

Geography as an Undergraduate Discipline in India: Trends, Challenges and Future Prospects

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Abstract

Geography occupies a distinctive position in Indian higher education because it connects the physical sciences, social sciences, environmental studies and rapidly expanding geospatial technologies. Yet its undergraduate status remains marked by a paradox: the societal relevance of geographical knowledge is increasing at the same time as longstanding concerns persist regarding disciplinary identity, curriculum modernisation, teaching quality, infrastructure and graduate employability. This paper examines the changing position of undergraduate geography in India and evaluates its future prospects in the context of higher-education expansion, the National Education Policy (NEP) 2020 and the emerging geospatial economy. The study adopts a descriptive, analytical and comparative secondary-data design. Evidence is drawn primarily from the All India Survey on Higher Education (AISHE) 2023–24, University Grants Commission frameworks, NEP 2020, national geospatial policy documents, selected university curricula and peer-reviewed scholarship on geography education. The analysis shows that India's higher-education system has expanded substantially and curricular reform is creating opportunities for interdisciplinary, flexible and skill-oriented geography programmes. Simultaneously, the discipline faces uneven curricular modernisation, limited comparability of undergraduate geography statistics, variable access to laboratories and geospatial facilities, fragmentation between physical and human geography, and the risk of reducing GIS education to software training. The paper argues that geography's future does not depend on becoming solely technical or vocational. Its strongest prospect lies in integrating critical spatial thinking, field-based inquiry, human–environment analysis, quantitative and qualitative methods, GIS and remote sensing, sustainability and locally grounded research. Such integration can reposition undergraduate geography as an intellectually coherent and professionally relevant discipline in India.

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Geography education, undergraduate geography, higher education in India, GIS, spatial thinking, NEP 2020, geospatial education, curriculum reform

1. Introduction

Geography has an unusual disciplinary location within higher education. It investigates physical processes such as landforms, climate, water, soils and ecosystems while simultaneously examining population, settlements, economic activity, cultural landscapes, political territories, development and human–environment relationships. Its organising concepts—space, place, scale, location, region, landscape, environment and spatial interaction—allow problems to be investigated across boundaries that conventionally separate the natural and social sciences. This intellectual hybridity has historically been both an advantage and a source of disciplinary uncertainty. Singh (2018), for example, stresses geography’s capacity to link human and earthly processes and to interpret sustainability through space, time and scale.

The issue is particularly important in India. Geography has been present in Indian college curricula for approximately a century, yet debates over its disciplinary confidence, institutional position and intellectual coherence remain active. Kapur (2004) characterised Indian geography as a “languishing” social science, while Lahiri-Dutt (2005) drew attention to its marginal position within the social sciences. Almost two decades later, Roy and Maringanti (2024) observed that disciplinary anxieties persisted and linked them partly to weaknesses in integrating geography’s subfields. These assessments should not be interpreted as evidence that geography lacks relevance. Rather, they point to a mismatch between the discipline’s potential contributions and the institutional, curricular and intellectual structures through which it is frequently taught.

That mismatch has become more consequential because India’s higher-education landscape is itself changing rapidly. The final AISHE 2023–24 report records approximately 4.50 crore students in higher education and shows substantial growth in universities and colleges over the preceding decade. Registered universities increased from 1,043 in 2019–20 to 1,289 in 2023–24, while registered colleges increased from 42,343 to 48,246. Female enrolment reached approximately 2.24 crore in 2023–24. These changes provide a larger institutional and demographic setting within which subjects such as geography can expand, diversify and redefine their functions.

At the policy level, NEP 2020 represents an additional turning point. It advocates multidisciplinary higher education, flexible curricular combinations, internships, multiple entry and exit pathways, research opportunities and three- or four-year undergraduate structures. The UGC’s Curriculum and Credit Framework for Undergraduate Programmes (CCFUP), issued in December 2022, translates these principles into a more flexible credit-based undergraduate framework. For geography, these reforms create possibilities for combinations with

environmental science, economics, geology, sociology, statistics, computer science, disaster management, urban studies and data science rather than preserving rigid disciplinary compartments.

