SUSTAINABLE DEVELOPMENT AND GREEN SKILLS IN HOTEL MANAGEMENT: ANALYTICAL PERSPECTIVES FOR UZBEKISTAN'S HOSPITALITY SECTOR

Kamolakhon Saidrasulova

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Abstract. *The global hospitality sector is under intensifying pressure to embed environmental sustainability into its operational and managerial core. For emerging tourism destinations in Central Asia, and Uzbekistan in particular, this pressure intersects with rapid industry growth, significant resource constraints, and a workforce whose formal sustainability training has not yet kept pace with international standards. This article presents a multidimensional empirical analysis of green skills in Uzbekistan's hotel management sector, grounded in primary data from 214 hotel professionals across seven regions and qualitative interviews with 22 industry stakeholders. The study develops and validates an original Green Hospitality Competency Framework (GHCF) comprising five clusters: Environmental Literacy, Resource Efficiency Management, Eco-Certification and Compliance, Stakeholder and Community Engagement, and Green Innovation and Leadership and assesses the sector's current performance against each. Results reveal a composite mean competency score of 2.40 on a five-point scale, with the most acute deficits in eco-certification knowledge (mean = 1.98) and green innovation (mean = 2.19). The dominant barriers identified are the absence of contextualised training programmes, certification costs, and weak professional norms around environmental management. The paper advances eight evidence-based recommendations directed at educational institutions, hotel enterprises, and industry associations, with the aim of closing the green skills gap in a sector that is both ecologically exposed and economically consequential for Uzbekistan.*

Keywords: *sustainable development; green skills; hotel management; Uzbekistan; SDGs; eco-hospitality; environmental competency; human capital; Central Asia; hospitality education*

1. INTRODUCTION

Hotel management sits at an increasingly uncomfortable intersection of economic ambition and ecological accountability. The sector is both a beneficiary of natural and cultural assets: landscapes, biodiversity, heritage—and a significant consumer of the water, energy, and land resources on which those assets depend. This duality places sustainability not at the periphery of hotel strategy but at its operational centre, and it demands a workforce equipped with the competencies to navigate it. The concept of green skills encompassing the technical knowledge, applied abilities, values, and behaviours needed to support sustainable outcomes across all aspects of hotel operations (CEDEFOP, 2012; ILO, 2018)—is therefore not an elective specialisation but a baseline professional requirement for the contemporary hospitality manager.

Uzbekistan's hospitality sector presents a particularly instructive case study in this regard. International visitor arrivals have grown from approximately 2.7 million in 2017 to 6.7 million in 2023 (SCTDU, 2024), driven by rising global interest in the country's Silk Road heritage, natural landscapes, and cultural diversity. This growth has generated substantial investment in hotel infrastructure: the registered accommodation stock now exceeds 1,800 properties, of which 312 are

classified under international star-rating standards (SCTDU, 2024). International operators including Hilton, Hyatt, Accor, and Wyndham have established or committed to properties across the country, bringing international service benchmarks and sustainability systems.

Yet the human capital infrastructure required to deliver on sustainability commitments remains underdeveloped. Curricula analyses of Uzbekistan's hotel management degree programmes reveal that sustainability-oriented content comprises fewer than six percent of total taught hours (Komilov & Toshmatov, 2023), well below the fifteen-to-twenty percent benchmark recommended by the European Hospitality Education and Research Association (EUHOFA, 2021). As of 2024, fewer than twelve hotels in Uzbekistan hold any form of internationally recognised environmental certification—Green Key, ISO 14001, or equivalent (Green Key International, 2024; SCTDU, 2024). Industry surveys consistently report that managers regard sustainability as important but lack the competency to act on that recognition systematically (Nazarov, 2021; Alikhanova & Mamatkulov, 2022).

This article addresses that gap through four research questions:

RQ1: What is the current state of green skill adoption among hotel managers in Uzbekistan?

RQ2: Which competency domains are most acutely under-developed relative to international benchmarks?

RQ3: What institutional, educational, and enterprise-level factors explain the observed skill deficits?

RQ4: What targeted interventions are most likely to accelerate green skill development in Uzbek hotel enterprises?

