

ESG APPROACH IMPLEMENTATION IN HIGHER EDUCATION INSTITUTIONS OF UZBEKISTAN: INSTITUTIONAL-LEGAL AND ORGANIZATIONAL-ECONOMIC CONDITIONS ANALYSIS

ABSTRACT

The accelerating adoption of sustainability frameworks in global higher education has placed ESG (Environmental, Social, Governance) principles at the centre of institutional performance assessment. This article presents a comprehensive analysis of the institutional-legal and organizational-economic conditions for ESG implementation in higher education institutions (HEIs) of Uzbekistan for the period 2020–2025. Drawing on three complementary data sources — official statistical data from the Agency of Statistics and the Ministry of Higher Education, Science and Innovations (MHESI), expert interviews with 42 purposively selected HEI administrators and researchers across 18 institutions spanning seven regions and three institutional types, and direct monitoring of 18 universities — the study addresses four core research questions regarding the regulatory framework, quantitative-qualitative indicators, institutional variation, and financial readiness for ESG investment. The findings reveal an 'implicit ESG regulatory environment' in which the updated Constitution (2023), the Education Law (2020), and the Green Economy National Strategy (2022) collectively establish a normative ESG foundation without explicitly mandating sustainability reporting. A pronounced Tashkent–region disparity in ESG readiness (74 vs. 24–52 points on a 100-point composite scale) and deep governance transparency gaps (22 vs. a regional target of 70 points) are documented. The Social component analysis reveals particular deficits in inclusive education infrastructure for students with disabilities and in community–HEI partnership mechanisms — dimensions receiving less policy attention than environmental and governance challenges. International benchmarking against Kazakhstan, Türkiye, South Korea, and Finland situates Uzbekistan's trajectory within a realistic 20-year reform horizon. The article concludes with a three-phase ESG roadmap and targeted recommendations for each ESG component.

Keywords: *ESG principles, higher education institutions, sustainability governance, institutional reform, regulatory framework, regional disparities, Green Economy, international benchmarking, HEI management, inclusive education, sampling design.*

1. INTRODUCTION

The integration of Environmental, Social, and Governance (ESG) principles into higher education management has emerged as one of the most significant institutional trends of the twenty-first century. Originally developed as a risk-assessment tool for corporate finance, ESG frameworks have been progressively adopted by universities and higher education institutions (HEIs) as a primary methodological criterion for evaluating institutional performance across sustainability, equity, and accountability dimensions [1].

Uzbekistan's higher education sector has undergone unprecedented transformation since 2017. The total number of HEIs increased from 77 in 2017 to 248 by 2025, student enrolment grew from approximately 310,000 to over 1.18 million, and the gross enrolment ratio rose from 9% to 47.5% [11]. This rapid quantitative expansion raises critical questions about the qualitative governance frameworks required to accompany and sustain it — questions to which ESG provides a structured analytical response. Governance capacity gaps, rather than resource availability, represent the binding constraint on Uzbekistan's higher education quality trajectory [35].

Despite the growing international recognition of ESG as a higher education management paradigm, dedicated empirical studies of ESG conditions in Uzbekistan's HEIs remain scarce — a significant research gap given the scale and pace of the ongoing reform process [2,3]. The present article addresses this gap through a system-wide, multi-dimensional analysis covering the period 2020–2025, employing a rigorously designed mixed-methods approach whose sampling strategy and measurement methodology are set out transparently in Section 3.

The article pursues four specific research questions: (1) How developed is Uzbekistan's regulatory framework governing ESG adoption in HEIs? (2) To what extent do the system's quantitative and qualitative indicators correspond with ESG readiness requirements? (3) How does ESG implementation status vary by HEI type and geographic region? (4) How favourable are current financial-economic conditions for ESG investment in HEIs?

2. LITERATURE REVIEW

The theoretical foundations of ESG in higher education draw on two converging bodies of literature: corporate sustainability governance and higher education management reform. Friede, Busch, and Bassen [31] demonstrate a significant positive relationship between ESG performance and financial outcomes across institutional types, while Leal Filho et al. [16] document how governance-related ESG dimensions are increasingly incorporated into international university accreditation criteria. Research linking governance quality to economic externalities through HEI reputation and community outcomes has advanced significantly in recent years, reinforcing the case for treating Governance not as a procedural add-on but as a strategic driver of institutional performance.

International experience indicates that countries achieving successful ESG integration in HEIs — notably Finland, the Netherlands, and South Korea — have consistently pursued a combination of clear legal obligations and graduated financial incentive mechanisms [6]. Park and Kim [6] document South Korea's 20-year reform trajectory (1995–2015), during which ESG requirements were introduced in public universities through an incremental three-phase approach: voluntary adoption, incentivised compliance, and mandatory reporting. This phased model is increasingly cited as the optimal pathway for transition economies [10].

Within the post-Soviet Central Asian context, Nurzhanova and Bekova [37] trace Kazakhstan's ESG progress in HEIs, attributing its 12.3% sustainability reporting rate primarily to internationalisation programmes adopted in 2012 and Bologna Process integration. Yilmaz and Tekin [38] similarly show how Türkiye's higher education system achieved a 28.4% ESG reporting rate over a decade of targeted policy. For Uzbekistan, governance capacity development — the ability to codify, monitor, and report ESG commitments — represents the most urgent institutional priority, as evidenced by the national trajectory documented in Section 4 [2,3].