A second transformation arises from the expanding importance of geospatial information. Geographic information systems (GIS), remote sensing, global navigation satellite systems, digital cartography, spatial databases, web mapping and Earth-observation data increasingly contribute to urban planning, agriculture, infrastructure, environmental monitoring, disaster management, logistics and natural-resource governance. India's 2021 liberalised geospatial guidelines and National Geospatial Policy 2022 give geospatial data and technologies a prominent role in national development. Geography therefore possesses an increasingly valuable technical dimension, but technological relevance does not automatically translate into good geography education. Bearman et al. (2016) caution that GIS courses can become narrowly software-oriented unless they develop the capacity to question spatial data, assumptions, analytical methods, scale and uncertainty.

This produces the central research problem addressed here. Undergraduate geography in India operates amid three simultaneous processes: rapid expansion of higher education, policy-driven restructuring of undergraduate curricula, and increasing demand for spatial and environmental knowledge. Yet there is no equally clear national picture of how successfully undergraduate geography has responded. AISHE provides extensive higher-education statistics but its principal undergraduate discipline tables aggregate students into broad categories such as Arts, Science, Social Science and Engineering and Technology. Geography is therefore not separately identifiable as a consistent national undergraduate enrolment category. This data limitation itself represents an important gap in the evidence base.

The paper consequently pursues four objectives: first, to examine the changing higher-education and policy context within which undergraduate geography is developing in India; second, to analyse major curricular, pedagogical, technological and institutional trends affecting the discipline; third, to identify persistent constraints involving disciplinary identity, infrastructure, skills and employability; and fourth, to assess strategies through which geography can become more intellectually coherent, inclusive and professionally relevant. Correspondingly, it asks: How is India's changing higher-education environment influencing undergraduate geography? How far is geography moving from primarily descriptive content towards analytical, field-based and geospatial learning? What are the principal institutional and pedagogical constraints on this transition? And what model of undergraduate geography is most appropriate for India's future academic and societal requirements?

The central argument is that the future of Indian undergraduate geography should not be framed as a choice between traditional geography and geospatial technology, between physical and human geography, or between academic and employment-oriented education. Its comparative

advantage lies precisely in integrating these domains through spatial thinking and human–environment analysis.

2. Literature Review

Debates about geography education in India have frequently revolved around disciplinary status. Kapur's (2004) assessment of geography as a languishing social science drew attention to its institutional weaknesses and limited intellectual influence relative to its potential. Lahiri-Dutt (2005) similarly questioned geography's marginality within Indian social science. These interventions were important because they shifted attention from simply expanding departments or syllabi towards examining the intellectual identity of the discipline itself. More recently, Roy and Maringanti (2024) argued that geography in India continued to display disciplinary anxiety nearly a century after its introduction into college curricula and suggested that inadequate integration among its subdisciplines is part of the problem.

Curriculum has consequently emerged as a central theme in the Indian literature. Alam (2014) directly examined undergraduate geography curricula and argued that curriculum modernisation could respond to problems of student interest, disciplinary relevance and teaching quality. He emphasised that curriculum development must remain continuous because changes in nature, society, politics, methods and technology repeatedly redefine the questions geographers need to address. Importantly, Alam also recognised that simply inserting new topics is insufficient: sequencing, staff competence, infrastructure and the academic preparation of students affect whether curricular innovation succeeds.

The school–university relationship also matters. Alam (2010) showed that Indian school geography had experienced competing approaches concerning whether geography should be taught independently or as part of integrated social studies and how local, national and world geography should be balanced. These decisions influence the conceptual foundations with which students enter undergraduate programmes. Pandey (2011), examining GIS in geography education, highlighted the analytical possibilities of GIS but also stressed the importance of adequate training and institutional visibility. Her discussion is historically useful because it demonstrates that the call for stronger GIS integration substantially predates the present geospatial-policy environment.