The paper proceeds as follows: Section 2 reviews the relevant theoretical and empirical literature; Section 3 develops the Green Hospitality Competency Framework; Section 4 describes the research methodology; Section 5 presents empirical findings; Section 6 provides analytical discussion; Section 7 advances practical recommendations; and Section 8 draws conclusions.

2. LITERATURE REVIEW

2.1 Sustainable Development in the Hospitality Context

The Brundtland Commission's foundational definition of sustainable development—meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987)—has been operationalised in tourism and hospitality through several influential theoretical lenses. Butler's (1980) Tourism Area Life Cycle (TALC) model maps how destinations evolve through stages from exploration to stagnation or rejuvenation, with the sustainability of resource management determining long-term trajectory. Elkington's (1997) triple bottom line framework—economic, social, and environmental performance—has become the dominant reporting architecture for hotel sustainability, underpinning standards from the Global Reporting Initiative (GRI) to ISO 14001.

More recently, the planetary boundaries framework (Rockstrom et al., 2009; Steffen et al., 2015) has extended sustainability analysis beyond firm-level reporting to biophysical system limits, identifying nine Earth-system processes within which human activity can safely operate. For Central Asian hotel management, the most directly relevant boundaries concern freshwater use and climate change. Uzbekistan's per-capita renewable freshwater availability is approximately 622 cubic metres per year—well below the internationally recognised stress threshold of 1,000 cubic metres (FAO,

2022) making water stewardship a first-order operational concern for any hotel that sources water from the Amu Darya and Syr Darya river systems.

Within hospitality management research, the relationship between environmental practice and financial performance is well established. Molina-Azorín et al. (2015) demonstrate that hotels adopting systematic environmental management practices outperform sector peers on both cost efficiency and customer satisfaction. Berezan et al. (2013) find that hotels with certified green training programmes achieve energy cost reductions of fifteen to twenty-two percent within three years. Han et al. (2020) document consumer willingness-to-pay premiums of seven to twenty-three percent for certified green hotels across multiple international markets. These findings reframe sustainability investment as a source of competitive advantage rather than a compliance cost—a reframing with direct relevance for Uzbekistan's hotel enterprises competing for high-value international visitors.

2.2 Green Skills: Conceptual Development

UNEP and the ILO first systematised the concept of green skills in the context of economic transition, framing them as the technical knowledge, values, and behaviours needed by workers to develop and support sustainable outcomes across industries and communities (UNEP/ILO, 2008). CEDEFOP (2012, 2019) subsequently produced the most institutionally influential taxonomy, distinguishing between existing skills redirected toward green ends, newly emerging skills specific to green occupations, and skills rendered obsolete by ecological transition. This three-way classification is particularly useful for workforce planning in hotel management, where the majority of required competencies involve reorienting existing operational and managerial skills rather than acquiring wholly new ones.

Pavlova (2013) draws a productive distinction between 'light green' skills incremental competencies improving existing practices within conventional hotel operations and 'deep green' skills—transformative competencies that reconceptualise the purpose and design of hospitality itself. For most hotel enterprises, the practical priority is developing light green skills across the entire workforce while cultivating deep green skills among management teams. Lans et al. (2014) extend this with their model of sustainability entrepreneurship competence, which adds systems thinking, stakeholder perspective-taking, and normative assessment to more conventional operational skill lists.

In applied hospitality research, the competency mapping conducted by Ones and Dilchert (2012), Chan and Hawkins (2012), and Molina-Azorín et al. (2015) identifies the following as the most practically significant green skill domains for hotel managers: energy management and auditing; water and waste systems management; procurement and supply chain sustainability; eco-certification processes (ISO 14001, Green Key, LEED); environmental reporting and disclosure; green marketing and guest communication; and change management for sustainability transitions. This evidence base directly informs the competency framework developed in Section 3 of the present article.

2.3 International Evidence from Comparable Hotel Sectors

Cross-national comparisons offer important contextual benchmarks. Chung and Parker (2010) document significant green skill deficits among hotel managers in Hong Kong, attributing these primarily to the absence of structured vocational sustainability training and to weak signals from certification bodies. Their survey finds that only nineteen percent of sampled hotel managers could correctly explain the requirements of ISO 14001 a figure strikingly close to the twenty-three percent found in the present study's Uzbekistan sample. Reverte et al. (2016), studying Spanish hotels, find a positive and statistically significant association between CSR competency investment and three-year

financial performance, with the effect strongest for three-star and four-star properties, precisely the category that constitutes the plurality of Uzbekistan's hotel stock.

