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Karan Sharma | David Kaldewey

HIGHER EDUCATION IN INDIA:
BEYOND INSTITUTES OF NATIONAL IMPORTANCE

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Abstract

India's higher-education system has expanded dramatically since Independence, yet enrolment gains remain modest and uneven. Drawing on the All India Survey of Higher Education 2021–22 and Union-State budget data, this paper interrogates the policy emphasis on Institutes of National Importance (INIs) and its repercussions for equity and national innovation. It finds that IITs, NITs and IIMs collectively absorb 18.2% of the higher-education budget while enrolling less than 0.76% of students; per-capita public expenditure on an INI student exceeds the national average by a factor of eighteen. Conversely, state universities, which host two-thirds of learners, operate under acute fiscal constraints that depress infrastructure quality, faculty strength and research output. The analysis shows that India's total R&D spend—0.64% of GDP—lags global comparators and is channelled largely to defence and space agencies, leaving universities with under 9% of funds. Historical and institutional review reveals how colonial precedents, post-independence technocracy and coalition-era provincial lobbying entrenched an elite-centric model. The paper argues that without a deliberate redistribution of central grants and ring-fenced centre-to-state transfers for public universities, India cannot achieve a higher Gross Enrolment Ratio, inclusive growth or a broad-based research ecosystem.

Foreword and Acknowledgements

Contemporary global debates on higher education often center around notions of “excellence”, “eminence”, and the ideal of the “world class university”. Yet, a closer look at the realities of higher education across different national contexts reveals a far more complex picture—one marked by institutional diversity and socio-economic disparities. This paper examines the Indian higher education system to illustrate how a narrow focus on elite institutions fails to capture the full scope and function of universities and their role in societal and economic development.

We argue that India’s “Institues of National Importance” represent only a small, and highly selective segment within a vast and diverse higher education landscape. In order to better understand the realities of this sector, we advocate for a broader analytical lens rooted in the social sciences—one that incorporates social, political, and economic dimensions. Such an approach brings into focus key issues such as social inequality, regional disparities, institutional diversity, and the role of higher education in fostering economic innovation.

The reflections presented in this paper emerged from discussions held during Karan Sharma’s research fellowship at the Forum Internationale Wissenschaft (FIW) in November and December 2024. This fellowship was supported by the SPARC project Nr. 1871 (“Public Humanities and Pedagogy in the Global South: Challenges and Directions”), funded by the Ministry of Human Resource Development, Government of India. We look back with appreciation on the collaborative work and stimulating exchanges that were made possible by this initiative.

We extend our sincere thanks to the Principal Investigators from BITS Pilani, Goa Campus—Geetha Bakilapadavu and Reena Cheruvalath. We also thank our German collaborators—Désirée Schauz, Sarah Tober, Andreas Sieß, and Julika Griem—for their valuable contributions to the SPARC project. Finally, we gratefully acknowledge Lakshmi Subramanian, whose visit to the University of Bonn in July 2018 laid the groundwork for bringing together this engaged group of scholars, united by a shared interest in the social and institutional fabric of universities in India.

1. Introduction

India's higher education system is one of the largest in the world in terms of institutional volume and enrolment. From prominent public universities to emerging private colleges, and from premier research-centric institutes to diverse vocational training centers, India's higher education landscape demonstrates both promise and complexity. Although India's broader socio-economic development strategy is inextricably linked to its higher education capacity, a significant policy critique focuses on the disproportionate emphasis placed on select institutions designated as "Institutes of National Importance" (INIs). These include the Indian Institutes of Technology (IITs), Indian Institutes of Science Education and Research (IISERs), Indian Institutes of Management (IIMs), National Institutes of Technology (NITs), Indian Institutes of Information Technology (IIITs), and others.

While these elite institutions possess high public visibility, their gross student enrolment is miniscule compared to the gross enrolment in the country despite them receiving a substantial portion of the higher education budget (Planning, Monitoring, and Statistics Bureau, 2023). Against this background, this working paper critically examines India's higher education landscape. Using the All India Survey of Higher Education, 2021–22 (AISHE) (Department of Higher Education, 2022), it explores the current structure, distribution, and enrolment patterns among universities and colleges, scrutinizes the funding imbalance toward INIs, and assesses the implications for research and development (R&D). Through this analysis, the paper discusses how the disproportionate focus on INIs may undermine more equitable access and development within the overall higher education system.

2. The Landscape of Higher Education in India

The origins of modern India's higher education system lie in its colonial past. The British East India Company and later the British government used education as a tool for cultural colonization of the subcontinent; under the East India Company, perhaps for the first time in Indian history, the state emerged as the sole producer and arbiter of knowledge (Kumar, 2022). The Calcutta Madrasa (1781), the Benaras Sanskrit College (1791), and the Fort William College (1800), were among the first institutions established by the colonial administration, reflecting an initial interest in Oriental knowledge (Datta, 2017). With the Charter Act of 1813, the British Parliament officially declared Indian education as one of the duties of the state. However, with Thomas Babington Macaulay's Minute on Education (1835), a decisive shift towards Western knowledge systems emerged, emphasizing English as the medium of instruction and sidelining indigenous educational traditions (Evans, 2002; S. C. Ghosh, 1995).

The establishment of the first three universities in Bombay, Calcutta, and Madras in 1857, modeled after the University of London, marked a significant turning point. These institutions prioritized English and the humanities, setting the tone for higher education in colonial India. Subsequent institutions like the University of Punjab (1882) and the University of Allahabad (1887) followed similar frameworks (Jayaram, 2007). Colonial education policies remained under British control until the Government of India Act 1935, which initiated the "Indianisation" of education. This phase emphasized vocational and physical education, aligning with local needs and aspirations (Sharma, 2002).