For Uzbekistan specifically, Toshmatov [2] identifies the absence of explicit ESG obligations as the primary institutional barrier, while Saidov [3] argues that rapid HEI network expansion has outpaced qualitative governance development. Christopoulos and Kalfa [8] provide the theoretical distinction between 'implicit' and 'explicit' ESG regulatory environments, which the present study operationalises at the system level. The Social component of ESG — particularly its inclusive education and community engagement dimensions — has received less scholarly attention in the Central Asian context than the Environmental and Governance dimensions; this gap is addressed explicitly in Section 4.4 of the present study.

3. RESEARCH METHODOLOGY

3.1. Research Design and Data Sources

This study employs a mixed-methods design integrating quantitative statistical analysis with qualitative expert evidence and institutional monitoring. Three primary data sources were triangulated to ensure analytical reliability.

The first source comprises official statistical data from the Agency of Statistics of the Republic of Uzbekistan, MHESI annual reports, UNESCO and World Bank databases, and the Ministry of Finance, covering the period 2020–2025 [11,28,34]. The second source consists of expert interviews conducted in 2023–2024 with a purposively selected sample of 42 HEI

stakeholders. The third source comprises direct monitoring results from 18 HEIs conducted by the author during the 2023–2024 academic year, encompassing institutional documentation review, infrastructure audit, and structured observation of governance mechanisms.

3.2. Sampling Strategy and Composition

The sample of 42 experts drawn from 18 HEIs was constructed using purposive stratified sampling to ensure representation across three dimensions: (a) geographic region, covering all major HEI concentration areas in Uzbekistan; (b) institutional type, including state universities, private HEIs, and foreign branch campuses; and (c) functional role within the institution, ensuring perspectives from senior leadership, quality assurance, and academic staff levels. Table S1 presents the full sample composition.

Table S1. Sample Composition: 18 HEIs and 42 Experts by Region, Institutional Type, and Role

HEI / Region	HEI Type	No. of HEIs	No. of Experts	Expert Roles Represented
Tashkent City	State (5); Private (2); Branch (1)	8	14	Rector (2), Prorector (4), QA Head (4), Academic (4)
Samarkand Region	State (2); Private (1)	3	6	Rector (1), Prorector (2), QA Head (1), Academic (2)
Bukhara Region	State (1); Private (1)	2	5	Rector (1), Prorector (1), QA Head (1), Academic (2)
Fergana Region	State (1); Private (1)	2	5	Rector (1), Prorector (1), QA Head (2), Academic (1)
Karakalpakstan Republic	State (1)	1	4	Prorector (1), QA Head (1), Academic (2)
Khorezm Region	State (1)	1	4	Prorector (1), QA Head (1), Academic (2)
Andijan Region	State (1)	1	4	Prorector (1), QA Head (2), Academic (1)
Total	State (11); Private (5); Branch (2) = 18 HEIs	18	42	Rectors (6), Prorectors (11), QA Heads (12), Academic Staff (13)

Table S1. Author's own design. Selection criteria: (i) availability of internal ESG or sustainability documentation; (ii) participation in at least one international ranking or grant programme in the reference period; (iii) geographic and institutional-type diversity.

The geographic distribution spans seven administrative units, with heavier representation of Tashkent City (8 HEIs, 14 experts) reflecting the capital's concentration of larger and more internationally connected institutions. Deliberate oversampling of peripheral regions (Karakalpakstan Republic, Khorezm, Andijan) ensures that the regional ESG disparity documented in Section 4.3 captures genuine variation rather than sampling artefact. The institutional-type distribution — state (11), private (5), branch (2) — reflects the national population at approximately 56%/29%/15%, which broadly mirrors the 2024 national proportions (state 55.6%, private 36.3%, branch 8.1%) adjusted to ensure at least two branch campuses are included given their role as ESG performance comparators.

Expert selection within each institution followed a defined role hierarchy: the rector or acting rector was approached first; where unavailable or where the institution had a dedicated internationalisation or quality prorector, that individual was selected. In all 18 institutions, the head of the quality assurance department participated. Senior academic staff participants were selected on the basis of active involvement in institutional reporting, accreditation, or sustainability projects. The resulting 42-person panel represents a professionally diverse but institutionally anchored expert pool — sufficient for saturation of governance and ESG-specific insights, as confirmed by the absence of novel thematic categories emerging in interviews 37–42.

3.3. ESG Composite Score: Calculation Methodology

ESG readiness was operationalised through a composite 100-point scoring index comprising six indicators, each scored on a 0–20 point sub-scale. The equal-weight design reflects the absence of an empirically established relative weighting for these indicators in the Uzbekistan context and ensures that no single dimension — particularly the more easily measurable Environmental indicators — dominates the composite. The calculation methodology for each sub-indicator is specified in Table S2 below.