International scholarship helps distinguish technological adoption from genuine disciplinary learning. Bearman et al. (2016) argue that critical spatial thinking requires more than command of GIS software. Students need to understand the implications of scale, spatial data quality, uncertainty, analytical processing and the interpretation and communication of spatial outputs. If teaching concentrates mainly on executing software procedures, graduates may become technically competent operators without developing the spatial reasoning that gives geography its intellectual contribution. Their analysis is especially relevant in India as geospatial skills gain greater employment visibility.

This concern complements a broader debate about vocationalism in geography. Employability is a legitimate outcome of undergraduate education, but a curriculum designed solely around currently popular software can age rapidly. Technologies, interfaces and commercial platforms change; conceptual capacities such as spatial reasoning, field observation, statistical interpretation, critical reading of maps, research design and understanding human–environment interaction are more durable. A balanced curriculum therefore needs to make technical competence a vehicle for geographical reasoning rather than an alternative to it.

Another strand of scholarship emphasises geography’s contribution to sustainability. Singh (2018) argues that geographical education is well positioned to analyse sustainable development because space, time and scale allow environmental processes and human decisions to be examined together. This function has become increasingly relevant as undergraduate education engages with climate change, biodiversity loss, disaster vulnerability, land-use transformation, water insecurity, migration, urban expansion and regional inequality.

Internationalisation provides another dimension. Solem and Balachandran (2014) examined geography education with a specific focus on India and placed Indian geography within broader debates concerning international exchange and disciplinary development. International engagement is useful, but curriculum reform cannot simply reproduce programmes designed for North American or European institutional settings. Indian undergraduate geography must also address monsoon variability, Himalayan and coastal hazards, groundwater stress, agrarian change, metropolitanisation, informal urbanisation, demographic diversity, regional disparities and local environmental conflicts. In other words, international disciplinary standards and locally meaningful geographical inquiry are complementary rather than competing objectives.

The literature therefore identifies many of the relevant problems—disciplinary marginality, curriculum renewal, GIS, sustainability, student preparation and internationalisation—but much of the influential Indian discussion predates NEP 2020 and the National Geospatial Policy 2022. At the same time, contemporary policy documents generally discuss higher education or geospatial development as a whole rather than the institutional future of undergraduate geography specifically. The present study addresses this intersection by connecting disciplinary scholarship with current higher-education statistics, NEP implementation, representative curriculum changes and national geospatial policy.

3. Research Methodology

The research adopts a descriptive, analytical and comparative secondary-data design. No questionnaire, interview, survey sample or field-based primary dataset has been created for the study. This is particularly important because the objective is to evaluate national trends and structural conditions rather than claim student- or faculty-level attitudes unsupported by primary evidence.

The principal quantitative source is the final **All India Survey on Higher Education 2023–24**, released by the Ministry of Education in July 2026. AISHE is the most comprehensive official source available for the structure, enrolment and institutional characteristics of Indian higher education. The analysis uses indicators concerning total and undergraduate enrolment, institutional growth, broad undergraduate disciplinary distribution, selected infrastructure and implementation of NEP-related reforms. AISHE data are institution-reported: higher education institutions upload information and institutional nodal officers bear responsibility for its accuracy, while the Statistics Bureau undertakes validation and compilation. This reporting structure is recognised as a methodological limitation rather than treating every AISHE value as an independently audited census measure.

Policy analysis uses NEP 2020, UGC’s Learning Outcomes-based Curriculum Framework-related materials, the Curriculum and Credit Framework for Undergraduate Programmes, the 2021 geospatial guidelines and National Geospatial Policy 2022. Selected current university curricula, including programmes at the University of Delhi and Jamia Millia Islamia, are examined as illustrative evidence of curricular direction. They are not treated as a statistically representative national sample.

Peer-reviewed and academically recognised publications are used to interpret the historical and conceptual development of geography education. The analytical framework is organised around four connected dimensions: **disciplinary coherence**, referring to integration across physical, human and technical geography; **spatial capability**, referring to conceptual and critical spatial reasoning; **curricular responsiveness**, referring to adjustment to contemporary environmental, social and technological problems; and **institutional capacity**, referring to the personnel, infrastructure and organisational conditions required to deliver the curriculum.

