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The Role of Higher Education Institutions in Achieving the Sustainable Development Goals: Opportunities, Challenges and Strategic Directions in the Indian Context

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Abstract:

Higher education institutions (HEIs) serve as powerful engines for advancing the United Nations Sustainable Development Goals (SDGs) by generating knowledge, fostering transformative learning, conducting impactful research, and engaging communities in meaningful ways. This comprehensive paper analyses the evolving role of Indian HEIs in promoting Education for Sustainable Development (ESD) in alignment with the National Education Policy (NEP) 2020. Drawing upon systematic literature reviews, policy documents, empirical case studies, and the latest global ranking data, the study explores conceptual foundations, reviews global and India-specific scholarship, traces policy evolution, evaluates institutional contributions across multiple domains, identifies persistent barriers, and proposes evidence-based strategic pathways. The Times Higher Education (THE) Impact Rankings 2025 demonstrate encouraging progress, with four Indian universities entering the global top 100: Amrita Vishwa Vidyapeetham at =41 (1st in India), Lovely Professional University at =48, JSS Academy of Higher Education and Research at =56, and Shoolini University at =96. Amrita also secured 5th globally in SDG 4 (Quality Education) and 6th in SDG 7 (Affordable and Clean Energy). Despite these achievements, structural, pedagogical, resource-related, and socio-cultural challenges continue to limit the full realisation of ESD's potential. The paper concludes with actionable policy recommendations and a practical implementation framework designed to accelerate India's contribution to the 2030 Agenda. By offering a holistic, evidence-driven analysis, this study fills critical gaps in the existing literature and provides practical guidance for policymakers, university leaders, faculty members, and international development partners committed to leveraging higher education for a sustainable and equitable future.

Keywords: Higher education institutions, Sustainable Development Goals, Education for Sustainable Development, National Education Policy 2020, transformative learning, green campus initiatives, India, THE Impact Rankings

1. Introduction:

1.1 Background and Rationale:

Sustainable development has become the central organising principle for addressing the complex, interconnected crises of the 21st century, including climate change, biodiversity loss, persistent poverty, and deepening social inequalities. The concept gained international prominence through the 1987 Brundtland Commission report, which defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Over the subsequent decades, this idea evolved through landmark conferences in Rio (1992), Johannesburg (2002), and Rio+20 (2012), ultimately crystallising in the adoption of the 2030 Agenda for Sustainable Development with its 17 interconnected Sustainable Development Goals (SDGs) in 2015 (United Nations, 2015). Within this global framework, education is recognised not merely as a standalone goal (SDG 4) but as a foundational enabler capable of catalysing progress across all other goals.

Higher education institutions occupy a privileged position in this transition because they shape the knowledge, values, skills, and behaviours of future leaders, professionals, policymakers, and citizens. Through their core functions of teaching, research, campus operations, and community outreach, HEIs can model sustainable practices while equipping graduates with the competencies required to address real-world sustainability challenges. In India, home to the world's largest higher education system comprising more than 1,100 universities and over 45,000 colleges, this potential is particularly significant. The National Education Policy (NEP) 2020 has further strengthened this role by

explicitly embedding sustainability principles across the educational continuum, promoting multidisciplinary learning, experiential education, and environmental awareness as core elements of quality higher education (Ministry of Education, Government of India, 2020). The rationale for this paper stems from the urgent need to harness this vast human capital for sustainable national development while contributing meaningfully to global sustainability targets.

1.2 Research Problem and Gap in Existing Literature:

Although global scholarship on higher education and sustainable development has grown substantially since 2015, significant gaps persist, particularly in the Indian context. Most systematic reviews focus on developed economies or offer broad global overviews without sufficiently addressing the unique challenges and opportunities faced by rapidly expanding higher education systems in emerging economies like India (Berchin et al., 2021; Lim et al., 2022). Indian studies, while increasing in number, tend to be fragmented focusing either on isolated curriculum reforms, campus greening initiatives, or policy rhetoric without providing an integrated analysis that connects historical policy evolution, post-NEP 2020 implementation realities, empirical institutional practices, and measurable outcomes such as performance in international sustainability rankings. Moreover, few studies adequately link India's recent success in the THE Impact Rankings 2025 to broader ESD implementation frameworks or offer actionable, context-specific strategic pathways. This paper directly addresses these gaps by delivering a comprehensive, multi-dimensional examination that is both theoretically grounded and practically oriented.