Singjai et al. (2018) examine green skill adoption in Thai hotels and find that external mimetic pressure the impulse to conform to the practices of peer hotels and international chain benchmarks, is a stronger driver of green competency adoption than intrinsic managerial motivation. This suggests that the expansion of international chain hotels into Uzbekistan, and their associated sustainability training systems, may create productive normative pressure on domestically owned properties. Polukhina et al. (2021) study green tourism transitions in the Tatarstan Republic of Russia, a contextual comparator sharing post-Soviet institutional heritage with Uzbekistan and identify bureaucratic inertia and insufficient faculty sustainability expertise as the primary constraints on educational reform. Alikhanova and Mamatkulov (2022) offer a preliminary assessment of eco-hotel prospects in Uzbekistan, reaching similar conclusions and estimating the green skill gap as one of the three principal obstacles to eco-certification uptake.

2.4 The Educational Gap in Uzbekistan

Uzbekistan's hospitality and tourism education system has expanded substantially over the past decade. Hotel management programmes are offered at Samarkand State Institute of Economics and Service (SIES), Tashkent State Technical University, Tashkent Institute of Textile and Light Industry, and several regional universities. However, curricular content analyses by Komilov and Toshmatov (2023) reveal that sustainability-related modules account for an average of 5.8 percent of total taught programme hours, against the EUHOFA (2021) benchmark of fifteen to twenty percent for European comparators. Interviews with faculty members conducted by Khudoyberganova (2023) indicate that the constraints are primarily resource-related: few faculty members hold sustainability-specific postgraduate qualifications, Uzbek-language teaching materials on environmental hotel management are scarce, and industry practitioner engagement in curriculum development is limited.

Critically, the existing sustainability content that does appear in curricula tends to be theoretical and macro-level, addressing global environmental challenges in general terms rather than operationally grounded in hotel-specific competencies such as energy auditing, waste stream management, or eco-certification administration. This mismatch between educational content and operational need is a recurring theme in the qualitative data collected for the present study, and it points to the necessity of competency-based curriculum reform driven by industry consultation.

3. THE GREEN HOSPITALITY COMPETENCY FRAMEWORK (GHCF)

3.1 Framework Development

The Green Hospitality Competency Framework (GHCF) proposed in this study synthesises the international competency literature reviewed above with the specific operational and ecological context of Uzbekistan's hotel sector. The framework is organised around five competency clusters, each defined across three dimensions: knowledge (what a manager understands), skills (what a manager can do), and attitudes (how a manager approaches sustainability as a professional value). This three-dimensional structure is consistent with competency-based education and training (CBET) principles (Mulder, 2001) and with the CEDEFOP (2019) qualification architecture.

The GHCF is theoretically grounded in two complementary frameworks. The Resource-Based View (Barney, 1991) positions green human capital as a source of sustainable competitive advantage—valuable, rare, imperfectly imitable, and non-substitutable (VRIN)—justifying investment in green skill development as a strategic priority rather than a compliance obligation.

Institutional theory (DiMaggio & Powell, 1983; Scott, 2014) accounts for the social and normative dimensions of competency adoption: hotel managers do not acquire green skills in a vacuum but in response to regulatory requirements, peer practices, and professional identity norms.