The expansion of higher education in India has been substantial over the last several decades. At the time of independence in 1947, India had 20 universities and 496 colleges, catering to 241,369 students (Jayaram, 2007). Recognizing the pivotal role of education in nation-building, the Indian government established the University Education Commission (1948) to oversee and spread the reach and accessibility of higher education in the country. In the following decades, state-funded institutions proliferated, and financial assistance was extended to private institutions, creating a system of grant-in-aid colleges.[1]

India's higher education system today operates under the oversight of the University Grants Commission (UGC), established by the University Grants Commission Act of 1956. The UGC is tasked with maintaining educational standards, advising the government on matters concerning higher education, and ensuring coordination between central and state authorities. Accreditation is managed by autonomous institutions under the UGC's purview such as the National Assessment and Accreditation Council (NAAC), an autonomous body established by the UGC in India in 1994.

Today the UGC operates through its headquarters in New Delhi and six regional offices located in Pune, Bhopal, Kolkata, Hyderabad, Guwahati, and Bangalore. The Commission comprises a Chairman, a Vice-Chairman, and other members appointed by the Central Government. These members include distinguished academicians, representatives from the government, and professionals from various fields, ensuring a diverse and comprehensive governance structure. The UGC is empowered to coordinate and determine standards in universities, allocate and disburse grants to higher education institutions, and advise both the Central and State Governments on educational policies. It establishes regulations for minimum standards of instruction, academic curricula, and examinations. Additionally, the UGC has the authority to recognize or derecognize universities and colleges based on their adherence to prescribed standards.

According to AISHE 2021–22, India currently has 1,168 universities, which can be categorized as follows: 685 government-run universities (240 centrally run and 445 under state governments), 10 private deemed (aided) universities, and 473 private unaided universities. In addition, there are 17 universities exclusively for women and 18 open universities focused on distance learning (Department of Higher Education, 2022). These figures underscore both the breadth and diversity of India's higher education sector.

Among the 1,162 universities covered in the AISHE survey (some did not submit data), 655 are general universities, 192 are technical universities, 57 specialize in agriculture and allied fields, 79 focus on medical education, 27 concentrate on law, and the rest fall into other specialized categories (see Figure 1).

[1] A *grant-in-aid* college usually refers to a privately managed but publicly subsidised institution: the state pays (mainly) the salaries, while management retains limited autonomy—an arrangement designed to widen access without bearing the full fiscal burden of government ownership.

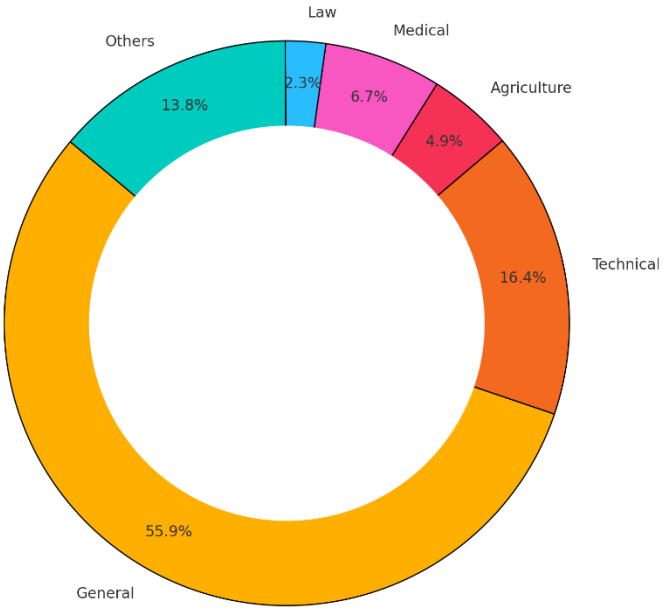

Figure 1: Distribution of University by Type. Source of data: AISHE.

The survey also registered 45,473 colleges, which provide the majority of undergraduate instruction. Of these colleges, 21.5% are government-run, 13.2% are private aided, and 65.3% are private unaided, indicating that the private sector operates the largest number of college-level institutions (see Figure 2). Notably, 10.4% of all colleges cater exclusively to female students, reflecting ongoing efforts to enhance women's participation in higher education.

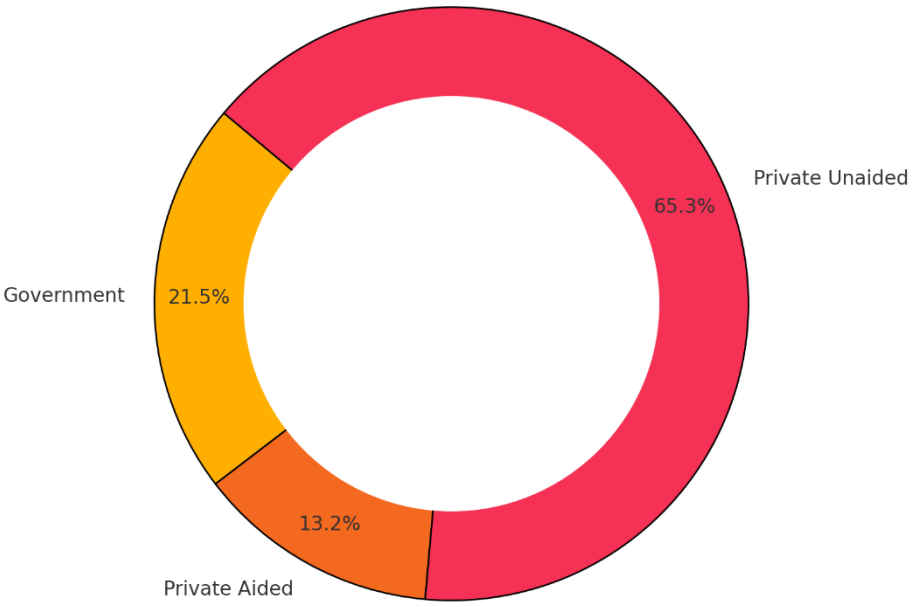

Figure 2: Distribution of Colleges by Ownership. Source of data: AISHE.

This sectoral growth has occurred in response to the demands of a large and young population. However, the distribution of institutions varies widely, leading to inequalities in access, quality, and infrastructure. Although government institutions remain the mainstay for a large proportion of students, the private sector has emerged as a parallel space that has both expanded access and introduced new challenges related to quality assurance and affordability.