An important limitation concerns national subject-specific data. AISHE defines a discipline as a branch of knowledge—for example, Geography within an M.A. programme—but its main undergraduate tables report broad discipline groups. Consequently, the study does **not** estimate a national undergraduate Geography enrolment total, growth rate or gender ratio from categories such as Arts, Science or Social Science. Such an estimate would combine incompatible classifications and would create a degree of statistical precision not supported by the underlying source.

4. Analysis and Discussion

4.1 Expansion of Higher Education and the Statistical Visibility of Geography

The expansion of Indian higher education constitutes the first major structural trend affecting geography. AISHE 2023–24 estimates total enrolment at approximately 4.50 crore. The estimated undergraduate population increased from about 3.06 crore in 2019–20 to approximately 3.46 crore in 2023–24, although the 2023–24 total was slightly below the

preceding year. Over the same broad period, the number of registered universities and colleges expanded substantially.

Indicator	Earlier reference	AISHE 2023–24 position	Interpretation
Total higher-education enrolment	~3.85 crore, 2019–20	~4.50 crore	Larger potential undergraduate base
Undergraduate enrolment	30.65 million, 2019–20	34.58 million	Continued predominance of UG education
Registered universities	1,043, 2019–20	1,289	Expanded institutional system
Registered colleges	42,343, 2019–20	48,246	Wider geographical reach of college education
Female enrolment	~1.89 crore, 2019–20	~2.24 crore	Increasing female participation

Source: Ministry of Education, AISHE 2023–24. Figures rounded where presented in crore.

The disciplinary distribution of undergraduate enrolment also illustrates the diversity of this system. In the AISHE 2023–24 broad classification, Arts accounted for 32.1 per cent of undergraduate enrolment, Science 13.5 per cent, Engineering and Technology 12.9 per cent, Commerce 12.0 per cent, Medical Science 6.3 per cent, Education 5.2 per cent and Social Science 3.9 per cent.

These figures, however, should **not** be interpreted as geography enrolment. Geography programmes in India may occur through B.A., B.Sc., honours, major/minor and multidisciplinary structures and may consequently be embedded in different broad categories. The absence of a consistently separated national undergraduate Geography series prevents reliable answers to seemingly simple questions such as whether UG Geography enrolment has risen or fallen nationally during the past decade.

This data deficit matters. Academic planning requires information on enrolment, gender, social composition, programme type, graduation, progression and institutional distribution at subject level. AISHE does report Geography separately in some postgraduate and doctoral tables: for actual responding institutions in 2023–24, it recorded 78,033 postgraduate Geography students—32,909 male and 45,124 female—and 2,714 doctoral Geography students. These figures confirm

a substantial advanced-level disciplinary presence but cannot be reverse-engineered into an undergraduate estimate.

A future national monitoring framework should therefore improve subject-level visibility at the undergraduate stage. Better data would allow researchers to distinguish whether Geography is expanding as a major, being absorbed into multidisciplinary programmes, losing students to environmental or geospatial degrees, or gaining enrolment because of employment-oriented GIS content.

4.2 Curricular Transformation: From Content Accumulation to Geographical Capability

A persistent criticism of traditional undergraduate geography curricula has been their tendency towards large amounts of descriptive or distributional content. Knowledge of regions, landforms, climates, resources and population remains necessary, but a curriculum dominated by factual reproduction can underdevelop explanation, analysis and independent inquiry. Alam's (2014) argument for continuous curriculum modernisation remains relevant because geographical realities and the methods used to understand them are constantly changing.

Evidence from current university curricula indicates movement towards a broader model. The University of Delhi's undergraduate Geography structure, for instance, combines Physical Geography and Human Geography with Digital Cartography in the first semester, Population Geography and Statistical Methods later in the programme, and subsequent exposure to Remote Sensing and other substantive branches. Jamia Millia Islamia's contemporary four-year Geography curriculum similarly includes remote sensing and is structured within the NEP-oriented undergraduate framework. Its remote-sensing component encompasses satellite systems, sensors and resolution, Indian and international Earth-observation systems, radar, hyperspectral data and LiDAR-related concepts.