Table S2. ESG Composite Score: Indicator Definitions, Scoring Formulas, and Rationale

#	Indicator	Data Source	Sub-Scale Formula	Min → Max (points)	Rationale
1	Share of HEIs participating in international rankings (%)	MHESI annual report; THE, QS, UI GreenMetric databases	$S_1 = (R_{actual} / R_{target}) \times 20$, where $R_{target} = 25\%$ (OECD lower quartile)	0 → 20	Proxy for academic internationalisation and global visibility
2	Share of HEIs preparing ESG or sustainability reports (%)	MHESI Monitoring Report [14]; author's survey	$S_2 = (Rep_{actual} / Rep_{target}) \times 20$, where $Rep_{target} = 30\%$	0 → 20	Direct measure of ESG governance operationalisation
3	Female student share (%)	Agency of Statistics Gender Compendium [23]	$S_3 = \max(0, (F_{actual} - 30) / (50 - 30)) \times 20$; capped at 20 if $\geq 50\%$	0 → 20	Gender equity proxy; 30% = minimum threshold, 50% = full parity
4	Volume of international grants received (USD million)	Ministry of Finance [28]; MHESI [9]	$S_4 = \min(20, \ln(G_{actual} + 1) / \ln(G_{max} + 1) \times 20)$; $G_{max} =$ observed national maximum	0 → 20	Internationalisation activity; log-normalised to reduce outlier influence

#	Indicator	Data Source	Sub-Scale Formula	Min → Max (points)	Rationale
5	Share of faculty holding PhD or DSc degree (%)	Agency of Statistics Education Statistics [11]	$S_5 = (\text{PhD_actual} / \text{PhD_target}) \times 20$, where $\text{PhD_target} = 70\%$ (OECD average)	0 → 20	Research capacity as an S-component proxy (academic social responsibility)
6	Presence of documented ecological or social projects (binary)	Author's direct institutional monitoring; documentation review	$S_6 = 0$ if absent; $S_6 = 10$ if present but undocumented; $S_6 = 20$ if formally reported	0 → 20	Operational ESG engagement; differentiates documented from undocumented activity
	COMPOSITE ESG SCORE		ESG_composite = $S_1 + S_2 + S_3 + S_4 + S_5 + S_6$	0 → 100	Equally weighted (1/6 each); validated against MHESI monitoring data [14]

Table S2. Author's design. All formulas applied at the regional level of aggregation for Table 3. Sub-scores are continuous (not dichotomised), permitting partial credit for progress below the target threshold. Maximum possible composite score: 100 points.

The formula for the composite index is: $\text{ESG_composite} = S_1 + S_2 + S_3 + S_4 + S_5 + S_6$, where each $S_i \in [0, 20]$. Normalisation targets were selected as follows: S_1 uses 25% as the lower quartile for OECD university systems [15]; S_2 uses 30% as an achievable medium-term benchmark given current trajectories; S_3 uses 30% as a minimum threshold and 50% as full parity, following UNESCO gender equality guidelines; S_4 uses log-normalisation to reduce the dominant influence of capital-city HEIs' large grant volumes on regional scores; S_5 uses 70% as the OECD average for doctoral-qualified academic staff [15]; S_6 differentiates formally reported from merely present projects to incentivise documentation. The composite score was validated against MHESI monitoring data [14] and cross-checked against independent institutional assessments in the 18 monitored HEIs. The correlation between composite scores and expert-assessed ESG readiness ratings was $r = 0.84$ ($p < 0.001$), confirming convergent validity.

Normative document analysis covered seven key legal instruments enacted between 2020 and 2025, assessed against three ESG components (E, S, G) and classified by implementation status. The international comparative analysis benchmarked Uzbekistan against four reference countries — Kazakhstan, Türkiye, South Korea, and Finland — selected to represent comparable transition, intermediate, advanced Asian, and European ESG development trajectories respectively [34,35].

4. RESULTS

4.1. Legal-Normative Framework Analysis

The normative-legal framework governing HEIs in Uzbekistan was substantially updated between 2020 and 2025, creating what the present analysis characterises as an 'implicit ESG regulatory environment' — a context in which core ESG principles are legally embedded across multiple instruments without being explicitly labelled as such [8].

The revised Constitution of 2023 reinforces ecological rights (Article 50), social justice (Article 51), and governance transparency (Article 53), establishing the highest-order legal

foundation for ESG principles in Uzbekistan's institutions [5]. The updated Education Law (2020) introduced new norms for HEI social accountability, independent supervisory boards, internal audit, and public reporting [7]. The National Green Economy Strategy (2022) mandated energy audits in all state HEIs by 2030 — the first formal introduction of environmental sustainability requirements into the higher education regulatory framework.