1.3 Objectives of the Paper:

1. To clarify the conceptual and theoretical linkages between higher education, ESD, and the SDGs.
2. To synthesise key findings from global systematic reviews and India-specific scholarship.
3. To critically analyse the evolution of Indian higher education policy and its alignment with sustainability imperatives.
4. To evaluate the actual contributions of Indian HEIs across curriculum, research, campus operations, and community engagement.
5. To identify systemic barriers while proposing evidence-based strategic pathways and policy recommendations for accelerated progress.

1.4 Significance and Scope of the Study:

The significance of this research lies in its potential to inform national policy, institutional reforms, and international collaborations aimed at leveraging higher education for sustainable development. University administrators, faculty members, policymakers at the UGC and Ministry of Education levels, and development agencies will find practical insights for strengthening ESD integration. The scope encompasses public, private, and deemed universities across India, with selective international comparisons. The analysis draws upon peer-reviewed literature published between 2015 and 2026, official government documents, and the most recent THE Impact Rankings 2025 data.

2. Conceptual and Theoretical Framework:

2.1 Sustainable Development: Concept, Evolution and Definitions:

The concept of sustainable development has undergone continuous refinement since its formal articulation in the Brundtland Report. Initially focused on environmental protection, it expanded to incorporate economic viability and social equity as interdependent pillars. The 2030 Agenda further enriched this understanding by adopting a holistic, indivisible approach that recognises the need to balance the three dimensions while respecting planetary boundaries and ensuring social justice. In the Indian context, sustainable development is additionally informed by indigenous philosophical traditions emphasising harmony with nature and intergenerational responsibility (United Nations, 2015; Raman et al., 2025).

2.2 Education for Sustainable Development (ESD): From Awareness to Transformative Action:

UNESCO defines Education for Sustainable Development as "education that empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society" (UNESCO, 2020).

ESD represents a fundamental shift from traditional environmental education, which often remained limited to awareness-raising, toward transformative, action-oriented learning. It cultivates key competencies including systems thinking, anticipatory competence, normative competence, strategic competence, collaboration, critical thinking, and self-awareness. In higher education, ESD demands the integration of sustainability principles across curricula, pedagogy, research, and institutional governance rather than treating it as an add-on elective.

2.3 Higher Education Institutions as Catalysts for the UN 2030 Agenda:

HEIs function as critical change agents through four mutually reinforcing roles: (i) educating future sustainability leaders, (ii) generating and disseminating new knowledge via research, (iii) modelling sustainable practices on their own campuses, and (iv) engaging communities through outreach and extension activities (Berchin et al., 2021; Findler et al., 2019). When institutions adopt a "whole-institution approach," they create powerful synergies that amplify their contribution to multiple SDGs simultaneously. Systematic reviews confirm that HEIs achieve the greatest impact when sustainability becomes embedded in organisational culture rather than remaining a peripheral initiative (Lim et al., 2022).

3. Literature Review:

3.1 Global Systematic Reviews on Higher Education and SDGs:

Global scholarship post-2015 reveals a clear trajectory toward institutional transformation. Berchin et al. (2021) reviewed 75 studies and concluded that HEIs advance sustainable development primarily through knowledge creation, curriculum reform, campus operations, and stakeholder engagement. Lim et al. (2022), in their systematic mapping of 148 articles, categorised research into six thematic clusters and emphasised the necessity of moving beyond isolated projects toward systemic integration across teaching, research, operations, and governance. Serafini et al. (2022) analysed 178 empirical studies and found that institutions achieve superior SDG outcomes when they establish dedicated sustainability offices, align performance metrics with SDGs, and foster cross-disciplinary collaboration. These reviews collectively underscore the importance of leadership commitment, faculty development, and measurable indicators.

3.2 Indian Studies on ESD in Higher Education:

Indian research has accelerated following NEP 2020. Recent exploratory studies highlight how the policy creates structural opportunities for ESD integration while revealing implementation gaps, particularly in resource-constrained institutions (Gonzalez, 2026; Mohanty et al., 2025). Qualitative analyses of teacher education programmes demonstrate both challenges (inadequate faculty training) and opportunities (experiential learning mandates) for embedding ESD (Bascopé et al., 2025). Comparative studies of leading universities show that private institutions with strong international linkages tend to outperform public counterparts in green campus initiatives and SDG-aligned research output (Kushwaha, 2026; Raman et al., 2025). Overall, Indian literature consistently calls for stronger policy-practice linkages and robust monitoring mechanisms.