3. Enrolment Trends and Demographics

Total enrolment in Indian higher education stands at 43.3 million students, of whom 20.7 million are female. Socially, 15% belong to Scheduled Castes (SC), 6.3% to Scheduled Tribes (ST), 37.8% to Other Backward Classes (OBC), and 40.6% to general or other categories (Figure 3).[2]

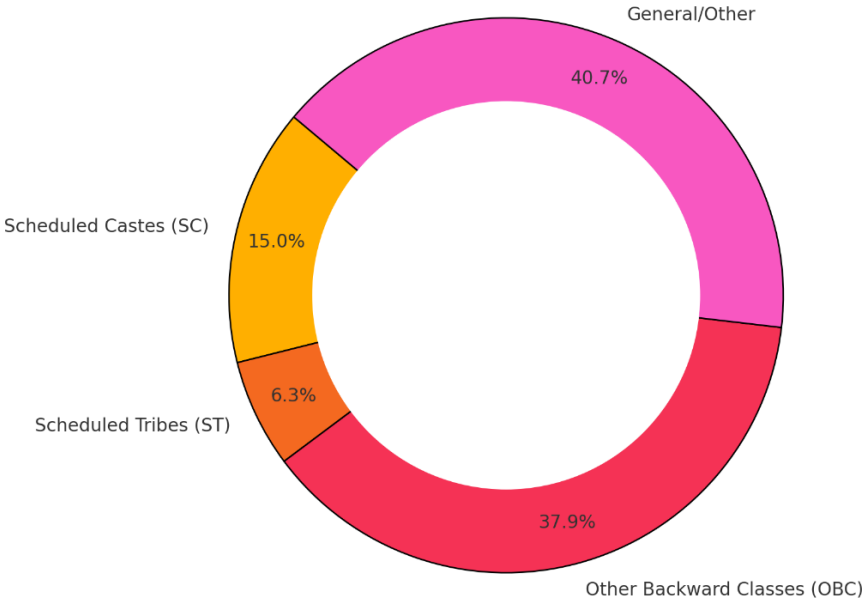

Figure 3: Social Category Distribution in Indian Higher Education. Source of data: AISHE.

[2] India's Constitution provides a system of affirmative action to correct historical exclusion of certain communities in public employment through a system of reservations in higher education, government jobs, admissions, and elected bodies. The reservation system divides the general population into four reserved categories. First, *Scheduled Castes* (SC), i.e. communities formerly subjected to social discrimination and sometimes even "untouchability." They receive 15% of central-government posts and seats. Second, Scheduled Tribes (ST), i.e. tribal groups historically outside the caste order. They hold a 7.5% quota plus reserved seats in many legislatures. Third, Other Backward Classes (OBC), assumed to be socially and educationally disadvantaged castes identified by the Mandal Commission (1980). They are allotted 27% of posts and seats, with a "creamy-layer" income cap to exclude the better-off. Fourth, General (Unreserved), a category open to all, including forward castes and any SC/ST/OBC applicants competing on merit. Since 2019 a 10% sub-quota within this pool was created to benefit economically weaker sections (EWS) within the population groups and communities not already covered by SC/ST/OBC reservations. Hence, only 40% (minority) seats are actually unreserved in Indian public universities, government jobs, and legislature and approximately 60% of the population is under the affirmative action provided for one or the other category of the Indian reservation system.

These data reflect incremental progress in representation for historically marginalized communities; however, significant efforts remain necessary to sustain and expand inclusive access to gender minorities and communities from economically backward sections and regions.

The Gross Enrolment Ratio (GER) for the 18–23 age cohort is 28.4%, an increase from earlier periods, although still low in comparison with developed nations where the GER often surpasses 60%. The female GER is 28.5%, surpassing the male GER for five successive years, which indicates progress in reducing gender disparities. Concerns remain that these figures rely on 2011 Census data—India was unable to conduct the 2021 Census due to the COVID-19 pandemic—potentially leading to inflated GER estimates.

Moreover, 78.9% of enrolled students are at the undergraduate (UG) level, while only 12.1% pursue postgraduate (PG) education. The remainder is divided among diploma courses and doctoral programs (Figure 4). At the UG level, the Arts lead with 34.2% of enrolments, followed by Science (14.8%), Commerce (13.3%), and Engineering and Technology (11.8%). At the PG level, Social Sciences register 21.1% and Science accounts for 14.7%. Overall, STEM fields at UG, PG, and PhD levels collectively enroll 9.85 million students, constituting 25.6% of total higher education enrolment. Doctoral enrolments exhibit a different pattern: 24.8% are in Engineering and Technology, and another 21.3% in Science. This distribution suggests that technical fields continue to receive considerable attention, although the total doctoral enrolment is modest relative to undergraduate enrolment.

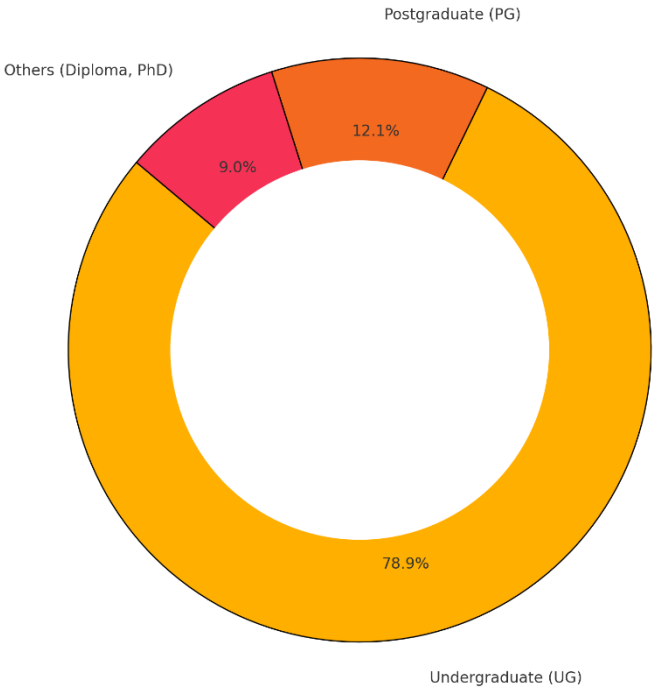

Figure 4: Distribution of Students by Education Level. Source of data: AISHE.

