<b>24505</b>	<b>39400</b>	<b>43197</b>	<b>43674</b>	<b>42951</b>	<b>42763</b>	<b>46904</b>	<b>45444</b>	<b>47854</b>	<b>50659</b>	<b>56468</b>	<b>58503</b>	<b>66440</b>

**Source :** Annual Reports of the Controller General of Patents, Designs and Trade Marks.

**Note :** Foreigners Resident Abroad includes Ordinary, Convention & National Phase Applications under PCT since 2000-01 onwards.

**Table 33**  
**PATENTS APPLICATIONS FILED IN INDIA BY FOREIGN COUNTRIES, 2000-01 TO 2021-22**

Sl. No.	Country	2000-01	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
1.	U.S.A.	2271	8048	8389	10653	10978	9154	10405	10600	10295	10113	9702	11815	10883	10179	9959	10564	10487	12087
2.	Germany	829	1736	2329	2908	3323	3111	3653	4174	4096	3553	3089	2965	2818	2773	2702	2700	2589	2681
3.	U.K.	359	796	933	1091	1178	972	965	1187	1075	1085	1059	1165	1008	1136	1097	959	965	1072
4.	France	309	1022	1226	1522	1671	1394	1609	1670	1666	1535	1469	1263	1214	1184	1213	1176	1045	1186
5.	Japan	787	1555	1887	2453	2962	3040	4117	5349	6284	5566	5425	4835	4275	4487	4698	4908	4782	4833
6.	Switzerland	338	927	1330	1647	1685	1579	1651	1671	1683	1756	1549	1385	1467	1268	1330	1072	1084	1334
7.	Italy	86	377	576	686	656	560	608	712	651	622	583	612	551	577	586	569	556	556
8.	Russia	23	34	45	37	63	45	55	71	85	73	90	93	67	93	65	80	56	101
9.	Netherlands	202	837	1108	1332	1544	1316	1336	1670	1203	1384	1323	1498	1359	1387	1130	1252	994	1015
10.	Others	1120	4652	5803	6849	6591	6072	6689	7172	6725	6323	6403	8207	8583	9220	11397	12345	11096	7439
	<b>Total #</b>	<b>6324</b>	<b>19984</b>	<b>23626</b>	<b>29178</b>	<b>30651</b>	<b>27243</b>	<b>31088</b>	<b>34276</b>	<b>33763</b>	<b>32010</b>	<b>30692</b>	<b>33838</b>	<b>32225</b>	<b>32304</b>	<b>33654</b>	<b>35625</b>	<b>34177</b>	<b>36932</b>

**Source :** Annual Reports of the Controller General of Patents, Designs and Trade Marks.

**Note :** # Includes Ordinary, Convention & National Phase Applications under PCT.

Table 34

**PATENTS APPLICATIONS FILED BY DIFFERENT STATES IN INDIA,  
2017-18 TO 2021-22**

(Number)

Sl No.	State/Union Territory	2017-18	2018-19	2019-20	2020-21	2021-22
1	Andhra Pradesh	276	323	484	709	934
2	Bihar	63	49	50	62	80
3	Delhi	1432	1322	1440	1608	1673
4	Gujarat	712	868	885	921	1067
5	Haryana	449	520	672	765	998
6	Karnataka	2022	2185	2230	2784	3222
7	Kerala	312	277	361	426	454
8	Madhya Pradesh	191	195	285	398	488
9	Maharashtra	3820	4257	4741	4214	4566
10	Punjab	247	661	1435	1650	2197
11	Rajasthan	189	305	273	449	465
12	Tamil Nadu	2742	2391	3546	3945	5262
13	Telangana	823	1045	1239	1662	1750
14	Uttar Pradesh	721	972	1176	2317	3622
15	West Bengal	538	529	612	505	453
	Others (States/UTs)	1013	1106	1414	1911	2277
	<b>Total</b>	<b>15550</b>	<b>17005</b>	<b>20843</b>	<b>24326</b>	<b>29508</b>