4. Higher Education Policy Landscape in India and Alignment with Sustainable Development:

4.1 Historical Evolution (1948–1986 Policies):

Post-independence higher education policy in India prioritised access, equity, and excellence. The University Education Commission (1948–49) and Kothari Commission (1964–66) laid foundational principles, while the National Policy on Education 1986 and its 1992 Programme of Action emphasised expansion and social inclusion. Environmental concerns appeared peripherally through environmental education components, but sustainability as a systemic imperative was largely absent.

4.2 National Education Policy 2020: Key Provisions and SDG Integration:

NEP 2020 marks a historic paradigm shift by mainstreaming sustainability across the entire educational ecosystem. The policy explicitly promotes multidisciplinary education, experiential and problem-based learning, integration of Indian knowledge systems with contemporary sustainability values, environmental education from foundational to

higher levels, and community-engaged projects. It aligns directly with SDG 4 while supporting all other goals through emphasis on holistic development, vocational integration, technology-enabled learning, and lifelong education. Provisions for flexible credit systems, multiple entry-exit options, and green campus mandates further strengthen ESD implementation (Ministry of Education, Government of India, 2020; Parveen, 2025; Ram, 2021).

5. Contributions of Indian Higher Education Institutions to Sustainable Development:

5.1 Curriculum Integration and Pedagogical Innovations:

Indian HEIs have increasingly embedded sustainability across disciplines through both standalone courses and cross-cutting modules. NEP 2020-driven reforms encourage project-based learning, field visits, case studies on local environmental issues, and interdisciplinary programmes combining engineering, social sciences, and environmental studies. Many universities now offer specialisations in sustainable development, climate action, and circular economy, fostering systems thinking and real-world problem-solving skills among students.

5.2 Research, Innovation and Knowledge Production:

Indian universities produce growing volumes of SDG-aligned research, particularly in renewable energy, sustainable agriculture, climate adaptation, and public health. Interdisciplinary research centres and incubation hubs supported by Atal Innovation Mission and UGC schemes have accelerated innovation in green technologies. Publications on sustainable development from Indian institutions have risen dramatically from 2015 to 2023, with notable citation impact in clean energy and responsible consumption (Raman et al., 2025).

5.3 Sustainable Campus Operations and Greening Initiatives:

Leading institutions have transformed campuses into living laboratories through solar power installations, waste segregation and composting, rainwater harvesting, biodiversity parks, and zero-waste policies. Amrita Vishwa Vidyapeetham and Lovely Professional University, for instance, have achieved high scores in campus sustainability metrics within the THE Impact Rankings 2025, demonstrating how green infrastructure can simultaneously reduce carbon footprints and serve as practical teaching tools.

5.4 Community Engagement, Outreach and Extension Activities:

Through National Service Scheme (NSS), Unnat Bharat Abhiyan, and dedicated extension departments, HEIs actively partner with rural and marginalised communities on projects involving watershed management, organic farming, sanitation, and disaster preparedness. These initiatives extend ESD impact far beyond campus boundaries while fulfilling social responsibility mandates.

6. Major Challenges and Barriers in Implementing ESD:

6.1 Institutional and Structural Constraints:

Indian higher education institutions continue to grapple with deeply entrenched institutional and structural barriers that significantly impede the mainstreaming of Education for Sustainable Development. Traditional disciplinary silos remain one of the most formidable obstacles, as departments operate in isolation with rigid curriculum frameworks that discourage interdisciplinary collaboration essential for addressing complex sustainability issues (Gonzalez, 2026). Despite NEP 2020's call for multidisciplinary education, many universities have been slow to restructure academic programmes, resulting in fragmented ESD delivery where sustainability is often confined to elective courses rather than integrated across core disciplines.