4. The Role of Government and Private Institutions

The split between government and private sectors in enrolment deserves closer attention. Government universities—representing 58.6% of the total number of universities—enroll 73.7% of all university students. In contrast, private universities—representing 41.4% of the total number of universities—enroll only 26.3% of students (Figure 5).

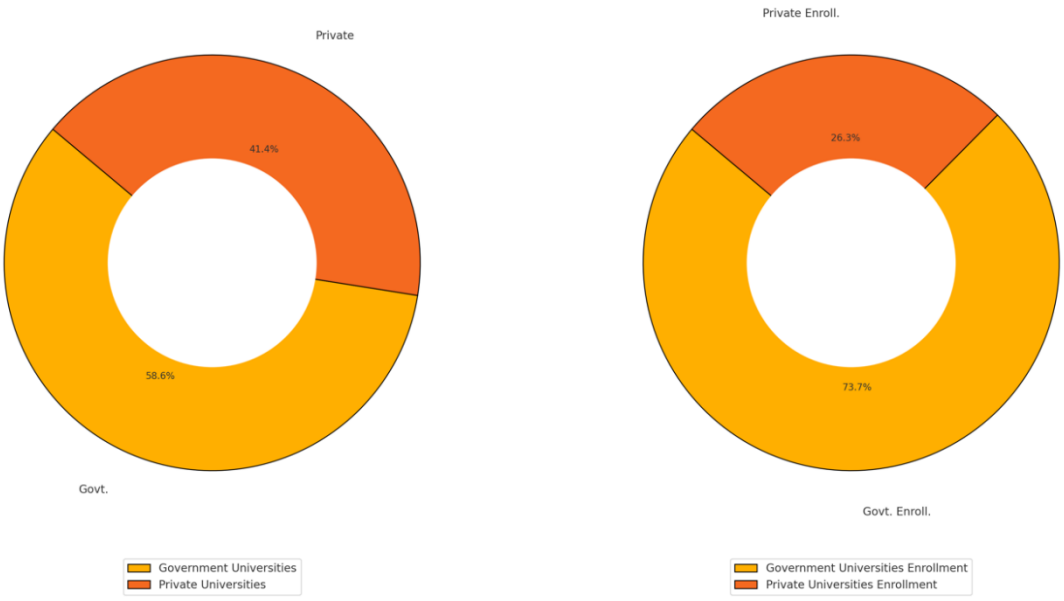

Figure 5: University Types and Enrollment Distribution (left: total number of universities, right: enrollment distribution). Source of data: AISHE.

A similar pattern is evident at the college level. Although government colleges constitute 21.5% of the total, they accommodate 34.8% of college-level enrolment. Private aided colleges (13.2%) hold 20.6% of enrolment, whereas private unaided colleges—forming 65.3% of the total—enroll 44.6% of students (Figure 6). This discrepancy reveals structural imbalances. Government and government-aided institutions often maintain higher enrolment levels due to their longstanding reputations, subsidized tuition fees, and public perception of quality. Meanwhile, private unaided colleges must compete intensely for students despite higher fees in comparison to public colleges and also varying standards of quality.

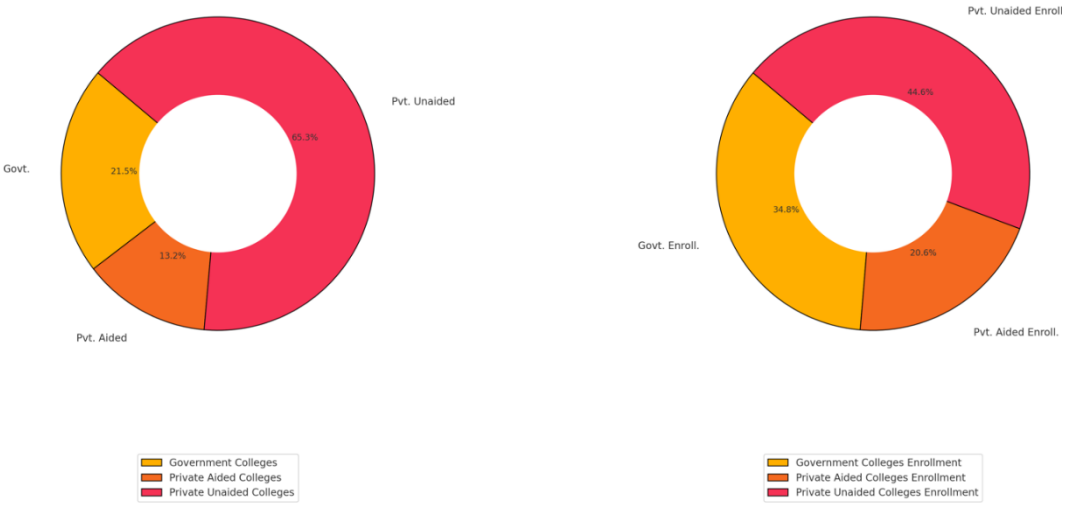

Figure 6: Total Number of Colleges and College Enrollment Distribution.
Source of data: AISHE.

5. Spatial Distribution of Colleges and Universities

The regional distribution of higher education institutions in India is characterized by significant imbalances. According to AISHE 2021–22, among districts, the capital of Karnataka, Bengaluru hosts the highest number of colleges (1,106), followed by Jaipur (703) in Rajasthan, Hyderabad in Telangana, Pune in Maharashtra, and Prayagraj in Uttar Pradesh. When measured per 100,000 inhabitants in the 18–23 age group, the national average is 30 colleges. Some states surpass this, notably Karnataka (66), Telangana (52), Andhra Pradesh (49), Himachal Pradesh (47), and Kerala (46).

In absolute terms, Uttar Pradesh leads with 8,375 colleges, followed by Maharashtra (4,692) and Karnataka (4,430) (for more information see Figure 7). High population states often struggle with educational infrastructure relative to their demographic needs, while historically progressive states have managed more robust expansion of educational institutions.

Figure 7: Top 10 States by Number of Colleges. Source of data: AISHE.