**Source :** Annual Reports of the Controller General of Patents, Designs and Trade Marks.

**Table 35**  
**PATENTS FILED AND SEALED IN INDIA, 1976-77 TO 2021-22**

Year	No. of applications made	No. of applications brought forward from preceding year	Total No. of applications to be examined	No. of applications examined	No. of applications deemed to have been abandoned filling of complete specifications	Total No. of complete specifications notified as accepted the year	No. of applications deemed to have been abandoned non-acceptance of Complete Specifications	No. of patents sealed Indian	Foreign	No. of patents in force Indian	Foreign	(Number)	
												No. of patents in force Indian	No. of patents in force Foreign
1	2	3	4	5	6	7	8	9	10	11	12	11	12
1976-77	3104	3876	6980	3612	295	2840	533	928	1964	2746	19780	2746	19780
1977-78	2870	3067	5937	2369	378	2507	577	657	1857	3065	19795	3065	19795
1978-79	2932	3190	6122	1266	283	2070	498	281	499	2469	13966	2469	13966
1979-80	2980	4573	7533	1498	304	1210	429	516	1657	2786	14474	2786	14474
1980-81	2954	5751	8705	2301	325	1007	372	349	670	2757	14448	2757	14448
1981-82	2989	6079	9068	2984	274	1191	422	421	936	3038	14892	3038	14892
1982-83	3085	5810	8895	3165	310	1580	734	405	822	3329	15291	3329	15291
1983-84	3145	5420	8565	3043	295	1447	774	340	980	3523	15726	3523	15726
1984-85	3319	5227	8546	2270	224	3267	710	263	1206	3008	13162	3008	13162
1985-86	3526	6052	9578	2490	214	1495	824	451	1500	2549	10844	2549	10844
1986-87	3489	6874	10363	4846	267	1706	729	532	1594	2004	10059	2004	10059
1987-88	3457	5250	8707	3582	158	2966	912	588	1516	2150	10115	2150	10115
1988-89	3598	4967	8565	3650	166	2386	1049	795	2585	2584	11015	2584	11015
1989-90	3661	4746	8407	3333	225	1760	984	519	1371	2468	10941	2468	10941
1990-91	3764	4849	8613	2185	183	2170	878	379	1112	2238	8210	2238	8210
1991-92	3552	6255	9807	2431	213	2060	789	551	1125	1206	9093	1206	9093
1992-93	3467	7163	10630	2347	289	1600	567	251	1021	1034	8997	1034	8997
1993-94	3869	7994	11863	2590	224	1250	686	442	1304	1995	7281	1995	7281
1994-95	5330	9049	14379	2745	130	1590	765	476	1283	1923	7052	1923	7052
1995-96	7036	11504	18540	2862	204	1400	972	415	1118	2098	6694	2098	6694
1996-97	8562	15474	24036	3042	375	2049	675	293	614	2003	7202	2003	7202
1997-98	10155	20619	30774	2688	59	2580	803	619	1225	2047	6882	2047	6882
1998-99	8954	28027	36981	2931	820	1600	804	645	1155	2088	6691	2088	6691

