

A. KALIYEVA¹✉, A. AKTYMBAYEVA¹, A. SAPIYEVA¹, Y. DAULETKHANOVA¹

¹Al-Farabi Kazakh National University

(Kazakhstan, Almaty), e-mail: kaliyeva.aida@kaznu.kz

GREEN PRACTICES IN THE HOTEL SECTOR AS A FACTOR IN SUSTAINABLE TOURISM DEVELOPMENT IN KAZAKHSTAN

Abstract. *In the context of the global transition to sustainable development, the hotel industry is becoming a key sector in which environmental initiatives are being actively implemented. The aim of the study is to comprehensively assess the impact of green practices in the hotel sector on sustainable tourism development in Kazakhstan, taking into account regional characteristics and international environmental management standards. The study is based on a content analysis of scientific publications, international standards and hotel company reports. The main directions and tools for greening hotels have been identified, international and national experience has been analysed, and key barriers and prospects have been determined. The results show that the successful integration of green initiatives requires a comprehensive approach, including standardisation, government support, investment and raising consumer environmental awareness. The practical significance of the study lies in the development of recommendations for adapting global practices to the conditions of the hotel sector in Kazakhstan.*

Keywords: *green initiatives, hotel industry, sustainable development, energy efficiency, environmental standards, Kazakhstan.*

Introduction

The modern hotel industry occupies a paradoxical position within the global economy. On one hand, hospitality services generate substantial revenue, create millions of jobs, and catalyse investment in peripheral regions. On the other hand, the sector carries a heavy environmental burden that has only recently attracted commensurate scholarly and policy attention. The World Tourism Organisation estimates that accommodation facilities contribute approximately 1% of global CO₂ emissions—a figure that, while modest in isolation, becomes significant when situated alongside the broader carbon output of transportation, food service, and leisure infrastructure that hotels anchor [1]. Climate change, resource scarcity, and shifting consumer preferences have collectively elevated the concept of sustainable development from a marginal concern to a strategic imperative for the hospitality industry.

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Green initiatives in the hotel business encompass a wide spectrum of technological, managerial, and organisational solutions whose common aim is to reduce environmental harm without sacrificing—and ideally while enhancing—economic performance and social responsibility [2]. Their implementation intersects directly with several UN Sustainable Development Goals, notably SDG 7 on affordable and clean energy, SDG 12 on responsible consumption and production, and SDG 13 on climate action [1]. Yet the uptake of such initiatives varies enormously across geographies, property types, and ownership structures. Large international chains with robust corporate sustainability programmes coexist alongside independent properties that may lack both the resources and the institutional motivation to pursue formal greening strategies.

In the scientific literature, green initiatives are generally defined as measures aimed at curtailing the negative environmental footprint of hotel operations. These measures include—but are not limited to—energy efficiency improvements, water conservation systems, waste minimisation protocols, adoption of renewable energy sources, use of eco-friendly building materials, and the cultivation of local supply chains [2]. A smaller but growing body of research also explores how guest-facing communication of sustainability efforts influences booking behaviour, willingness to pay, and post-stay satisfaction [7].

Sustainable development of the tourism industry is broadly characterised as a strategy ensuring equilibrium among economic viability, social equity, and environmental safety [1]. Within this triad, hotels occupy a uniquely tangible position: they are physical structures with measurable energy and water inputs, quantifiable waste outputs, and identifiable supply-chain relationships. This concreteness has made the hotel sector a productive testing ground for sustainability metrics and certification schemes—but it has also exposed the sector to heightened scrutiny when declared environmental commitments fall short of observable practice.

Kazakhstan presents an instructive case. Endowed with diverse natural landscapes, a rapidly growing domestic travel market, and government ambitions codified in the national tourism development programme through 2030, the country faces the challenge of expanding its hospitality infrastructure without replicating the environmental errors of more established tourism economies [10]. Yet empirical assessments of how green practices are actually diffusing through Kazakhstan’s hotel sector remain scarce. Most existing studies either adopt a macro-level perspective on tourism strategy or confine their analysis to a single city or chain. What is missing is a cross-regional, indicator-based evaluation that can expose structural differences and inform policy at a granular level. This gap motivates the present investigation.