Table 1. ESG-Relevant Provisions of Uzbekistan's Higher Education Normative-Legal Framework (2020–2025)

Normative Instrument	Key ESG-Relevant Provisions	Year Adopted	ESG Component	Implementation Status	Key Obligation
Constitution of Uzbekistan (revised)	Art. 50: ecological rights; Art. 51: social justice; Art. 53: governance transparency	2023	E, S, G	In force	Implicit ESG mandate for all state institutions
Education Law (revised)	HEI social accountability; independent supervisory boards; internal audit; public reporting norms	2020	S, G	Being implemented	Accountability and governance transparency
'New Uzbekistan' Strategy 2022–2026	Expanded private sector role; HEI modernisation; financial autonomy norms	2022	G, S	Being implemented	Financial independence and governance reform
Green Economy National Strategy	Energy audits in all state HEIs by 2030; green campus standards to be introduced	2022	E	Phased	Environmental sustainability baseline
HEI Development National Programme (2030)	International accreditation; ESG reporting mechanisms; financial and academic autonomy	2023	G, S, E	Being implemented	Phased ESG reporting framework
UN SDG Programme Integration	SDG 4 (quality education),	2021	E, S, G	Monitoring	Voluntary alignment

Normative Instrument	Key ESG-Relevant Provisions	Year Adopted	ESG Component	Implementation Status	Key Obligation
	SDG 13 (climate), SDG 16 (governance) — aligned with all ESG components				with UN SDGs
International Cooperation (UNESCO, EU Erasmus+, World Bank)	Grant conditions require ESG compliance; monitoring and transparent reporting obligations	2019–2025	E, S, G	Active	Externally-driven ESG compliance requirement

Table 1. Author's compilation based on normative document analysis. Tashkent, 2025.

The analysis of Table 1 reveals that Uzbekistan's core ESG-relevant legislative activity was concentrated in the 2020–2023 period. None of these instruments directly employs ESG terminology; all operate through the conceptual vocabulary of sustainable development, social accountability, and quality assurance. The analytical consequence is the absence of explicit ESG reporting obligations — a 'legislative gap' that the present study identifies as the primary institutional barrier to systematic ESG adoption [10].

Three institutional actors bear particular importance for the transition from implicit to explicit ESG governance: the Ministry of Higher Education, Science and Innovations (MHESI), which holds the mandate to establish and monitor ESG standards across the sector; the Accreditation Agency of Uzbekistan (UZAK), which can incorporate ESG performance criteria into institutional accreditation requirements; and the Ministry of Innovative Development, which has the authority to provide scientific and financial support for ESG projects [9].

4.2. Statistical Profile of Uzbekistan's Higher Education System (2020–2025)

Uzbekistan's higher education system experienced its most rapid expansion phase in recorded history between 2020 and 2025. The total number of HEIs increased from 114 to 248 — a 117.5% increase in five years — while student enrolment grew from 482,100 to over 1,180,300 and the gross enrolment ratio advanced from 24.9% to 47.5% [11,12]. The institutional structures being formed during this expansion phase will shape the sector's governance trajectory for decades — making the current period a critical window for ESG framework embedding. This trajectory is documented in Table 2 below.

Table 2. Key Indicators of Uzbekistan's Higher Education System (2020–2025)

Indicator	2020	2021	2022	2023	2024	2025
Total HEIs	114	127	142	185	211	248
— incl. state HEIs	77	83	91	112	122	138
— incl. private HEIs	37	44	51	73	89	110
Student enrolment (thousands)	482.1	594.3	796.8	890.4	1,020.4	1,180.3

Indicator	2020	2021	2022	2023	2024	2025
Gross enrolment ratio (%)	24.9	28.3	33.7	38.2	42.1	47.5
Faculty (thousands)	27.4	30.1	33.6	36.4	38.9	42.5
Faculty with PhD/DSc (%)	31.2	33.4	35.8	37.6	39.4	41.2
HEIs in international rankings	3	5	9	14	18	26
HEIs preparing ESG reports (%)	—	—	2.1	3.4	4.7	7.2
International grants (USD million)	31.2	48.3	67.1	89.4	120.0	158.0

Table 2. Source: Agency of Statistics of the Republic of Uzbekistan, Education Statistics 2025; MHESI Annual Report 2025.

The share of private HEIs increased from 32.5% in 2020 to 44.4% in 2025 — from 37 to 110 institutions — indicating significant structural diversification. From an ESG perspective, private HEIs exhibit comparatively greater flexibility in the Governance component, showing higher rates of innovation in management mechanisms [13]. However, rapid quantitative growth has not been accompanied by proportional ESG capacity development. Three structural barriers account for the gap between quantitative expansion and ESG maturity: the absence of ESG-specific professional development programmes for HEI staff; the non-existence of dedicated ESG units within HEIs; and the lack of targeted administrative resource allocation for ESG activities [14].

4.3. Regional and Institutional Variation in ESG Implementation

The composite ESG score, calculated using the methodology described in Section 3.3, reveals significant variation across both geographic regions and HEI types. Table 3 presents the regional distribution of key ESG indicators for 2024.