Furthermore, the absence of dedicated institutional mechanisms—such as centralised sustainability offices or cross-functional ESD committees—exacerbates coordination failures. In a large and diverse system spanning public, private, and deemed universities, governance structures frequently prioritise short-term enrolment targets and examination outcomes over long-term sustainability goals. Empirical evidence from recent studies shows that only a minority of institutions have developed comprehensive ESD policies, leading to inconsistent implementation across states and

institution types (Ankareddy et al., 2025). These structural constraints not only limit the depth of ESD integration but also undermine the whole-institution approach recommended by global frameworks.

6.2 Faculty Capacity Building and Pedagogical Limitations:

A critical barrier lies in the limited capacity of faculty members to deliver transformative ESD. Most academics in Indian HEIs have received traditional discipline-specific training that does not equip them with the pedagogical skills required for sustainability education, such as facilitating systems thinking, experiential learning, or assessing sustainability competencies (Mohanty et al., 2025). Resistance to change among faculty often rooted in workload pressures, lack of incentives, and unfamiliarity with innovative teaching methods further compounds the problem.

Recent surveys reveal that while awareness of SDGs is relatively high, confidence in implementing ESD pedagogies remains low, particularly in rural and state universities. Without systematic professional development programmes, faculty tend to adopt superficial approaches, such as adding a few lectures on climate change, rather than redesigning courses for deep transformative learning. This pedagogical gap directly affects graduate outcomes, as students graduate without the necessary skills to address real-world sustainability challenges (Acevedo-Duque et al., 2023; Teacher Education for Sustainable Development, 2025).

6.3 Resource, Funding and Governance Issues:

Resource scarcity represents another major impediment to effective ESD implementation. Most Indian HEIs, especially public and rural institutions, operate with constrained budgets that prioritise basic infrastructure and faculty salaries over green campus initiatives, digital tools, or sustainability research grants. Fragmented governance between central and state regulatory bodies often leads to overlapping mandates and inconsistent funding support, making long-term planning difficult (Gonzalez, 2026).

Although schemes such as the Atal Innovation Mission and UGC sustainability grants exist, their reach remains limited, and many institutions struggle to meet the matching-fund requirements. The result is uneven progress: elite private universities invest heavily in solar panels and biodiversity parks, while the majority of institutions lag behind in even basic waste management systems. This funding and governance disconnect not only slows campus greening but also restricts the scale of community outreach and research activities essential for achieving broader SDG targets.

6.4 Socio-Cultural and Quality-versus-Access Dilemmas:

India's extraordinary socio-cultural diversity creates unique challenges for ESD implementation. Sustainability concepts must be contextualised to local realities—ranging from urban megacities to remote tribal areas—yet many curricula remain based on Western models that fail to incorporate indigenous knowledge systems or address region-specific environmental concerns (Naik, 2024). Rapid massification of higher education has dramatically increased access, yet this expansion has frequently compromised quality, creating a persistent tension between enrolment targets and meaningful sustainability education.

Marginalised groups, including first-generation learners from rural backgrounds, often face additional barriers related to language, digital access, and awareness of sustainability issues. These socio-cultural dynamics risk widening rather than narrowing inequalities, as elite institutions advance faster in ESD while under-resourced ones struggle to meet basic educational needs. Addressing this dilemma requires nuanced, inclusive strategies that balance equity with excellence while respecting India's cultural pluralism.

7. Opportunities and Strategic Pathways Forward:

7.1 Technological Integration and Digital Learning Tools:

The rapid digital transformation of Indian higher education presents unprecedented opportunities for scaling ESD to millions of learners. Massive Open Online Courses (MOOCs), AI-powered personalised learning platforms, and virtual reality simulations enable interactive exploration of sustainability scenarios that would otherwise be inaccessible due to geographical or resource constraints (Roy, 2024). NEP 2020's emphasis on technology-enabled learning provides the policy backbone for integrating digital tools into ESD, allowing institutions to deliver

experiential content on climate modelling, circular economy design, and community-based projects through low-cost platforms.

Leading universities have already demonstrated success with hybrid models combining online modules with local field work, significantly enhancing student engagement and knowledge retention. Emerging technologies such as big data analytics for campus resource monitoring and gamified sustainability challenges further offer innovative pathways to make ESD both engaging and measurable. When strategically deployed, these tools can bridge the urban-rural divide and democratise access to high-quality sustainability education across India's vast higher education network.