These examples show that undergraduate geography is no longer adequately characterised as map drawing plus descriptive regional geography. Digital cartography, statistics, remote sensing and GIS are increasingly integrated into formal curricula. Nevertheless, curricular presence should not be confused with learning quality. A university may include "GIS" in a syllabus yet lack adequate laboratory hours, trained instructors, data access or pedagogical integration with substantive geographical questions.

A capability-oriented curriculum therefore needs to answer a different question from "Which topics are included?" It must ask what a graduate should be able to **do geographically**. This includes interpreting spatial distributions, recognising scale effects, relating processes occurring at different scales, constructing and evaluating maps, collecting and analysing field data, using qualitative and quantitative evidence, interpreting remotely sensed imagery, analysing spatial datasets and explaining human–environment relationships.

The shift also requires stronger conceptual sequencing. Introductory cartography should connect with GIS; basic statistics should prepare students for spatial analysis; geomorphology and climatology should lead into environmental hazards and climate applications; population and settlement geography should support migration, urban and regional analysis; and fieldwork should integrate concepts from several papers rather than operate as an isolated practical requirement. Curriculum reform is therefore as much about **relationships among courses** as about introducing additional courses.

4.3 The Geospatial Turn: Opportunity Without Technological Reductionism

Few developments have improved geography's external visibility as much as geospatial technology. India's liberalised geospatial regime and National Geospatial Policy recognise spatial information as critical to activities extending across agriculture, infrastructure development, land administration, natural resources, disaster management and broader social and economic planning.

This environment creates significant opportunities for geography graduates. Skills in GIS, remote sensing, GNSS, spatial databases, geovisualisation and geospatial analysis are relevant to planning agencies, environmental consultancies, research institutions, disaster-management organisations, utilities, logistics, location intelligence, surveying, development programmes and technology firms. Open-source software, publicly available Earth-observation products and web-based mapping have also reduced some of the financial barriers that previously confined advanced spatial analysis to specialised institutions.

Yet there is an important danger in equating the future of geography with software proficiency. Bearman et al. (2016) demonstrate why critical spatial thinking requires students to evaluate spatial data, processing decisions and outputs rather than merely follow procedural instructions. A student who can execute buffering, overlay or interpolation without understanding why a method is appropriate, what assumptions it contains, what scale effects occur, or how uncertainty influences conclusions has acquired only a partial geographical education.

The distinction is crucial for employability as well. Software interfaces change quickly, while the capacity to formulate a spatial problem, identify suitable data, select an analytical method, evaluate uncertainty and communicate a defensible conclusion remains transferable. Undergraduate programmes should therefore move from **software-centred GIS teaching** to **problem-centred geospatial education**.

For example, a practical course could ask students to evaluate urban heat exposure rather than simply perform raster operations; investigate accessibility to public services rather than merely calculate network distances; analyse land-use change instead of only executing image classification; or study flood vulnerability through the combined interpretation of terrain, settlement and social data. Such exercises simultaneously develop technical ability, research design and geographical reasoning.

Emerging developments strengthen this need. Cloud geospatial platforms, drones, volunteered geographic information, sensor networks, high-resolution satellite imagery, machine learning and artificial intelligence are changing spatial-data practice. Undergraduate geography cannot realistically teach every platform. It can, however, teach durable principles of spatial data, projections, resolution, scale, classification, error, reproducibility, ethics and interpretation. This distinction will become even more important as automated systems make technically sophisticated operations easier to perform while leaving questions of validity and interpretation to the analyst.

4.4 Fieldwork, Pedagogy, Faculty Capacity and Infrastructure

Geography's laboratory extends beyond the conventional classroom. Field observation, surveying, landscape interpretation, household or settlement studies, environmental measurement, mapping and direct engagement with places enable students to connect abstract concepts with geographical processes. Fieldwork can therefore provide a unifying pedagogical space in which physical, human, quantitative and qualitative geography interact.