6. Institutions of National Importance

The higher education scene in India is overshadowed and also violently stereotyped by a small coterie of institutes like the Indian Institutes of Technology, widely known in the public through their abbreviations (IITs). Also, institutes like the All-India Institutes of Medical Science (AIIMS), NITs, IIITs, and lately even IIMs can be considered to belong to the same league. Currently, in 2024, according to the Ministry of Education, as per the various Acts of the Parliament of India, the country has a total of 165 Institutes of National Importance (INIs) out of which 117 are directly under the Ministry of Education, 18 under the Ministry of Health and Family Welfare and rest under different ministries and departments (see Table 1) (Department of Higher Education, 2023).[3] INIs have been conceptualized as educational but primarily research and training institutes for the development of critical technologies deemed indispensable for national development.

[3] For a more expansive view of which INIs are under which ministry, check: https://www.education.gov.in/institutions-national-importance

Table 1. Institutes of National Importance and Parent Ministries

Ministry / Department	**No. of INIs supported**
Ministry of Education	117
Ministry of Health & Family Welfare	18
Department of Pharmaceuticals, Ministry of Chemicals & Fertilizers	7
Ministry of Commerce & Industry	6
Ministry of Agriculture & Farmer's Welfare	2
Ministry of Home Affairs	2
Ministry of Culture	2
Ministry of Food Processing Industries	2
Ministry of Science & Technology	2
Ministry of Ayush[4]	1
Department of Legal Affairs	1
Ministry of Law & Justice	1
Ministry of Youth Affairs & Sports	1
Ministry of Statistics	1
Ministry of External Affairs	1
Total	165

INIs mostly include a variety of Science, Technology, and Engineering institutes but also four major Central Universities, such as Aligarh Muslim University (which has a recognized religious minority character), Banaras Hindu University, University of Allahabad, and Delhi University. These four universities (among others for some reasons not recognized as INIs) are among the oldest established modern universities in the Indian subcontinent, and they feature a diversity of humanities, social sciences, languages, commerce, law, and STEM departments. Among the recognized INIs there are also institutes of Planning and Architecture, Management, Medicine, Pharmaceuticals, Design and Textiles, Agriculture, Forensics, Petroleum, and Statistics.

Among the 117 INIs under the Ministry of Education, 23 are Indian Institutes of Technology (IITs), 25 are Indian Institutes of Information Technology (IIITs),[5] 20 are Indian Institutes of Management (IIMs), 8 are Indian Institutes of Science Education and Research (IISERs), 31 are National Institutes of Technology (NITs), 3 are School of Planning and Architecture, 4 Central Universities, and 3 other institutes (Department of Higher Education, 2023).

Among these INIs the oldest IITs are the most prestigious and premiere institutes of higher education in India. IITs were established through the Institutes of Technology Act, 1961 (The Indian Institute of Technology Act, 1961, 1961). Though, just a year before India's independence a committee was set up by Sir Jogendra Singh, Member of Viceroy's Executive Council to consider the establishment of Higher Technical Institutes for postwar industrial development in India (Sharma, 2002). The 22-member committee under the aegis of Sri N.R. Sarkar

[4] Refers to a government health department focusing on indigenous knowledge systems of wellbeing and medicine such as Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH).
[5] Of these IIITs, 5 are fully state funded and 20 are public-private partnerships.

recommended the establishment of four Higher Technical Institutions in four regions of India on the lines of the Massachusetts Institute of Technology in USA, with a number of secondary institutions and labs associated with it. The committee envisaged that these higher technical institutes not only produce undergraduates but also engage in research, training scientists and technical teachers as well. The standards of the graduates from these institutes should match the best in the West. The Sarkar committee report led to the establishment of India's first IIT in Kharagpur in 1951, today's West Bengal (Sapovadia, 2016).

IIT Kharagpur in Bengal was followed by IIT Bombay in 1958, IIT Madras and IIT Kanpur in 1959, and IIT Delhi in 1961. These five oldest IIT's still outperform and outrank later established IITs and NITs in almost all metrics of research and teaching (Choudhury et al., 2023).

The IITs captured the imagination of the Indian middle-class to such an extent that by 1990s, when coalition governments became dominant in Indian politics, each and every province began demanding establishment of an IIT within its borders. Hence, we see that after a hiatus of approximately three decades, India began to witness a proliferation of IITs (A. Ghosh, 2022). For example, IIT Guwahati was established in 1994, though its roots trace back to the 1985 Assam Accord between the Center and All Assam Students Union (Desai et al., 2014). Also, India's oldest engineering institution, the Thomason College of Civil Engineering (established in 1847) and later renamed as the University of Roorkee in 1949, transitioned into IIT Roorkee in 2001 (Ramnath, 2017). In the year 2008, six new IITs became operational in Ropar, Bhubaneshwar, Gandhinagar, Hyderabad, Jodhpur, and Patna. In 2009 two more came into existence in Indore and Mandi.

Much on the lines of the IIT Roorkee, the Banaras Engineering College established in 1919 which later in 1968 became the Institute of Technology of the Banaras Hindu University transitioned into IIT Banaras Hindu University in 2012 (Choudhury et al., 2023). Similarly, the Indian School of Mines and Applied Geology at Dhanbad, established on the lines of the Royal School of Mines in London in 1926 was transformed into an IIT in 2016. Hence, we can see that although most IITs are new universities, some of them have been long established premier institutes of engineering which were lately transitioned or been rechristened as IITs. Observably, the state has not only established new INIs from scratch but also has absorbed legacy premier institutes within the fold of INIs like the IITs.

Similar to IITs are NITs, which are relatively more accessible and have a stronger focus on industry. Similarly, IIITs are more oriented towards information technology related fields over and above other branches of technology and engineering training.