Table 3. Regional Distribution of ESG Implementation in Uzbekistan's HEIs (2024)

Region / City	No. of HEIs	Students (thousands)	Intl. Ranked HEIs	ESG Report (%)	Intl Grants (USD million)	Composite ESG Score (0–100)
Tashkent City	68	342.4	14	12.4	38.2	74
Samarkand Region	18	94.8	2	5.6	8.4	52
Bukhara Region	12	62.3	1	4.2	5.1	44
Fergana Region	14	78.4	1	3.8	4.7	42
Kashkadarya Region	10	52.1	0	2.1	3.2	34
Namangan Region	9	48.6	0	2.4	2.8	32
Andijan Region	11	56.2	0	3.1	3.4	35
Khorezm Region	8	38.4	0	1.8	2.1	28

Region / City	No. of HEIs	Students (thousands)	Intl. Ranked HEIs	ESG Report (%)	Intl Grants (USD million)	Composite ESG Score (0–100)
Karakalpakstan Republic	7	32.7	0	1.4	1.9	24
Other Regions	91	374.4	8	2.6	7.4	30

Table 3. Sources: MHESI official reports (HEI count, enrolment, rankings); author's 2024 survey of 248 HEIs and direct monitoring of 18 HEIs. ESG composite score computed using the six-indicator methodology and formulas described in Section 3.3 and Table S2.

Table 3 documents a pronounced Tashkent–regional bipolarisation in ESG readiness: the capital city's composite ESG score (74/100) exceeds the regional range (24–52) by a margin of 22–50 points. This disparity directly reflects existing inequalities in material-technical infrastructure, qualified faculty availability, and international partnership capacity [18]. Samarkand (52 points) and Bukhara (44 points) hold relatively higher regional scores — attributable to their longstanding international tourism and academic cooperation traditions and the comparative advantage derived from UNESCO heritage site status in attracting institutional partnerships. Karakalpakstan's lowest score (24 points) signals the need for dedicated regional HEI development programming [19,20].

Analysis by HEI type reveals that foreign branch campuses far outpace both state HEIs (3.1% full ESG systems) and private HEIs (7.2%) — with approximately 42% having fully operational ESG systems. This disparity arises directly from the obligation of branch campuses to comply with parent university ESG requirements. The low score of state HEIs reflects a governance architecture in which regulatory constraints are stronger but explicit ESG obligations have not yet been defined [17].

4.4. ESG Component Analysis: Environmental, Social, and Governance Dimensions

Table 4 synthesises the findings of the three-dimensional ESG analysis — based on expert interviews (n=42) and institutional monitoring of 18 HEIs — into a structured matrix of challenges, existing opportunities, and evidence-based recommendations for each component.

Table 4. Institutional Challenges, Opportunities, and Recommendations by ESG Component in Uzbekistan's HEIs

Component	Key Institutional Challenges	Existing Opportunities	Targeted Recommendations & Benchmarks
E — Environmental	Only 12.4% of state HEIs use renewable energy; ecological monitoring operational in only 7.8% of HEIs; no mandatory green infrastructure standards in place	National Green Economy Strategy (2022); Erasmus+ and ADB ecological projects; regional ecotourism development potential as a HEI capacity driver	Energy audits in all state HEIs by 2026; raise renewable energy share to 35%; standardise campus carbon footprint monitoring
S — Social	Female student share at 41.0% vs. 50% target; physical accessibility absent in 38% of HEIs for students with disabilities; community engagement	National gender equality programme; Uzbekistan's ratification of the CRPD (2021) creating disability-inclusive education obligations;	Raise female student share to 47% by 2027; mandate disability accessibility plans in all HEIs by 2026; establish community

Component	Key Institutional Challenges	Existing Opportunities	Targeted Recommendations & Benchmarks
	mechanisms largely ad hoc and undocumented; curriculum integration of sustainability literacy minimal	UNESCO inclusive education standards; growing civil society capacity for HEI partnership	engagement offices and formal partnership protocols; integrate sustainability literacy across all undergraduate curricula
G — Governance	ESG or sustainability reporting in only 4.7% of HEIs; supervisory boards meeting nominally (1–2 sessions/year); internal audit systems underdeveloped; governance transparency index at 22/100	Anti-corruption reform agenda; digital transformation initiative; international accreditation requirements (AACSB, ABET, FIBAA); GreenMetric participation as governance benchmarking tool	Mandate annual public accountability reports for all HEIs by 2026; establish ESG coordination unit norm; strengthen supervisory board functionality through binding procedural requirements

Table 4. Compiled by the author based on expert interviews (n=42) and normative document analysis. Tashkent, 2024. References [46]–[52] have been removed from this version; see narrative analysis below.

The Environmental component analysis reveals that ecological challenges in Uzbekistan's HEIs are predominantly 'invisible' — neither formally recognised in institutional documents nor systematically monitored. The 2023 audit data show that only 12.4% of state HEIs utilise renewable energy sources [22], while 7.8% have operational environmental monitoring systems — contrasting sharply with OECD averages of approximately 58% and 64% respectively. The E-component gap calls for a prioritised policy response, including the mandatory energy audit programme specified in the Green Economy National Strategy and the linkage of HEI climate action to regional ecotourism development agendas.

The Social component warrants extended analysis, as it encompasses a broader range of institutional obligations and presents a more complex implementation landscape than the E and G components. Four distinct sub-dimensions are examined here: gender equity, inclusive education for students with disabilities, community-HEI engagement, and curriculum-level social sustainability literacy.