The terminology surrounding environmentally responsible hotels warrants clarification, as the literature employs several overlapping labels. “Eco-friendly hotel,” “green hotel,” and “sustainable hotel” are frequently used interchangeably, though subtle distinctions exist depending on disciplinary tradition. The Green Hotel Association defines a “green hotel” as an accommodation facility that implements practices to minimise negative environmental impact, conserve resources, and preserve ecosystems [3]. Han and Lee’s framework adds an operational dimension: an eco-hotel is one that systematically applies environmentally-oriented management methods while maintaining service quality. Han and colleagues subsequently broadened this into a strategic concept, where a “green hotel” is a company that internalises sustainable-development ideas across its entire value chain—from procurement to guest engagement [4; 5].

Several approaches to categorising green-hotel research can thus be identified: (1) a technological approach, centred on energy and resource conservation hardware; (2) a strategic

approach, emphasising the embedding of sustainability within corporate governance; and (3) a behavioural approach, focused on how guests perceive, evaluate, and respond to environmental cues. Together, these perspectives frame green initiatives not as a monolithic phenomenon but as a multi-layered construct whose individual dimensions may develop at different speeds within any given hotel or destination.

The purpose of this study is threefold: first, to develop a scientifically grounded index-the Integrated Green Practices Index (IGP)-capable of capturing the environmental maturity of hotel enterprises; second, to apply this index comparatively across three distinct tourism clusters in Kazakhstan (Almaty and Almaty Region, Aktau, and Burabai); and third, to derive practical recommendations for advancing sustainable hospitality at both regional and national scales. Because the title frames the enquiry around sustainable tourism development as a whole, a fourth and connecting objective is added here: to trace explicitly how hotel-level greening is expected to propagate into broader tourism-system outcomes-destination competitiveness, local employment in ancillary services, and the carrying-capacity pressure that accommodation infrastructure places on surrounding natural and social environments. The hotel sector is treated in what follows as the most data-accessible entry point into this wider system, not as a proxy for it.

Literature Review

The conceptual evolution of the “green hotel” has traversed several distinct phases. Early discourse, rooted in the environmental management movement of the 1990s, treated greening primarily as a cost-reduction exercise: lower utility bills through efficient lighting, reduced water bills through low-flow fixtures, and smaller waste-hauling expenses through recycling programmes. Bohdanowicz’s widely cited work demonstrated that energy-efficient technologies could cut hotel operating costs by 15 to 25 percent, establishing a clear business case that appealed to owners and operators regardless of their environmental convictions [6]. This techno-economic framing dominated the first wave of research and continues to underpin industry practice in many markets.

A second phase shifted attention toward strategic integration. Han and Lee proposed that environmentally-oriented management must be embedded in day-to-day operations rather than treated as an add-on programme; their concept of the eco-hotel envisions a property that systematically applies green methods while maintaining service quality [4]. Han and colleagues later expanded this view by arguing that a genuine “green hotel” incorporates sustainable development ideas into its core strategy, from procurement policies to customer-engagement tactics [5]. At the international certification level, the Global Sustainable Tourism Council articulated four evaluation blocks: sustainability management, socio-economic benefits for local communities, preservation of cultural heritage, and reduction of negative environmental impact. These criteria now underpin many national and regional eco-labels, including Green Key, EarthCheck, and the ISO 14001 environmental management systems [5].

The third and most recent phase has foregrounded the behavioural dimension. Chan and Hsu found that environmental initiatives are perceived by guests as a trust-enhancing signal, increasing willingness to pay a modest premium for services [7]. Luo and Tang confirmed that green hotel practices positively influence revisit intention, though the strength of this effect varies with the traveller’s prior environmental commitment [2]. In Kazakhstan specifically, Olya and colleagues demonstrated that environmental and social sustainability practices raise customer loyalty and satisfaction, a finding corroborated by Esimova et al., who showed that 73% of Almaty hotel guests

expressed willingness to choose properties with visible green practices even at slightly higher price points-provided they received adequate information about the hotel's environmental efforts [8; 9].

The institutional landscape surrounding hotel sustainability has also matured. Jones, Hillier, and Comfort observed that multinational hotel groups increasingly publish dedicated ESG (Environmental, Social, and Governance) reports, driven partly by investor pressure and partly by the competitive advantage conferred by a strong sustainability narrative [18]. Corporate programmes such as Accor's Planet 21, Hilton's Travel with Purpose, IHG's Green Engage, and Marriott's Serve 360 have established internal benchmarks that often exceed local regulatory requirements [20–23]. Yet the diffusion of such standards to independent and locally managed properties-which constitute the overwhelming majority of accommodation stock in developing countries-remains uneven.