7. Institutes of Eminence

Apart from INIs the University Grants Commission awards a recognition status of "Institutes of Eminence" (IoEs) for institutes which are among the best of the best in the country. The UGC in its "Declaration of Government Educational Institutions as Institutions of Eminence" Guidelines 2017 states that there was felt a need to provide an enabling regulatory architecture for ten public and ten private institutions to emerge as world-class teaching and research institutions (University Grants Commission, 2017). These institutions are provided more autonomy both administratively (in terms of setting fees) and academically, with regards to courses, degrees, and programs, and incentives for international cooperation, including permissions for offshore campuses (Chattopadhyay, 2022). Public institutions in the list are granted with a monetary support of approximately Rs 1,000 crores or 170 million USD,[6] however such support is not extended to private universities (Pandita & Singh, 2021). As of 2022

[6] In the Indian number system, lakh and crore replace million and billion. 100,000 = 1 lakh, 1 million = 10 Lakh, 10 million = 1 crore, 1 billion = 100 crore.

the Ministry of Education has bestowed the title to 8 public and 4 private universities: IISC Bangalore, IIT Delhi, IIT Bombay, IIT Madras, IIT Kharagpur, University of Delhi, Banaras Hindu University, and the University of Hyderabad are eight Public IoEs and BITS-Pilani, Manipal Academy of Higher Education, OP Jindal Global University, and Shiv Nadar University have been declared Private IoEs.

8. Funding Disparities

According to the report on the analysis of budgeted expenditure on higher education budget in India for the year 2021–22, it amounted to ₹76,980 crore (8.92 billion USD), comprising ₹55,912 crore (6.48 billion USD) for University & Higher Education and ₹14,640 (1.69 billion USD) crore for Technical Education.[7] This sector accounted for 11.93% of the total education budget of the country (See Figure. 8).

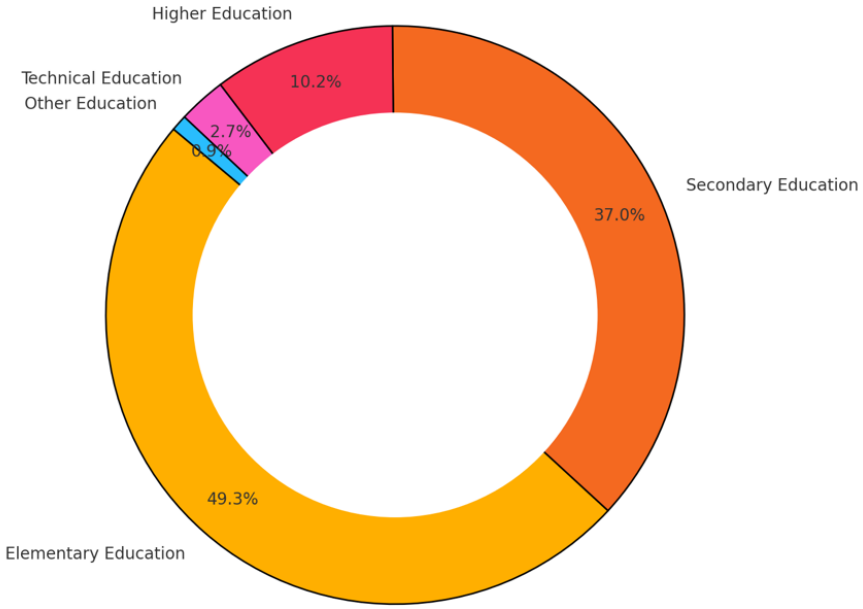

Figure 8: Share of Higher Education Budget in Total Education Budget. Source of data: Planning, Monitoring, and Statistics Bureau report, Department of Higher Education.

In terms of funding distribution, the total budgeted expenditure on education across all levels in 2021–22 was ₹6,45,333 crore (74.85 billion USD). The Central government contributed ₹93,219 crore (10.8 billion USD), accounting for 14.5% of the total, while the States and Union Territories collectively contributed ₹5,52,114 crore (64.04 billion USD), making up 85.6% of the budget (Planning, Monitoring, and Statistics Bureau, 2023).

However, these figures do not represent the full scale of expenditure on education in India; several other ministries, including Agriculture & Farmers Welfare, Civil Aviation, Commerce and Industry, Environment, External Affairs, Finance, Road Transport & Highways, and Science & Technology, also play a role in supporting university and technical education programs. They fund specialized universities, schools, libraries and other research institutes,

[7] This calculation was made using the conversion rates on 24 April 2025 when 1,000 crore INR amounted to 116 million USD. Conversion of most if not each and every figure in USD has been provided.

laboratories, and establishments. Expenditure on education coming from outside the different ministries of education at the central and state levels is ₹ 3,01,640 crores (34.99 billion USD), which forms 31.8% of the expenditure on education in India. The total consolidated expenditure on education in India, including expenditure of other departments goes up to ₹9,46,973 crores (109 billion USD), which does not include private investment in education. It is interesting to note that this figure vastly surpasses India's current defense budget which is the biggest beneficiary in the national budget.[8]

An examination of India's higher education budget allocations reveals the depth of the policy emphasis on INIs. The total budgeted expenditure for Institutes of National Importance (such as IITs, NITs, IIMs, and other premier institutes) in 2021–22 was significant. The Indian Institutes of Technology (IITs) collectively received ₹7,486 crores as total income, with total expenditure amounting to ₹8,153 crores. The National Institutes of Technology (NITs) had a total income of ₹4,031 crores and a total expenditure of ₹4,284 crores. The Indian Institutes of Management (IIMs) collectively received ₹2,446 crores as total income, with an expenditure of ₹1,594 crores (See Figure 9).

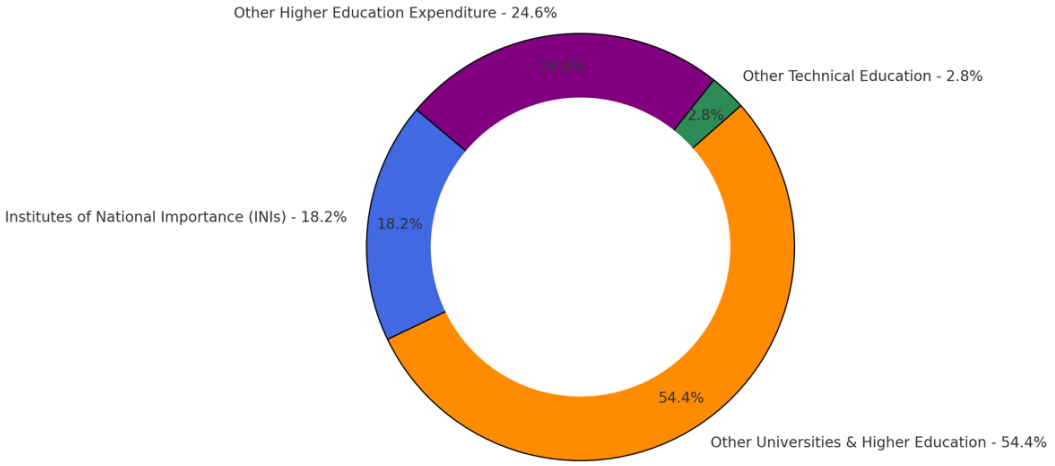

Figure 9: Higher Education Budget Distribution for 2021-22. Source *of data*: Planning Monitoring and Statistics Bureau, Department of Higher Education.