7.2 Public–Private Partnerships and International Collaborations:

Public-private partnerships (PPPs) and global collaborations represent powerful levers for overcoming resource and capacity barriers in ESD implementation. Industry partnerships—particularly with green technology firms, renewable energy companies, and sustainability consultancies—can provide funding, internships, and real-world projects that enrich curriculum and research (Implementation Strategies of Higher Education Part..., 2026). NEP 2020 explicitly encourages such collaborations, enabling HEIs to co-create centres of excellence in areas such as clean energy and sustainable agriculture.

International linkages through networks like the International Sustainable Campus Network and UNESCO's ESD for 2030 programme facilitate knowledge exchange, joint research, and faculty training. Indian institutions that have actively pursued global partnerships have shown markedly superior performance in THE Impact Rankings, demonstrating how strategic alliances can accelerate institutional transformation. These collaborations not only bring additional resources but also expose Indian students and faculty to best practices from around the world, fostering a truly global perspective on sustainability challenges.

7.3 Performance in Global Rankings (THE Impact Rankings) and Best Practices:

The remarkable performance of Indian universities in the Impact Rankings 2025 provides both validation of progress and a roadmap for replication. Amrita Vishwa Vidyapeetham's global rank of =41 (1st in India), coupled with its 5th position worldwide in SDG 4 and 6th in SDG 7, showcases how a whole-institution approach—integrating curriculum reform, green campus operations, research excellence, and community outreach—can yield outstanding results (Times Higher Education, 2025; Amrita Vishwa Vidyapeetham, 2025). Similarly, Lovely Professional University (=48), JSS Academy of Higher Education and Research (=56), and Shoolini University (=96) have demonstrated that focused strategies in quality education, gender equality, and clean energy can propel institutions into the global top 100.

These success stories highlight replicable best practices: dedicated sustainability governance structures, evidence-based reporting aligned with SDG indicators, student-led green initiatives, and strong industry-academia linkages. With 135 Indian institutions participating in 2025, the rankings have created healthy competition that is driving systemic improvement. Institutions outside the top tier can learn from these leaders by adopting similar metrics-driven approaches and prioritising high-impact SDGs relevant to local contexts.

7.4 Lifelong Learning and Development of Sustainable Citizens:

NEP 2020's visionary emphasis on lifelong learning positions Indian HEIs to nurture generations of sustainable citizens equipped not only with technical knowledge but also with ethical values and practical skills for responsible living. Flexible credit systems, multiple entry-exit options, and continuous professional development programmes enable working professionals and adult learners to upskill in sustainability throughout their careers.

By embedding ESD across formal, non-formal, and informal education channels—including alumni networks, executive programmes, and community certification courses—universities can extend their impact far beyond traditional student cohorts. This lifelong approach transforms HEIs into lifelong learning hubs that continuously reinforce sustainability competencies, ensuring that graduates become agents of change in their workplaces, communities, and families. When combined with value-based education rooted in Indian knowledge systems, this pathway fosters a cultural shift toward sustainable lifestyles at the societal level.

8. Policy Recommendations and Implementation Framework:

To translate NEP 2020's vision into reality, the following recommendations are proposed:

1. Mandate annual whole-institution ESD audits with publicly reported results.
2. Establish a National Centre for Faculty Development in ESD with regional hubs.
3. Create a dedicated Green Higher Education Fund for campus sustainability projects.
4. Integrate SDG-specific indicators into NAAC and NIRF accreditation frameworks.
5. Develop a national ESD monitoring dashboard with real-time institutional data.

A three-tier implementation framework is suggested: short-term (1–2 years) actions focusing on awareness and capacity building; medium-term (3–5 years) actions targeting curriculum reform and infrastructure; and long-term (5–10 years) actions aimed at systemic cultural transformation and international leadership in sustainability.

9. Conclusion and Future Research Directions:

Indian higher education stands at a historic crossroads. The combination of NEP 2020's transformative vision and demonstrated success in global sustainability rankings provides a solid foundation for accelerated progress toward the 2030 Agenda. By fully embracing Education for Sustainable Development as a core institutional priority, HEIs can simultaneously enhance educational quality, reduce societal disparities, and contribute meaningfully to national and global sustainability goals.

Future research should prioritise longitudinal impact studies measuring graduate sustainability competencies, comparative analyses across Indian states, quantitative assessments of ESD's contribution to specific SDGs, and investigations into the role of emerging technologies such as artificial intelligence in scaling transformative learning.

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