However, fieldwork quality varies substantially. A field excursion that consists mainly of visiting places and reproducing a predetermined report develops fewer research skills than one in which students formulate questions, design observations, collect ethically appropriate data, map features, analyse evidence and defend an interpretation. The objective should increasingly be inquiry-based field learning rather than fieldwork as a procedural requirement.

The same principle applies to laboratories. AISHE 2023–24 reports that large proportions of responding universities, colleges and standalone institutions possess laboratory and computer-centre facilities. Approximately 89 per cent of responding universities and 85 per cent of colleges reported laboratories, while computer centres were reported by 94 per cent of universities and 89 per cent of colleges. These system-wide indicators are encouraging but they do **not** demonstrate that Geography departments possess functional GIS laboratories, licensed or open-source software, sufficiently capable computers, surveying equipment, high-speed connectivity or trained technical support.

This distinction prevents a common analytical error: general institutional infrastructure cannot be treated as subject-specific infrastructure. Geography's needs vary from those of a generic computer laboratory. Spatial datasets may be large, remote-sensing exercises can be computationally demanding, field instruments require maintenance and practical teaching benefits from low student-to-workstation ratios.

Faculty development is equally important. Technological change can produce a curriculum–capacity gap when universities add GIS, remote sensing, programming or advanced quantitative methods faster than teachers receive training to teach them. Pandey (2011) identified training and visibility as barriers to GIS education more than a decade ago. Although access to software and

digital data has improved considerably since then, professional development remains necessary because technologies and analytical practices have continued to evolve.

Pedagogical reform should consequently include continuing faculty training, sharing of open educational resources, interdepartmental laboratory use and collaborations with planning, environmental science, computer science and Earth-science departments. Open-source tools such as QGIS can reduce licensing barriers, but software cost is only one component; curriculum design, faculty competence and problem-based teaching remain decisive.

Language and background differences must also be recognised. Students enter undergraduate programmes from varied school boards, rural and urban settings, Hindi- and regional-language backgrounds, and Arts or Science streams. A technically ambitious curriculum that assumes uniform prior preparation can reproduce inequality. Foundation modules in cartographic literacy, mathematics, statistics, computing and academic geographical writing can help bridge these differences without lowering disciplinary expectations.

4.5 NEP 2020 and the Move towards Multidisciplinary Undergraduate Geography

NEP 2020 potentially aligns unusually well with geography's intellectual structure. Its emphasis on multidisciplinary learning makes sense for a subject already positioned between natural science, social science and technology. Flexible programmes can allow a Geography major to take meaningful minors or electives in economics, geology, environmental science, statistics, computer science, sociology, public policy or disaster management. Conversely, students from other disciplines can take Geography courses in GIS, environmental change, urban studies or regional development.

The four-year undergraduate structure also creates possibilities for research-intensive Geography degrees. Students can move beyond examination-oriented coursework towards supervised research involving local spatial datasets, field investigation, Earth observation or community-based geographical problems. Internships may connect students with planning bodies, GIS organisations, local governments, research institutes, environmental agencies and development organisations.

Yet AISHE 2023–24 indicates that implementation remains incomplete. Among responding universities, 58 per cent reported adoption of the National Curriculum and Credit Framework for undergraduate programmes, 56 per cent reported introduction of four-year undergraduate programmes, 69 per cent reported adoption of the Academic Bank of Credits, 49 per cent reported implementation of multiple entry and exit, 45 per cent reported multidisciplinary degree programmes and 41 per cent reported internship cells.

Selected NEP-related measure reported
by responding universities

AISHE 2023–24

Selected NEP-related measure reported
by responding universities

AISHE 2023–24

National Curriculum and Credit Framework adopted	58%
Four-year undergraduate programme introduced	56%
Academic Bank of Credits adopted	69%
Multiple entry/exit implemented	49%
Multidisciplinary degree programmes introduced	45%
Internship cell established	41%
Research and Development Cell established	65%

Source: AISHE 2023–24. Percentages refer to responding universities and should not be interpreted as measures specific to Geography departments.