Adding up these expenditures, the total investment in Institutes of National Importance in 2021–22 was ₹14,032 crores (1.62 billion USD). This accounts for 18.2% of the total Higher Education Budget (₹76,980 crores), including both central and state expenditure in higher education. This highlights the Indian government's emphasis on funding premier institutions; the data indicates that IITs, NITs, and IIMs collectively secure more than 66.7% of the total expenditure on universities and higher education by the central government (21,068 crores), even though these institutes enroll less than 0.76% of the country's higher education students.

The picture becomes clearer when we consider national expenditure on higher education at a per-capita level. The national average per-capita expenditure on higher education by the government of India is 24,130 rupees (approx. 280 USD). In INIs this figure goes up to 4.40 lakh rupees (approx. 5,100 USD).[9] However, India's per-capita expenditure on its premiere

[8] This holds even after taking into account that these figures are from 2020; moreover, current consolidated education expenditure might be beyond 120 billion USD, looking at the continuous growth in government revenues in the last four years.

[9] Per-capita calculation has been made through the division of relevant budget allocation with the total number of enrolled students in government colleges and universities.

institutes is still way below the average per-capita expenditure on higher education in countries like Germany, which stands at nearly 14,000 USD.[10]

Nevertheless, critics contend that within the Indian context this funding approach is inequitable and unsustainable. India's overall GER stands at 28.4%, indicating that a large proportion of potential students remain outside the higher education system. High levels of funding directed to a relatively small number of students reinforce existing inequalities, as the remaining government and state universities operate under financial constraints that hinder their development. Many of these institutions lack the resources to upgrade infrastructure, adopt digital technologies, or attract and retain qualified faculty.

Furthermore, overreliance on elite institutions for the nation's technological and scientific progress may undermine capacity building in the broader university ecosystem. A robust undergraduate education is fundamental to fostering critical thinking and early research skills. Excessive concentration of funds in a few institutions may thus impair India's ability to cultivate a wide base of research-oriented graduates, especially in fields beyond engineering and technology.

9. R&D Investment: The Myth and Reality

India's research and development (R&D) ecosystem faces structural challenges that hinder its ability to compete globally. The broader national R&D framework remains underfunded and overly centralized. A primary concern is the country's relatively low R&D expenditure. In 2020–21, India allocated only 0.64% of its GDP to R&D, a figure that has declined from 0.82% in 2009–10 (Department of Science and Technology, 2023). This level of investment is significantly lower than that of major economies, including South Korea (4.8%), the United States (3.5%), Japan (3.3%), Germany (3.1%), France (2.3%), and China (2.4%). Most developed nations invest at least 2% of their GDP in R&D, ensuring sustained innovation and technological advancement. India's stagnation in this regard places it at a distinct disadvantage in global research competitiveness.

In addition to low overall expenditure, India's R&D investments are highly concentrated in a few specialized government agencies, such as the Defence Research and Development Organisation (DRDO) and the Indian Space Research Organisation (ISRO). These agencies receive a disproportionate share of the national R&D budget, with DRDO alone accounting for 30.7% of central government R&D spending in 2020–21, followed by ISRO at 18.4%. Other major recipients include the Indian Council of Agricultural Research (ICAR) at 12.4% and the Department of Atomic Energy (DAE) at 11.4% (Department of Science and Technology, 2023). While these organizations contribute significantly to national security, space exploration, and industrial applications, their dominance in funding allocations leaves limited resources for universities and other research institutions. In 2020–21, the higher education sector accounted for only 8.8% of total R&D expenditure. In contrast, universities receive 19% of national R&D allocations in Germany, 20% in France, and 39% in Canada.

While extramural R&D funding—financial support allocated to external research projects—has increased from ₹2,454.02 crore in 2016–17 to ₹2,529.42 crore in 2019–20, the distribution remains insufficient. The Department of Science and Technology (DST) and the Department of Biotechnology (DBT) are the primary contributors to extramural research funding, accounting for 55% and 13%, respectively. However, without substantial increases in direct university funding, Indian institutions remain at a structural disadvantage compared to their global counterparts.

[10] Calculating these per-capita amounts through incorporating purchasing power parity of INR and Euro might indicate a totally different picture.

The private sector's limited engagement in R&D further restricts India's research capacity. In most advanced economies, business enterprises contribute more than 50%—and in some cases, over 70%—of total R&D spending. In India, however, the private sector accounted for only 36.4% of total R&D expenditure in 2020–21 (Department of Science and Technology, 2023), a figure that has remained relatively unchanged over the past five years. Overall corporate investment in R&D remains insufficient to drive large-scale technological advancement.