Gender inequality remains the most extensively documented Social ESG challenge. The female student share of 41.0% in 2025 ranges from 34% (Kashkadarya Region) to 47% (Tashkent City) across regions [23]. This 13-percentage-point inter-regional disparity is particularly consequential: it means that the national aggregate figure substantially understates the severity of gender exclusion in peripheral HEI contexts. Equally concerning is the gender stratification within institutions: while the female student share approaches parity in some capital-city HEIs, female academic staff and senior administrative representation remains significantly lower, with women holding only 28.4% of professorial positions nationally and fewer than 15% of rector-level posts in state HEIs [23]. The Social component cannot be considered addressed by improving student admission equity alone; workforce and leadership parity requires targeted affirmative action policies.

Inclusive education for students with disabilities constitutes the most structurally underserved dimension of the Social component in Uzbekistan's HEI sector. Direct monitoring of

the 18 sampled institutions revealed that physical accessibility — defined as the presence of wheelchair ramps, accessible restroom facilities, and elevator access in all buildings — is absent in 38% of institutions. Adapted curricula, assistive technologies, and dedicated student support personnel for persons with disabilities are present in fewer than 12% of monitored HEIs. This situation is particularly concerning given that Uzbekistan ratified the UN Convention on the Rights of Persons with Disabilities (CRPD) in 2021, creating binding obligations to ensure equal access to higher education. Expert interviews revealed a systematic pattern: many HEI administrators acknowledged awareness of CRPD obligations but cited capital budget constraints and the absence of national accessibility standards for educational buildings as the primary implementation barriers. A phased accessibility roadmap — beginning with new construction requirements and extending to retrofitting of existing facilities — with clear compliance timelines and dedicated state budget lines is the most urgently needed policy response.

Community–HEI partnership mechanisms represent the third major Social component deficit. The concept of systematic, institutional community engagement — encompassing service-learning programmes, community research partnerships, local government collaboration, and civil society co-governance of university activities — is largely absent from Uzbekistan's HEI management culture. Of the 18 monitored institutions, only 4 had any formally documented community partnership agreement, and none operated a structured service-learning programme. The absence of community engagement was independently noted by expert interviewees as contributing to the low social legitimacy of HEIs in regional communities — particularly in non-capital regions where universities are perceived as nationally oriented institutions with limited local benefit. International experience from the UK's 'Civic University' movement, US community colleges, and Germany's regional universities of applied sciences ('Fachhochschulen') demonstrates that formalising community engagement through partnership protocols, joint project funding, and community representative participation in HEI governing boards significantly improves both Social ESG performance and regional economic development outcomes.

The curriculum integration of sustainability literacy constitutes the fourth Social component dimension requiring policy attention. Embedding sustainability, social responsibility, and ethical governance content within standard academic programmes — across all disciplines, not only in specialist sustainability degrees — provides a scalable, low-cost mechanism for operationalising the Social ESG component at the institutional level. Expert interviews in the sample HEIs confirmed that sustainability-related content appears in fewer than 8% of non-specialist undergraduate courses. UNESCO's Education for Sustainable Development (ESD) guidelines [34] and the European Standards and Guidelines (ESG 2015) [27] both identify curriculum integration as a necessary component of institutional ESG performance — a standard that Uzbekistan's HEIs have yet to systematically address.

Taken together, these four Social component dimensions present a more complex and multi-layered implementation challenge than the Environmental component (which is primarily a technical-infrastructure problem) or the Governance component (which is primarily a procedural transparency problem). The Social component requires simultaneous action on gender policy, disability law, community relations, and pedagogical practice — domains that cut across multiple government ministries and require coordination between MHESI, the Ministry of Social Protection, local governments, and civil society. This institutional complexity partly explains why the Social Inclusivity indicator (Table S2, Indicator 3) shows the smallest absolute development reserve (24 points) but the most dispersed locus of responsibility.

4.5. ESG Indicator Dynamics and Targets (2023–2030)

Table 5 presents the six-indicator ESG composite system with actual 2023 data, 2025 operational data, and 2030 regional target scores — enabling quantification of the 'development reserve' remaining in each ESG dimension. The targets are anchored to the scoring methodology described in Section 3.3 and Table S2.

Table 5. ESG Indicator Dynamics in Uzbekistan's HEIs: Actual Status, Operational Data, and 2030 Targets (100-Point Scale)

Indicator	2023 (Actual)	2025 (Operational)	Regional Target 2030	Development Reserve (2023→Target)
Environmental monitoring (%)	18	32	70	+52 points
Social inclusivity (%)	41	48	65	+24 points
Governance transparency (%)	22	38	70	+48 points
Financial autonomy (%)	46	54	75	+29 points
International accreditation (%)	28	45	70	+42 points
Research and innovation activity (%)	31	42	65	+34 points

Table 5. Computed by the author from MHESI monitoring data, expert interviews (n=42), and international comparative benchmarks [15,34]. Target values derived from SMART methodology; see Table S2 for normalisation formulas.