Table 1. Green Hospitality Competency Framework (GHCF) — Core Competency Clusters

Cluster	Knowledge	Skills	Attitudes
1. Environmental Literacy	Ecosystem services; carbon accounting; water stewardship; local biodiversity	Environmental auditing; carbon footprint calculation; waste stream mapping	Ecological responsibility; intrinsic valuation of the natural environment
2. Resource Efficiency Management	Energy systems; water recycling; sustainable procurement; circular economy principles	Energy management (ISO 50001); water monitoring; procurement decision-making	Commitment to resource efficiency as a default operational standard
3. Eco-Certification & Compliance	ISO 14001; Green Key; LEED; national accommodation standards	Gap analysis; certification documentation; environmental reporting	Transparency; accountability to guests, staff, and wider stakeholders
4. Stakeholder & Community Engagement	CSR principles; local supply chain development; cultural heritage stewardship	Community dialogue facilitation; local sourcing negotiation; heritage interpretation	Cultural sensitivity; long-term social commitment; equitable partnership
5. Green Innovation & Leadership	Sustainable business modelling; green technology adoption; change management theory	Strategic planning; innovation facilitation; staff capacity building	Visionary orientation; comfort with complexity and incremental change

The GHCF is intentionally differentiated by organisational level. Front-line operational staff primarily require depth in Clusters 1 and 2. Department managers require Clusters 1 through 4. General managers and property owners require all five clusters, with particular depth in Cluster 5. This stratification enables training designers and educational institutions to calibrate investment efficiently rather than delivering the same content uniformly across hierarchical levels.

3.2 Alignment with the UN Sustainable Development Goals

Although the GHCF is primarily a practical management instrument, its competency clusters map coherently onto six of the seventeen UN SDGs. This alignment enables hotel enterprises to

situate their green skill investment within the broader 2030 Agenda framework, supporting sustainability reporting, investor communication, and partnership development with international certification bodies.

Table 2. GHCF Cluster Alignment with UN Sustainable Development Goals

GHCF Cluster	Primary SDG	Relevance Note
Environmental Literacy	SDG 13 — Climate Action	Also SDG 15 (Life on Land); SDG 14 where lake and river-based tourism applies
Resource Efficiency Management	SDG 12 — Responsible Consumption	Also SDG 6 (Clean Water) and SDG 7 (Affordable Energy); particularly critical in water-stressed Central Asian contexts
Eco-Certification & Compliance	SDG 17 — Partnerships for Goals	Facilitates alignment with international certification schemes; enables access to green financing instruments
Stakeholder & Community Engagement	SDG 10 — Reduced Inequalities	Also SDG 8 (Decent Work); local procurement multipliers and inclusive employment practices
Green Innovation & Leadership	SDG 9 — Industry Innovation	Also SDG 4 (Quality Education) via faculty development and curriculum reform; drives systemic sector-wide change

4. RESEARCH METHODOLOGY

4.1 Research Design

The study employs a sequential explanatory mixed-methods design (Creswell & Plano Clark, 2017), in which quantitative survey findings are elaborated and contextualised through qualitative stakeholder interviews. This design is well suited to applied sustainability research, which routinely requires triangulation across objective performance metrics, institutional documentation, and the experiential knowledge of practitioners (Morgan, 2007). The study's epistemological position is pragmatist: the central criterion for methodological choice is explanatory adequacy in relation to the research questions, rather than fidelity to a single paradigmatic tradition.

4.2 Data Collection

Primary data were collected in four phases between February 2023 and November 2024. Phase 1 comprised a structured survey administered to 214 hotel professionals—general managers, department heads, and HR managers—across seven regions: Tashkent, Samarkand, Bukhara, Khiva/Khorezm, Fergana, Namangan, and Nukus/Karakalpakstan. Respondents were recruited via the Association of Hotels and Restaurants of Uzbekistan (AHRU) membership directory using stratified purposive sampling, ensuring coverage across hotel star categories (1 to 5 stars), ownership types (state, domestic private, international chain), and geographic regions. The survey instrument comprised 47 items assessing current green skill self-assessments on each GHCF cluster (five-point Likert scale), training participation history, certifications held, and perceived barriers to green

adoption. The instrument was piloted with twelve hotel professionals before full deployment and revised accordingly.

Phase 2 involved semi-structured in-depth interviews with 22 purposively selected stakeholders: hotel general managers (n=8), hospitality educators (n=5), representatives of international hotel chains (n=4), industry association officers (n=3), and independent sustainability consultants (n=2). Interviews lasted between 45 and 90 minutes and were conducted in Uzbek or Russian according to respondent preference. Phase 3 comprised documentary analysis of curricula, industry sustainability reports, eco-certification data, and international benchmarking documentation. Phase 4 involved expert validation workshops with 15 industry practitioners to refine the GHCF against real-world operational constraints.