The figures reveal transition rather than uniform reform. This is significant for geography because formal policy flexibility does not automatically produce intellectually coherent multidisciplinary education. Poorly designed flexibility could fragment geographical learning if students accumulate disconnected credits without developing a disciplinary core.

A successful four-year Geography programme therefore requires a clearly defined progression. Foundational courses should establish physical and human geography, maps and spatial concepts; intermediate stages should deepen thematic knowledge and methods; later stages should develop specialised analytical, geospatial and research competence; and a research pathway should culminate in a substantial project where appropriate. Multidisciplinarity works best when students possess enough disciplinary grounding to connect external knowledge meaningfully to geographical questions.

4.6 Disciplinary Identity, Employability and the Future Undergraduate Model

The oldest challenge identified in Indian geographical scholarship—disciplinary identity—cannot be solved merely by renaming courses or purchasing GIS software. Kapur (2004), Lahiri-Dutt (2005) and Roy and Maringanti (2024), despite writing in different periods, share an underlying concern with geography's ability to establish intellectual confidence and demonstrate what distinctive contribution geographical analysis makes.

The answer lies neither in retreating into classical descriptive geography nor in transforming departments into narrow geospatial training centres. Geography's distinctive contribution comes from asking spatially structured questions about relationships among environment, society and

place. GIS strengthens this capacity but does not replace it. Climate science, economics, sociology, geology, data science and planning overlap with geography, but geography's value lies in integrating processes across space, scale and environment.

Future undergraduate programmes can build this identity around several mutually reinforcing capabilities. Students should acquire conceptual understanding of physical and human processes; field and observational competence; quantitative and qualitative research methods; cartographic and geospatial literacy; critical understanding of spatial data; environmental and sustainability reasoning; clear written, graphical and map-based communication; and the ability to apply these capabilities to Indian geographical problems.

Employment communication also requires improvement. Geography graduates often possess skills whose labour-market value is not obvious from conventional course titles. Departments can make graduate capabilities more visible through project portfolios, GIS story maps, field reports, research posters, spatial-data projects and internships. Career orientation should extend beyond teaching and civil-service examinations to planning, geospatial analysis, environmental management, disaster-risk reduction, market and location analysis, development research, logistics, public health geography and sustainability-related work.

Institutional differentiation should nevertheless be respected. A well-resourced metropolitan university and a small district college cannot immediately deliver identical levels of advanced geospatial training. A realistic national strategy would establish minimum core learning outcomes while allowing staged infrastructure development, regional resource sharing, online access to spatial datasets and open-source software. Universities with stronger facilities can function as regional hubs for faculty development and specialised training.

The availability of open geospatial data creates further opportunities for locally grounded undergraduate research. Student projects can investigate urban growth, land-cover change, public-service accessibility, water bodies, crop patterns, local climatic variation, environmental degradation, transport networks, disaster exposure or rural transformation. Such projects make geography simultaneously local and technologically contemporary.

The National Geospatial Policy strengthens the external environment for this transformation by recognising geospatial data as strategically important across numerous economic and governance domains. Nevertheless, disciplinary reform should retain ethical scrutiny. Location data can reveal sensitive information about communities and individuals; satellite or administrative datasets may contain omissions and biases; maps can influence political and development decisions; and algorithmic classifications can create an appearance of precision exceeding underlying data quality. Ethical spatial-data literacy should therefore become part of undergraduate training.

Finally, the future of geography depends on stronger empirical knowledge about geography education itself. Nationally comparable subject-level data should be collected on undergraduate

enrolment, programme structure, gender and social composition, infrastructure, faculty strength, progression, employment and postgraduate transition. Periodic curriculum mapping across central, state and private universities would enable researchers to assess whether policy reform is producing substantive educational change. Without such evidence, discussions of the “decline” or “growth” of geography will remain disproportionately dependent on institutional experience and anecdotal impressions.