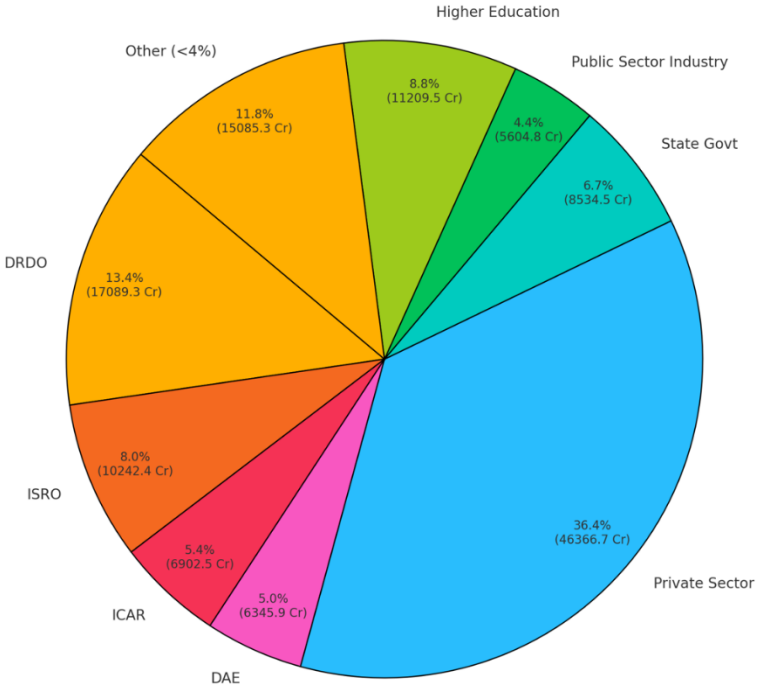

Figure 10: Sector-wise Distribution of India's R&D Expenditure (2020-21).
Source of data: DST.

The assumption that prioritizing funding for INIs will place India at the forefront of global research is, therefore, only partially valid. Even well-funded institutions operate within an underfunded university system that lacks the financial and infrastructural resources necessary to compete internationally. A robust research ecosystem requires broad participation from universities, sustained financial support, and strong industry-academia collaboration. Insufficient investment in state and public universities further limits the country's ability to cultivate a wide base of researchers and scientific innovators, reinforcing the concentration of research activity within a select few institutions.

Despite these constraints, India has demonstrated significant progress in scientific research output. Between 2010 and 2020, the country's research publications increased from 60,555 to 149,213, representing a growth rate of 9.4%, more than double the global average of 4.3%. India now ranks third globally in scientific publication output, surpassing several advanced economies (Department of Science and Technology, 2023). However, its performance in patents and innovation-driven research remains weak. In 2021–22, India filed 66,440 patents, yet only 44% of these were from Indian residents, indicating a reliance on foreign innovation. In comparison, leading economies such as China and the United States see significantly higher levels of patent filings by domestic entities, reflecting stronger intellectual property generation within their national research ecosystems.

The structural deficiencies in India's R&D framework necessitate urgent policy interventions. Increasing national R&D expenditure to at least 2% of GDP is essential to enhance competitiveness with leading research economies. Expanding university participation in R&D funding and ensuring greater allocation of financial resources to higher education institutions will help develop a more diverse and interdisciplinary research landscape. Encouraging private-sector investment in R&D, particularly in high-technology fields, is critical for sustaining long-term innovation and economic growth. Strengthening state and public universities, which remain chronically underfunded, is equally imperative to ensure a more inclusive and decentralized research ecosystem.

10. Conclusion

From the early universities modeled on the University of London to the establishment of premier institutions post-independence, the Indian higher education sector has undergone substantial expansion. However, despite numerical growth, disparities persist in terms of institutional quality, regional distribution, and financial accessibility.

Empirical data from the All India Survey of Higher Education (AISHE) 2021–22 highlights the stark imbalance in enrolment across different institutional categories. While government universities enroll the majority of students, private institutions, particularly unaided colleges, dominate the landscape numerically. The Gross Enrolment Ratio (GER) of 28.4, though improving, remains significantly lower than in developed nations, reflecting systemic barriers to higher education access.

A key issue is the Indian government's historical and continuous overemphasis on INIs, which, despite their prestige, serve a minuscule fraction of India's student population. The consequent financial asymmetry is striking, with INIs collectively receiving approximately 18.2% of the higher education budget while enrolling less than 0.76% of the college and university-going students in India. This over-concentration of resources in elite institutions exacerbates inequalities, as state universities and colleges struggle with inadequate infrastructure, faculty shortages, and limited research funding. While INIs contribute to India's global academic standing, their dominance in policy and funding discourse sidelines broader systemic reforms necessary for higher education expansion.

Further, the much-touted research and development (R&D) contributions of INIs need to be contextualized within India's overall R&D ecosystem. Despite the high allocations to INIs, India's R&D investment remains at a meager 0.64% of GDP, significantly trailing global leaders. Moreover, only 9% of India's R&D expenditure is directed towards universities, underscoring the limited role of higher education institutions in national innovation frameworks. The argument that prioritizing INIs will lead to a robust research ecosystem is, therefore, only partially valid and neglects the need for a more expansive, interdisciplinary, and decentralized research funding approach which affectively involves universities as the origin and facilitators of R&D instead of specialized government departments.

India's higher education policy must recalibrate its priorities to ensure a more equitable and sustainable system. An inclusive strategy must focus on strengthening state universities, expanding research capacities beyond premier institutions, and addressing regional disparities. A more balanced distribution of financial resources, alongside policy initiatives to enhance institutional autonomy, faculty recruitment, and interdisciplinary research, is essential. Without such reforms, the current trajectory risks deepening existing inequalities and sabotaging the broader developmental objectives of India's higher education system. Essentially, there is a need for comprehensive expansion of public investment in education, focusing on multi-departmental grand universities with high enrollment capacity, over and above the development of INIs and IoEs.

It is important to note that this expansion is not possible without the involvement of state governments, which currently bear two-thirds of the national higher education budget. Current trends indicate that the departments of higher education across the different states of India are running a diversity of institutes and universities that are underfunded, whereas the higher education department (under Ministry of Education) of the central government has narrowed its focus solely on INIs over the last decades. Therefore, institutes which can actually improve the GER of India and also provide accessible and quality education to the masses are mostly at the mercy of different state governments with their limited budgets and INIs have become the sole focus of the central government. This "excellence over massification" policy has thus produced a situation where the state is spending over 5,000 USD per-capita annually for students in IITs and NITS whereas students in other state and non-INI central universities receive below 300 USD per capita. Thus, to enhance the enrollment capacity of state universities and existing non-INI central universities and to provide accessible quality education to the masses, the only valid and necessary measures appear to be a substantial increase in the central higher education budget aimed at redevelopment and expansion of non-INI central universities and the provision of dedicated center-to-state fund transfers exclusively for the development of state universities.

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