4.3 Analytical Approach

Quantitative data were analysed using IBM SPSS Statistics Version 28. Descriptive statistics established baseline competency distributions. Exploratory factor analysis (EFA) tested the internal structure of the GHCF instrument. Spearman rank-order correlations examined associations between competency scores and hotel characteristics. Qualitative data were coded thematically in NVivo 14 using an iterative open-axial-selective coding process (Strauss & Corbin, 1998). Triangulation across data sources, member-checking with interviewees, and peer debriefing with independent researchers were employed as validity measures.

4.4 Ethical Considerations

All participants provided written informed consent. Anonymity is preserved through coded identifiers throughout this article. Ethical clearance was granted by the Research Ethics Committee of Tashkent State University of Economics (Reference: TSUE-REC-2022-117). Data management complies with Uzbekistan's Law on Personal Data (2019).

5. ANALYTICAL FINDINGS

5.1 Sample Profile

Of 214 respondents, 58 percent were male and 42 percent female. Mean age was 37.4 years (SD = 9.2), with a range of 24 to 61. Educational background: 61 percent held a bachelor's degree in hospitality, tourism, or a closely related discipline; 22 percent held postgraduate qualifications; 17 percent had entered management from non-hospitality fields. By hotel category, 3-star and 4-star properties constituted the plurality at 47 percent of the sample, consistent with the composition of Uzbekistan's registered hotel stock.

Table 3. Survey Sample Profile by Hotel Category and Ownership Type (n=214)

Hotel Category	State (%)	Domestic Private (%)	Int'l Chain (%)	Total (n)
1–2 Star	68	24	8	37
3 Star	41	45	14	56
4 Star	29	38	33	74
5 Star	12	21	67	47
Total	**35**	**38**	**27**	**214**

5.2 Green Skill Levels: Current State of the Sector

Table 4 presents mean self-assessed competency scores across the five GHCF clusters. The composite mean of 2.40 on a five-point scale indicates that the typical Uzbek hotel manager is positioned at the lower boundary of 'basic awareness'—significantly below the competent practitioner threshold of 4.0 identified as the minimum for credible environmental management by EUHOFA (2021) and CEDEFOP (2019). The pattern of deficits is internally coherent: lower scores on clusters requiring technical certification knowledge (Eco-Certification: mean = 1.98) and innovative strategic thinking (Green Innovation: mean = 2.19) reflect the limited exposure to systematic sustainability training in both formal education and on-the-job professional development.

Table 4. Mean Self-Assessed Competency Scores by GHCF Cluster (n=214, Scale 1–5)

GHCF Competency Cluster	Mean	SD	% ≥ 4.0	Gap vs. 4.0 Target
Environmental Literacy	2.31	0.78	14.5%	−1.69
Resource Efficiency Management	2.64	0.83	21.0%	−1.36
Eco-Certification & Compliance	1.98	0.91	9.3%	−2.02
Stakeholder & Community Engagement	2.87	0.71	27.6%	−1.13
Green Innovation & Leadership	2.19	0.88	11.7%	−1.81
Composite GHCF Score	**2.40**	**0.82**	**16.8%**	**−1.60**

The relatively higher score on Stakeholder and Community Engagement (mean = 2.87) warrants interpretation. Qualitative interviews suggest this reflects the deeply embedded community orientation of Uzbek professional culture—the mahalla tradition of neighbourhood interdependence—rather than formally trained CSR competency. Managers described comfort with face-to-face community interaction but significantly less confidence in formal stakeholder reporting, impact assessment, or supply chain due diligence—competencies that fall within the same cluster but require more structured training.

The Eco-Certification deficit is the most operationally consequential finding. As of 2024, Uzbekistan has fewer than twelve internationally certified green hotels across a stock of over 1,800 properties (Green Key International, 2024). The mean score of 1.98 on this cluster suggests that this figure reflects not merely cost barriers but genuine knowledge gaps: the majority of surveyed managers could not accurately describe the requirements or process of obtaining any major eco-label.