5. Conclusion

Undergraduate geography in India is situated at a potentially favourable but demanding historical moment. Higher education has expanded, female participation has increased, the institutional landscape has widened, NEP 2020 has created space for multidisciplinary and flexible undergraduate structures, and national geospatial policy has substantially increased the strategic visibility of spatial data and technologies. Together these trends create opportunities that were far less developed when earlier scholars raised concerns about the marginality and curricular stagnation of Indian geography.

The evidence nevertheless does not justify the simple conclusion that geography is automatically strengthening. One of the most basic indicators—a nationally comparable time series of undergraduate Geography enrolment—is not directly available from the principal AISHE undergraduate discipline tables. Geography remains distributed across Arts, Science and other programme structures. Consequently, claims of national enrolment growth or decline require caution. Creating more transparent subject-level statistical reporting should itself become part of the reform agenda.

The analysis also shows that curricular modernisation has begun. Current institutional examples demonstrate the incorporation of digital cartography, statistics, remote sensing and other analytical components alongside physical and human geography. NEP-oriented four-year programmes expand possibilities for research, internships and interdisciplinary learning. Yet policy adoption remains uneven across Indian universities, and syllabus change does not guarantee equivalent changes in classroom practice.

The principal challenge is therefore qualitative. Geography must avoid two opposite forms of reductionism. The first is the continuation of content-heavy teaching centred on the reproduction of descriptions and regional facts. The second is an excessively vocational reinterpretation of geography as GIS software training. Neither adequately represents the discipline. The more durable model is one in which geospatial technology is embedded within critical spatial thinking, field inquiry, theoretical interpretation and substantive understanding of human and environmental processes.

This conclusion answers the paper’s central research questions. India’s changing higher-education environment is expanding geography’s potential institutional base while

simultaneously requiring curricular adaptation. Geography is moving towards more analytical and technologically enabled education, although the pace and depth of change vary among institutions. Constraints remain in disciplinary integration, faculty capacity, subject-specific infrastructure, uneven student preparation, data availability and the translation of curricular innovation into learning outcomes. Its strongest future prospect lies in treating physical geography, human geography, field methods and geospatial science as mutually reinforcing rather than separate identities.

For policy and practice, undergraduate Geography programmes should therefore be organised around clearly specified graduate capabilities; progressively integrate GIS and remote sensing with spatial reasoning; strengthen field and research methods; create foundations in statistics and digital literacy; facilitate meaningful multidisciplinary combinations; expand faculty development; make greater use of open-source geospatial resources; establish internship and project partnerships; and communicate career pathways more systematically. These reforms should remain sensitive to differences in institutional resources and student backgrounds.

The study is limited by its dependence on secondary evidence and by the absence of nationally comparable undergraduate subject-level Geography statistics. The selected university curricula illustrate the direction of change but do not constitute a representative sample of every Indian university or college. Future research should therefore undertake systematic curriculum mapping, institutional surveys and longitudinal analysis of Geography enrolment and graduate outcomes.

Geography's future in Indian undergraduate education ultimately rests on making its intellectual purpose visible. Climate change, environmental degradation, urbanisation, migration, regional inequality, disaster vulnerability, resource conflicts and digital transformation are simultaneously spatial, social and environmental problems. A discipline capable of linking these dimensions has considerable academic and societal value. If undergraduate geography combines that integrative tradition with rigorous spatial analysis, contemporary geospatial technologies, critical thinking and locally grounded inquiry, it can move from recurring concern over its disciplinary position towards a more confident role in India's higher-education system.

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Data and interpretation note

All numerical higher-education indicators used in this paper refer to the survey years explicitly stated. AISHE's broad undergraduate disciplinary classifications have **not** been used to fabricate a separate Geography enrolment estimate. Selected university curricula are used only to demonstrate current curricular directions and are not claimed to represent all Indian higher-education institutions. The analysis is entirely secondary-data based; no survey respondents, interviews, questionnaires or primary statistical results have been assumed.