**Table 35 (Contd.)**  
**PATENTS FILED AND SEALED IN INDIA, 1976-77 TO 2021-22**

Year	(Number)										
	No. of applications made	No. of applications brought forward from preceding year	Total No. of applications to be examined	No. of applications examined	No. of applications deemed to have been abandoned filing of complete specifications	Total No. of complete specifications notified as accepted the year	No. of applications deemed to have been abandoned non-acceptance of Complete Specifications	No. of patents sealed Indian	Foreign	No. of patents in force Indian	Foreign
1999-00	4824	33230	38054	2824	362	1310	195	557	1324	2200	6458
2000-01	8503	34968	43471	4264	89	1950	460	399	919	1495	6530
2001-02	10592	39118	49710	5104	325	1669	1031	654	937	1578	6742
2002-03	11466	44281	55747	9538	290	2780	1633	494	885	1479	6519
2003-04	12613	NA	12362	10709	933	2805	1695	945	1524	2075	4331
2004-05	17466	NA	19001	14813	267	3307	775	764	1147	2200	4657
2005-06	24505	NA	21926	11569	414	NA	894	1396	2924	4486	11933
2006-07	28940	NA	20645	14119	694	NA	1121	1907	5632	3473	13593
2007-08	35218	NA	22146	11751	1066	NA	479	3173	12088	7966	21722
2008-09	36812	NA	30595	10296	888	NA	1075	2541	13520	6158	24664
2009-10	34287	NA	28653	6069	2720	NA	5171	1725	4443	6781	30553
2010-11	39400	NA	31493	11208	185	NA	5186	1273	6236	7301	32293
2011-12	43197	NA	33811	NA	698	NA	3800	699	3682	7545	32444
2012-13	43674	NA	36247	NA	361	NA	4559	716	3410	8303	35612
2013-14	42951	NA	37474	NA	224	NA	6418	634	3592	7464	35168
2014-15	42763	NA	34958	NA	12	NA	6970	684	5294	7561	35695
2015-16	46904	NA	35960	NA	1226	NA	12782	918	5408	7306	37218
2016-17	45444	NA	38578	NA	4357	NA	10408	1315	8532	7660	41105
2017-18	47854	NA	37208	NA	184	NA	24992	1937	11108	8830	47934
2018-19	50659	NA	38665	NA	3779	NA	30458	2511	12772	9787	54899
2019-20	56267	NA	42007	NA	3761	NA	23291	4003	20933	12181	69098
2020-21	58503	NA	42196	NA	295	NA	17944	5629	22756	15687	83211
2021-22	66440	NA	46230	NA	0	NA	1	6397	23676	19700	96216

Source : Annual Reports of the Controller General of Patents, Design and Trade Marks

Table 36

### TOP INDIAN APPLICANTS FOR PATENTS FROM SCIENTIFIC RESEARCH AND DEVELOPMENT ORGANISATIONS, 2019-20 TO 2021-22

(Number)

Name of Scientific and Research & Development Organizations.	2019-20	2020-21	2021-22
Council of Scientific & Industrial Research	169	200	223
Chairman, Defence Research & Development Organisation	89	80	117
L&T Technology Services Limited			68
Indian Council of Agricultural Research	40	77	66
Indian Council of Medical Research	10	15	37
Indian Space Research Organisation	14	23	36
Centre of Excellence in Wireless Technology	10	#	17
Solara Active Pharma Sciences Limited	13	#	11
Anthem Biosciences Pvt. Ltd.	#	#	10
Zydus Lifesciences Ltd.	#	#	9
Sun Pharma Advanced Research Company Limited	#	#	9
Bharath Institute of Higher Education and Research	#	93	#
National Institute of Pharmaceutical Education and Research, Raebareli	#	31	#
JSS Academy of Higher Education and Research	#	24	#
International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI)	#	14	#
St. Peter's Institute of Higher Education and Research	#	14	#
Simulator Development Division (SDD), Secunderabad	#	12	#
Meril Life Sciences Pvt. Ltd.	22	#	#
Sree Chitra Tirunal Institute for Medical Sciences and Technology	19	#	#
Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology	18	#	#
Translational Health Science and Technology Institute	15	#	#
Jawaharlal Nehru Centre for Advance Scientific Research	10	#	#

**Source** : Annual Reports of the Controller General of Patents, Design and Trade Marks (various issues)

**Note** : 1. # During the period under reference these organisations did not fall among top patentees  
2. The figures are arranged in the descending order by the reference year 2021-22



Table 37

**TOP INDIAN APPLICANTS FOR PATENTS FROM INSTITUTES  
AND UNIVERSITIES, 2019-20 TO 2021-22**

(Number)

Name of Institutes/Universities	2019-20	2020-21	2021-22
Sanskriti University	150	301	703
Chandigarh University	400	416	703
Indian Institute of Technology (Collective)	664	640	597
Lovely Professional University	442	545	529
Chandigarh Group of Colleges	210	352	504
Galgotias University	#	180	417
Teerthanker Mahaveer University	#	182	404
Shobhit Institute of Engineering & Technology (Deemed to be University)	#	#	224
Amity University	179	208	203
Shoolini University of Biotechnology and Management Sciences	80	#	185
Jain Deemed-To-Be-University, Bangalore	#	#	126
GLA University, Mathura	#	118	126
SRM Institute of Science and Technology	56	161	#
Bharath Institute of Higher Education and Research	251	#	#
Shiksha 'O' (Anusandhan Deemed to be University)	101	#	#