Table 5 identifies the two largest development reserves: Environmental Monitoring (52-point gap: 18 actual vs. 70 target) and Governance Transparency (48-point gap: 22 actual vs. 70 target). In proportional terms, Uzbekistan's HEIs currently cover approximately 25.7% (18/70) of the environmental monitoring target and 31.4% (22/70) of the governance transparency target [26]. The Social Inclusivity indicator (24-point gap) represents the smallest proportional deficit — but, as the detailed analysis in Section 4.4 demonstrates, this smaller numerical gap conceals the Social component's multi-dimensional complexity and the breadth of the disability accessibility and community engagement deficits. Financial Autonomy (46 actual, 75 target) holds the highest baseline score among all six indicators, reflecting measurable progress in HEI revenue diversification — a development strongly associated with accelerated ESG adoption capacity [31].

4.6. Financial and Organizational Conditions for ESG Investment

State expenditure on higher education increased from 7,840 billion UZS in 2021 to 23,500 billion UZS in 2025 — a three-fold increase in five years — while GDP share advanced from 0.54% to 0.97% [28]. Table 6 documents the key financing trend data.

Table 6. Higher Education Financing Indicators (2021–2025, Actual Data)

Indicator	2021	2022	2023	2024	2025
State expenditure (billion UZS)	7,840	10,320	14,680	18,400	23,500
As % of GDP	0.54	0.61	0.72	0.85	0.97
International grants (USD million)	48.3	67.1	89.4	120.0	158.0
Private investments (billion UZS)	1,240	2,180	3,760	5,200	7,400
HEI own-revenue share (%)	38.2	41.7	46.3	51.8	57.4
ESG project funding (billion UZS)	—	—	840	1,680	3,200

Indicator	2021	2022	2023	2024	2025
Per-student expenditure (thousand UZS)	5,420	6,840	8,740	10,380	13,100

Table 6. Source: Ministry of Finance of the Republic of Uzbekistan, *State Budget Execution Report 2025*; Agency of Statistics data.

The most salient finding in Table 6 is the emergence and rapid growth of dedicated ESG project funding: from zero in 2022 to 3,200 billion UZS in 2025 — a 3.8-fold increase in two years — signalling growing state commitment to ESG as a funded institutional priority [29]. The rise in HEIs' own-revenue share from 38.2% to 57.4% is a particularly significant structural development: HEIs with greater financial autonomy consistently adopt ESG principles more rapidly and comprehensively, as they can allocate strategic resources independently of external budgetary constraints [31]. However, the GDP share of higher education spending (0.97% in 2025) remains well below the OECD average (4.5%) and slightly below neighbouring Kazakhstan (1.04%) [30].

On the organisational side, only 6.2% of HEIs had a dedicated sustainability or ESG coordination unit as of the 2025 survey [32]. In the overwhelming majority of institutions, ESG functions are assigned as supplementary duties to quality assurance departments. The growth of international grants from USD 48.3 million to USD 158 million further expands the external resource base available for ESG investment — provided that grant-condition compliance requirements are leveraged systematically as drivers of ESG capacity-building rather than treated as one-off reporting obligations.

4.7. International Benchmarking

Uzbekistan's ESG readiness profile was benchmarked against four reference countries: Kazakhstan (comparable transition economy), Türkiye (intermediate-development economy), South Korea (advanced Asian economy), and Finland (European ESG leader). Table 7 presents the comparative data.

Table 7. International Comparative Analysis: ESG Indicators in Higher Education (2024, %)

ESG Indicator	Uzbekistan	Kazakhstan	Türkiye	South Korea	Finland
ESG report-preparing HEIs (%)	4.7	12.3	28.4	78.4	94.2
HEIs in international rankings (%)	8.5	18.6	32.4	64.8	82.3
Renewable energy share (%)	12.4	28.7	41.2	67.4	91.8
Female student share (%)	41.0	54.3	47.8	49.2	53.6
HEI GDP share (%)	0.97	1.04	1.82	2.44	4.98
Governance transparency index (0–100)	22	38	54	76	91

Table 7. Compiled by the author from UNESCO Global Education Monitoring Report 2025 [34], OECD Education at a Glance 2024 [15], and national statistical sources for each country.

Table 7 confirms that Uzbekistan currently occupies the lowest position across all six benchmarked indicators. This finding should be interpreted contextually: systematic higher education reform in Uzbekistan began in 2017, while the four reference countries have accumulated decades of experience. Kazakhstan — the most relevant comparator given shared historical context — achieved its 12.3% ESG reporting rate primarily through internationalisation programmes initiated in 2012 and Bologna Process integration [37]. South Korea's trajectory provides the most instructive reform model: having introduced ESG requirements in state universities incrementally over 1995–2015, it now operates at 78.4% [36]. Türkiye's experience — achieving a 28.4% ESG reporting rate through a decade of targeted policy from a similarly centralised starting architecture [38] — represents the most actionable short-to-medium-term benchmark for Uzbekistan. Finland's model — with full HEI autonomy, mandatory ESG accreditation integration, and a 4.98% GDP education spend [39] — constitutes Uzbekistan's long-term (2040–2050) aspirational reference.

5. DISCUSSION

The convergent findings across all four research dimensions paint a coherent institutional portrait: Uzbekistan's higher education system currently operates within an 'implicit ESG regulatory environment' that is normatively enabling but lacks the explicit reporting mandates that have driven ESG adoption in comparator countries. This analytical characterisation, theoretically grounded in Christopoulos and Kalfa's [8] implicit–explicit governance taxonomy, has direct implications for policy design.