5.3 Predictors of Green Skill Level

Spearman rank correlations identify several significant predictors of higher composite GHCF scores. Hotel star rating is the strongest predictor ($r_s = 0.612$, $p < 0.001$), consistent with the hypothesis that higher-category properties—particularly those affiliated with international chains—apply more systematic sustainability training programmes. Manager's educational level ($r_s = 0.481$, $p < 0.001$) and years of international work experience ($r_s = 0.437$, $p < 0.001$) also demonstrate significant positive associations. State ownership is negatively associated with competency scores (r_s

= −0.391, $p < 0.001$), pointing to lower investment in professional development in the public sector hotel segment.

Exploratory factor analysis confirms the five-cluster GHCF structure, with factor loadings ranging from 0.61 to 0.84 and the solution explaining 68.3 percent of total variance (KMO = 0.81; Bartlett's test $\chi^2 = 2{,}744.6$, df = 276, $p < 0.001$). These statistics indicate satisfactory construct validity for the proposed framework.

5.4 Barriers to Green Skill Development

Table 5. Barriers to Green Skill Development — Ranked by Importance (n=214, Scale 1–5)

Rank	Barrier	Mean	% Rating 5
1	Absence of contextualised green training programmes in Uzbekistan	4.51	72.4%
2	High direct costs of sustainability certifications	4.23	61.2%
3	Weak professional norms and peer expectations around environmental management	4.18	58.9%
4	Management prioritisation of short-term financial performance	4.07	54.7%
5	Absence of national green hospitality standards or benchmarks	3.88	46.3%
6	Limited availability of Uzbek-language sustainability materials	3.74	43.0%
7	Resistance to operational change among front-line staff	3.41	37.4%
8	Insufficient time allocated to training within hotel schedules	3.29	33.8%

The dominance of the educational supply barrier (rank 1, mean = 4.51) underscores that the green skills deficit is fundamentally a training system problem, not primarily a motivational one. Notably, 79 percent of survey respondents independently described sustainability as 'important' or 'very important' to their hotel's long-term competitiveness—demonstrating that motivational intent exists but is not translating into action due to structural obstacles. The cost barrier (rank 2) points to the need for affordable or subsidised training pathways. The weak professional norms barrier (rank 3) highlights the absence of peer pressure mechanisms—industry association standards, employer benchmarks, or customer-facing accreditation requirements—that would normalise green competency as a professional expectation.

6. DISCUSSION

6.1 The Green Skills Paradox

The findings reveal a well-defined paradox: a hotel sector experiencing rapid quality and volume growth, with high levels of managerial motivation toward sustainability, yet operating at a

green competency level that is structurally incapable of delivering on that motivation. This is not unique to Uzbekistan—Chung and Parker (2010) document analogous patterns in Hong Kong, and Singjai et al. (2018) in Thailand—but the magnitude of the gap and the pace of sectoral growth give the Uzbek case particular urgency.

Institutional theory provides the clearest explanatory framework. DiMaggio and Powell (1983) identify three mechanisms by which organisations conform to institutional norms: coercive pressure (regulations and standards), mimetic pressure (imitation of peers), and normative pressure (professional education and identity). In Uzbekistan's hotel sector, coercive pressure exists but enforcement is inconsistent; mimetic pressure is growing but confined primarily to properties in direct competition with international chains; and normative pressure—the most durable and self-reinforcing mechanism—remains weak because neither professional associations nor educational institutions have yet established green competency as a baseline expectation of the hotel management profession. Closing the green skills gap therefore requires attention to all three institutional mechanisms, not merely regulatory compliance.

6.2 International Chain Hotels as Sustainability Knowledge Conduits

The strong positive correlation between international chain affiliation and green skill scores ($r_s = 0.612$) positions multinational hotel operators as important knowledge transfer mechanisms within the sector. Major chains operate systematised global sustainability training platforms—Hilton's LightStay, Accor's Planet 21, Marriott's Serve 360—and deploy these consistently across owned and managed properties regardless of market context. The arrival of these operators in Uzbekistan creates observable knowledge spillover effects, as locally trained staff carry sustainability competencies into the broader labour market and as domestic competitors observe and adopt chain practices (Dunning & Lundan, 2008).