**Source** : Annual Reports of the Controller General of Patents, Design and Trade Marks (various issues)

**Note** : 1. # During the period under reference these organisations did not fall among top patentees  
2. The figures are arranged in the descending order by the reference year 2021-22

Table 38

## TOP FOREIGN RESIDENT APPLICANTS IN INDIA, 2019-20 TO 2021-22

(Number)

Name of Organisation	2019-20	2020-21	2021-22
Qualcomm Incorporated	1410	1079	1622
Samsung Electronics Co. Ltd.	1300	1255	1294
Huawei Technologies Co.Ltd.	1448	1048	849
Microsoft Technology Licensing LLC	505	418	645
Telefonaktiebolaget L M Ericsson (Publ)	508	431	437
Apple Inc.	#	#	365
Guangdong Oppo Mobile Telecommunications Corp. Ltd.	779	661	344
Google LLC	#	#	341
Vivo Mobile Communication Co. Ltd.	#	#	293
LG Electronics Inc.	#	#	289
Koninklijke Philips N.V.	397	313	#
Ethicon LLC	#	277	#
Nokia Technologies OY	#	263	#
Beijing Xiaomi Mobile Software Co. Ltd.	#	258	#
Honda Motor Co. Ltd.	391	#	#
Alibaba Group Holding Limited	352	#	#
Signify Holding B.V.	273	#	#

**Source:** Annual Reports of the Controller General of Patents, Design and Trade Marks (various issues)

**Note :** 1. # During the period under reference these organisations did not fall among top patentees  
2. The figures are arranged in the descending order by the reference year 2021-22

**Table 39**  
**YEAR-WISE PROGRESS OF EXPENDITURE OF SELECT CENTRAL SCIENTIFIC DEPARTMENTS**

Sl No	Agency	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-2018	2018-19	2019-20	2020-21	2021-22	2022-23*	2023-24#
1	DST	2038.30	2279.93	2511.66	2514.91	2600.84	2889.84	3644.29	4217.08	4595.73	4912.54	5407.03	4893.56	5140.26	4904.97	7931.05
2	DSIR/ CSIR	2697.31	2982.68	3214.70	2945.66	3159.54	3393.53	4020.98	4030.48	4618.83	4548.78	4871.63	4198.82	5122.99	5941.61	5746.51
3	DBT	906.66	1144.86	1208.44	1282.84	1291.32	1346.97	1554.27	1895.50	2331.42	2379.10	2358.77	2259.10	2850.73	2192.92	2683.86
4	DOS	4162.95	4482.23	3784.27	4856.28	5168.96	5798.81	6920.01	7988.87	9127.16	11188.37	13017.61	9474.41	12473.84	10530.04	12543.91
5	DAE (R&D Sector)	1619.27	1817.09	2193.87	2639.98	2842.30	2683.08	4891.13	5073.79	5786.35	5715.54	6483.57	5913.91	6111.46	7714.62	7618.13
6	MoES	1079.83	1094.53	1170.27	1172.40	1243.30	1293.87	1292.45	1361.28	1541.47	1726.10	1711.87	1274.54	2184.43	2056.47	3319.88
	<b>Total</b>	<b>12504.32</b>	<b>13801.32</b>	<b>14083.21</b>	<b>15412.07</b>	<b>16306.26</b>	<b>17406.10</b>	<b>22323.13</b>	<b>24567.00</b>	<b>28000.96</b>	<b>30470.43</b>	<b>33850.48</b>	<b>28014.34</b>	<b>33883.71</b>	<b>33340.63</b>	<b>39843.34</b>

(Rs. Crore)

**Source** : Demands for Grants of Central Government, Expenditure Budget, Gol (various years)**Note** : 1. Expenditure includes plan + non-plan figures

2.\* Revised Estimates(RE) ; # Budget Estimate(BE)

3. DST - Deptt. of Science &amp; Technology

4. DSIR/CSIR - Deptt. of Scientific &amp; Industrial Research/ Council of Scientific and Industrial Research.

5. DBT - Deptt. of Biotechnology

6. DOS - Deptt. of Space.

7. DAE - Deptt. of Atomic Energy

8. MoES - Ministry of Earth Sciences formerly Deptt. of Ocean Development





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