The fundamental tension documented in this study is between the system's remarkable quantitative expansion — unprecedented in Central Asian higher education history — and the lagging development of qualitative ESG governance capacity. The 117.5% increase in HEI numbers in five years [11] has generated institutional scale that now requires a commensurate governance architecture to sustain. Without an explicit ESG framework, the quality consolidation phase risks being deferred indefinitely.

The pronounced regional disparities documented in Tables 3 and 7 carry a specific policy implication: a uniform 'one-size-fits-all' ESG implementation framework is institutionally inappropriate for Uzbekistan. Tashkent-based HEIs — with composite ESG scores nearly three times those of some regional institutions — and peripheral regional HEIs face fundamentally different constraint sets. A differentiated policy architecture, with distinct compliance timelines, resource packages, and performance benchmarks for capital-city, regional centre, and peripheral institutions, is the logical consequence of these findings.

The Social component analysis is the most policy-significant contribution of this article relative to prior ESG research in the Uzbekistan context. The finding that disability accessibility infrastructure is absent in 38% of HEIs, and systematically absent in peripheral regions, situates Uzbekistan's CRPD obligations as an immediate ESG compliance deficit — not a future aspiration. Similarly, the near-complete absence of formalised community–HEI engagement mechanisms reveals a dimension of social responsibility that has received minimal attention in national higher education policy, despite being a standard element of ESG governance frameworks in comparator countries. Addressing these Social component deficits requires inter-ministerial coordination that the current MHESI-centric governance architecture does not facilitate.

The Governance component gap — with a transparency index of 22/100 against a regional target of 70 — deserves particular policy priority, as governance improvements act as enabling conditions for E and S component progress. The near-universal nominality of supervisory boards (meeting 1–2 times annually, without substantive decision-making authority) represents a structural governance deficit that will not resolve through additional legislation alone; it requires concurrent capacity-building, incentive alignment, and cultural change within institutional leadership [25]. The financial trajectory — with dedicated ESG project funding growing 3.8-fold over 2023–2025 — creates the material conditions under which accelerated ESG adoption is economically feasible for the first time [31,33].

6. CONCLUSIONS

This article has conducted a comprehensive multi-dimensional analysis of the institutional-legal and organizational-economic conditions for ESG implementation in Uzbekistan's higher education institutions for the period 2020–2025. Six principal conclusions are advanced.

First, Uzbekistan's current normative framework constitutes an 'implicit ESG regulatory environment': the Constitution (2023), Education Law (2020), Green Economy Strategy (2022), and 'New Uzbekistan' Strategy collectively create a normative foundation for ESG adoption without yet mandating explicit sustainability reporting. Closing this legislative gap through phased explicit ESG requirements is identified as the primary policy priority [40].

Second, the system's exceptional quantitative expansion (117.5% HEI growth; 2.4-fold student enrolment increase) has not been accompanied by proportional ESG quality development. The ESG reporting share of 7.2% — though growing — cannot keep pace with institutional multiplication without targeted policy intervention [41].

Third, deep regional disparities persist: the Tashkent–regional ESG score gap of 22–50 points demands differentiated policy approaches rather than uniform national standards. A tiered implementation architecture — with distinct ESG compliance timelines and resource packages for capital-city, regional centre, and peripheral institutions — is the empirically grounded policy response [42].

Fourth, the largest ESG development reserves lie in Environmental Monitoring (52-point gap) and Governance Transparency (48-point gap). Uzbekistan's HEIs currently cover approximately 26% of the environmental target and 31% of the governance target — confirming that both dimensions require structurally transformative rather than incremental responses [26].

Fifth, the Social component presents the most multi-dimensional implementation challenge. Beyond gender equity, two critically underaddressed sub-dimensions require immediate policy attention: (a) disability accessibility infrastructure, absent in 38% of HEIs and directly implicating Uzbekistan's CRPD obligations; and (b) community–HEI engagement mechanisms, virtually absent across all monitored institutions. Financial conditions for ESG investment are increasingly favourable — state expenditure tripled, international grants at USD 158 million, ESG project funding grown 3.8-fold — but Social component progress requires inter-ministerial coordination beyond MHESI's current mandate.

Sixth, this study recommends a three-phase ESG roadmap: Phase I (2025–2027): Voluntary adoption — establishing ESG units, launching sustainability reporting pilots, mandating basic disability accessibility plans in all state HEIs, and formalising community partnership protocols; Phase II (2028–2030): Incentivised compliance — linking ESG performance to state funding allocations, accreditation criteria, and international grant eligibility; Phase III (2031–2035): Mandatory reporting — introducing explicit legislative ESG reporting requirements for all state HEIs with phased extension to private institutions [42].

These conclusions and the three-phase roadmap, grounded in a transparently designed 42-expert, 18-HEI study and a replicable composite scoring methodology, provide an empirical foundation for Uzbekistan's national ESG governance standards for higher education — standards that must be simultaneously ambitious in their long-term institutional architecture and pragmatic in their sequencing across E, S, and G dimensions.

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