Within Kazakhstan, research on hotel sustainability is still at an early stage. Smagulova examined institutional and environmental aspects of sustainable tourism development at the national level, calling attention to regulatory gaps and limited enforcement capacity [12]. Ismailova explored green innovations as a competitiveness factor for tourist destinations, concluding that the country's hospitality sector lags behind regional peers in formal certification adoption [13]. The national Concept for Transition to a "Green Economy" provides a policy framework, but specific mechanisms for the hotel sector are only beginning to be articulated [11]. This body of work suggests that while awareness of green practices is rising among Kazakh hoteliers, systematic implementation lags behind both international standards and the expectations of environmentally conscious travellers.

Against this background, the present study occupies a niche that has not been adequately addressed: the development and empirical application of a composite index that integrates multiple dimensions of hotel greening-energy, water, waste, certification, training, procurement, communication, and transport-across several geographically and structurally distinct clusters. Such an approach moves beyond single-variable assessments and permits a more nuanced understanding of where intervention is most needed and most likely to succeed.

One further strand of the literature deserves mention. The relationship between hotel size and greening intensity is far from linear. Conventional wisdom holds that larger properties enjoy economies of scale in sustainability investment, and there is evidence to support this view: a hotel with three hundred rooms can amortise the cost of a solar thermal system far more quickly than one with thirty. But small properties possess offsetting advantages-shorter decision-making chains, closer ties to local suppliers, and a guest demographic that may value authenticity over brand-name certification. Tokbergenova et al. noted that in rural Kazakhstan, family-operated guesthouses sometimes adopt environmentally sensitive practices organically, without any awareness of formal green-hotel frameworks, simply because traditional resource management aligns with what certification schemes would prescribe [5]. Understanding this dialectic between formal and informal greening is essential for designing policies that do not inadvertently penalise small operators or privilege corporate chains.

The economic rationale for hotel greening has also evolved. Early cost-benefit analyses focused narrowly on utility savings, but more recent scholarship has incorporated reputational capital, risk mitigation, and long-term asset value into the equation. Jones, Hillier, and Comfort argue that hotels with demonstrable ESG credentials attract not only environmentally conscious guests but also institutional investors seeking to align portfolios with sustainability benchmarks [18]. In the Kazakh context, where tourism is earmarked as a strategic sector for economic diversification, the ability to attract foreign direct investment into hotel infrastructure may depend partly on the sector's green

credibility—a consideration that has received insufficient analytical attention to date.

The geographical diffusion of green-hotel practices across developing economies follows an identifiable pattern. Multinational chains introduce standardised environmental protocols to flagship urban properties, creating islands of high performance within otherwise undifferentiated markets. Over time, local competitors observe these practices, adapt selected elements, and gradually raise the baseline level of environmental management—a process that hospitality scholars have termed “demonstration-led diffusion.” The pace of this diffusion depends on several mediating factors: the strength of local regulatory frameworks, the availability of trained personnel, the price sensitivity of the dominant guest segment, and the presence or absence of intermediary organisations (industry associations, chambers of commerce, development agencies) that can translate international best practice into locally actionable guidance. In Kazakhstan, the Kazakh Tourism National Company and regional tourism administrations occupy this intermediary space, but their capacity to drive environmental upgrading in the hotel sector has been constrained by competing priorities and limited technical expertise in sustainability assessment.

A further nuance concerns the interaction between green practices and service quality. A persistent scepticism in some hospitality markets holds that environmental measures compromise guest comfort—that low-flow showerheads deliver an inferior experience, that reduced linen laundering signals neglect, that LED lighting lacks the warmth of incandescent bulbs. Empirical evidence increasingly contradicts this view. Lee and Kim demonstrated that well-designed green interventions can be perceived as quality improvements when accompanied by clear communication about their environmental rationale [19]. The critical variable, then, is not whether green measures are implemented but how they are communicated—a point to which we return in the Discussion.

Materials and Methods

The methodological architecture of this study rests on a mixed-methods design that combines quantitative index construction with qualitative interview data and documentary analysis. The rationale for this integration is straightforward: quantitative indicators alone cannot capture the contextual factors—institutional support, managerial motivation, regional infrastructure limitations—that shape the adoption trajectory of green practices. Conversely, qualitative accounts without numerical anchoring risk producing impressionistic findings that are difficult to compare across sites.