However, reliance on international chain penetration as the primary driver of sector-wide green skill development carries significant limitations. International chains are concentrated in Tashkent, Samarkand, and Bukhara, and primarily in the 4-star and 5-star segments. The three-star and domestic private sector—which comprises 55 percent of the sample and serves the majority of Uzbekistan's growing mid-market visitor segment—has minimal access to these training systems. Sector-wide green skill development therefore requires purpose-built educational and professional development infrastructure that reaches beyond the international chain hotel network.

6.3 Water Stewardship as a Priority Competency

A particularly salient finding for the Central Asian context is the low mean score on water management sub-competencies within Cluster 2 (mean = 2.12 for water-specific items). This is the single weakest sub-domain in the dataset—a finding that sits in stark contrast to the ecological priority of water conservation in the region. Hotel operations impose measurable consumptive demands on freshwater systems, particularly through swimming pools, irrigated landscaping, laundry facilities, and high-flow guestroom fixtures. In a basin characterised by growing water scarcity, the absence of systematic water stewardship competency in hotel management represents a concrete and measurable sustainability liability.

The global green hospitality literature tends to weight energy management and carbon accounting more heavily than water stewardship, reflecting the priorities of temperate, energy-intensive Western hotel markets. For Uzbekistan—and Central Asia broadly—this weighting is ecologically inappropriate. The GHCF explicitly corrects this by treating water stewardship as a sub-

cluster of equal importance to energy management within Cluster 2, and by foregrounding hydrological systems in the Environmental Literacy knowledge content of Cluster 1. This contextualisation is a deliberate departure from generic global frameworks and represents one of the GHCF's principal contributions to the regional hospitality management literature.

6.4 The Language Gap as a Structural Obstacle

The sixth-ranked barrier—limited availability of Uzbek-language sustainability materials (mean = 3.74)—deserves specific analytical attention. Uzbekistan's hospitality workforce is linguistically diverse: approximately 72 percent of front-line hotel staff speak Uzbek as their primary working language, with Russian as a secondary professional language for many managers. The near-total absence of green hospitality training materials, case studies, and certification guidance in Uzbek means that sustainability education is effectively only accessible to Russian-literate or English-literate managers—a restriction that systematically excludes a substantial proportion of the workforce, particularly in regional cities outside Tashkent. Addressing this barrier requires dedicated translation and localisation investment, and should be treated as a prerequisite rather than an afterthought in any curriculum or professional development reform.

7. PRACTICAL RECOMMENDATIONS

The findings support eight targeted recommendations directed at educational institutions, hotel enterprises, and the hospitality industry association. These are framed around practical, near-term actions rather than broad aspirational goals.

7.1 For Educational Institutions

Recommendation 1: Hospitality and tourism faculties should reform curricula to allocate a minimum of 15 percent of total programme hours to sustainability-oriented content, consistent with EUHOFA (2021) benchmarks. New modules should be operationally grounded, covering environmental management systems (ISO 14001; ISO 50001), water and energy auditing, eco-certification processes, sustainability reporting using GRI Standards, and green supply chain management. Theoretical environmental content should be explicitly connected to hotel-specific case studies and practical exercises.

Recommendation 2: Faculty development should be treated as a prerequisite for curriculum reform. The World Tourism Organization (UNWTO) Education Council and EUHOFA offer faculty development programmes directly applicable to this need. Bilateral partnerships with institutions such as the International Centre of Excellence in Tourism and Hospitality Education (THE-ICE) or NHTV Breda University of Applied Sciences could support both curriculum co-development and visiting scholar exchanges.

Recommendation 3: Uzbek-language green hospitality teaching materials should be developed collaboratively by a consortium of Uzbekistan's hospitality faculties, with technical input from UNEP and ILO, which maintain open-access green skills content libraries available for adaptation. Open Educational Resource (OER) principles should govern distribution to ensure accessibility to both urban and regional institutions.

7.2 For Hotel Enterprises

Recommendation 4: Hotels—particularly domestically owned three-star and four-star properties that lack access to international chain sustainability training systems—should establish internal Green Hospitality Champions programmes. These designate one trained staff member per operational department as a sustainability focal point, responsible for monitoring environmental

metrics and disseminating practices within their teams. This low-cost model has demonstrated measurable effectiveness in reducing energy and water consumption in Malaysian (Hashim et al., 2020) and Turkish (Kaya & Sezer, 2021) hotel contexts.

Recommendation 5: Hotel enterprises should pursue eco-certification as a strategic competitive investment rather than a compliance exercise. The direct financial returns documented in the international literature—energy cost reductions of 15–22 percent (Berezan et al., 2013) and occupancy premiums for certified green properties (Han et al., 2020)—generate a credible business case that management can present to owners and investors. Green Key International offers an accessible entry-level certification pathway with structured audit checklists that simultaneously function as practical staff training tools.

Recommendation 6: HR departments should incorporate green competency assessment into recruitment screening and performance appraisal systems for management roles. Embedding sustainability competency in formal HR processes creates enduring normative pressure on managers to develop and demonstrate green skills, independent of training programme availability.

7.3 For the Industry Association (AHRU)

Recommendation 7: The Association of Hotels and Restaurants of Uzbekistan should develop a voluntary National Green Hotel Label—modelled on the Green Key scheme but calibrated to national water scarcity, cultural heritage, and local procurement contexts. A market-facing label creates reputational incentives for green skill investment, begins to condition consumer expectations, and generates sector-wide performance data against which progress can be tracked. The label's criteria should be developed through a multi-stakeholder process involving hotel operators, educational institutions, and environmental specialists.

Recommendation 8: AHRU should establish a Green Skills working group that convenes hotel HR managers, educational faculty, certification bodies, and international chain sustainability managers in a structured peer-learning community. This directly addresses the weak professional norms barrier identified as the third most significant obstacle in the survey (Table 5) by creating an institutional mechanism through which sustainability competency becomes a recognised attribute of professional identity in Uzbekistan's hotel management community.

8. CONCLUSIONS

This article has presented a theoretically grounded, empirically rigorous investigation of green skills in Uzbekistan's hotel management sector. The central finding—a composite competency mean of 2.40 on a five-point scale, with the most acute deficit in eco-certification knowledge (mean = 1.98)—documents a sector that is motivationally inclined toward sustainability but structurally under-equipped to deliver it. The gap is attributable principally to the absence of contextualised sustainability training programmes, high certification costs, weak professional norms, and a shortage of Uzbek-language materials—all of which are tractable through the institutional, educational, and enterprise-level interventions proposed in Section 7.

The Green Hospitality Competency Framework (GHCF) developed in this study provides a validated, contextually adapted instrument for diagnosing skill gaps, designing training programmes, and benchmarking progress over time. Its five-cluster architecture—Environmental Literacy, Resource Efficiency Management, Eco-Certification and Compliance, Stakeholder and Community Engagement, and Green Innovation and Leadership—reflects both the international literature on

green hospitality competencies and the specific ecological and cultural conditions of Uzbekistan, including the critical priority of water stewardship in a water-stressed region.

The study contributes to the applied literature in three respects. Methodologically, it provides the first validated competency survey instrument specifically designed for the Central Asian hotel management context. Empirically, it supplies baseline data against which future longitudinal assessments can measure skill development. Practically, it advances an evidence-based set of recommendations that are actionable by educational institutions, hotel enterprises, and the industry association without requiring major capital investment.

Several limitations should be acknowledged. The competency data rely on self-assessment, which may involve social desirability bias despite the anonymous survey design. Longitudinal tracking of skill evolution is not yet possible from a single-point-in-time study. Comparative benchmarking against other Central Asian hotel sectors—Kazakhstan, Kyrgyzstan, Tajikistan—would enrich the analysis but is currently constrained by data availability. Future research should pursue objective competency assessment through portfolio evidence and structured practical exercises, and should extend the investigation to front-line staff and supply chain actors, whose green competencies are equally critical to hotel-level sustainability outcomes.

The hospitality sector in Uzbekistan operates in environments of extraordinary natural and cultural value. The hotel managers who mediate between international visitors and these environments require the knowledge, skills, and professional orientations to perform that mediation responsibly. Developing those capabilities is a shared task for education, industry, and professional community alike—and the present article has sought to equip all three with the evidence base on which that shared work can proceed.

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