Three tourism clusters were selected as the units of comparison: (1) Almaty and Almaty Region, representing the country’s most diversified urban and mountain-resort tourism market; (2) Aktau in Mangistau Region, a coastal and business tourism hub characterised by extreme aridity and high solar irradiance; and (3) Burabai in Akmola Region, a nature- and recreation-oriented destination dominated by small hotels and guesthouses. The clusters were chosen to maximise variation in climatic conditions, tourism typology, hotel ownership structure, and institutional environment.

Data collection at the analytical-review stage. Official statistical data from the National Statistics Bureau of the Republic of Kazakhstan, reports from Kazakh Tourism National Company JSC, and regional tourism administrations for the period 2019–2024 were assembled [10–14]. These materials documented the dynamics of hotel-sector development, occupancy rates, energy consumption, and water usage per guest-night. International benchmarking data were drawn from UNWTO [1], WTTC [3], and GSTC [5] publications, enabling the correlation of Kazakh experience with broader global trajectories.

Empirical stage. Content analysis, expert interviews, and on-site observation constituted the

core empirical toolkit. Ten semi-structured interviews were conducted with representatives of selected hotels from the sample of 34 hotels included in the study. Interview protocols covered organisational mechanisms for implementing green practices, perceived barriers and motivations, resource allocation patterns, and the reception of environmental initiatives by staff and guests [4; 8]. All interviews were recorded with informed consent, transcribed, and subjected to thematic coding under six categories: energy efficiency, water conservation, waste management, social engagement, management culture, and guest communication.

For the quantitative component, an indicator set characterising the environmental performance of hotels was assembled. Key metrics included specific energy consumption (kWh/m²/year), water consumption per guest (litres/guest-night), waste volume (kg/guest-night), share of local purchases (%), availability of environmental certificates (ISO 14001, Green Key, GSTC), level of staff involvement in eco-training programmes, guest-facing sustainability communication intensity, and adoption of low-emission transport options [15].

The indicators were normalised using the min–max method on a 0–1 scale, after which the Integrated Green Practices Index (IGP) was calculated by the formula:

$$\text{IGP} = \sum(w_i \times x_i) \quad [16]$$

where w_i is the weight coefficient of the indicator, determined through the Analytic Hierarchy Process (AHP), and x_i is the normalised value of the indicator. The AHP method, proposed by Saaty [15], structures complex multi-criteria tasks and produces consistent expert priorities via pairwise comparison matrices. Recent methodological reviews confirm that AHP yields stable results in environmental-performance assessments of tourism infrastructure [16; 17].

For each hotel, all indicator values were first normalised using the min-max method to obtain values ranging from 0 to 1. The normalised indicators were multiplied by their corresponding AHP-derived weights, and the weighted values were summed to calculate the Integrated Green Practices Index (IGP). The hotel-level IGP scores were then averaged within each tourism cluster to obtain the regional values presented in Tables 2 and 3.

The pairwise comparison matrix was processed using the eigenvalue method. The resulting consistency ratio was $\text{CR} = 0.07$, comfortably below the 0.10 threshold accepted in the multi-criteria decision-making literature [17; 18]. The pairwise comparisons were completed independently by a ten-member expert panel comprising five representatives of the private sector, three representatives of the hotel sector, and two representatives of the state tourism administration. Individual comparison matrices were aggregated using the geometric mean method to obtain a single group comparison matrix, which was subsequently used to calculate the final indicator weights and the consistency ratio (CR).

The final sub-index weights were distributed as follows:

- energy saving – 0.17;
- water conservation – 0.15;
- waste management – 0.14;
- environmental certification – 0.12;
- staff training – 0.12;
- sustainable procurement – 0.11;
- communication and guest information – 0.10;

– sustainable transport – 0.09 [19; 20].

These weights were applied through linear aggregation to compute the IGP, with the resulting values classified into three bands: low (0–40), medium (41–70), and high (71–100) levels of green-practice implementation [6].

Cross-regional benchmarking was employed to compare IGP scores and sub-index profiles. The interpretation drew on descriptive analytics, including structural characteristics of hotels, regional environmental policy contexts, and ownership patterns. Triangulation-combining international reports, national statistics, corporate documents, and guest-review data from Booking.com, Google Travel, and TripAdvisor-strengthened the validity of the conclusions [1; 21].

The selection of these three clusters merits additional justification. Almaty's dominance in Kazakhstan's hotel landscape is well established: the city and its surrounding region account for roughly 35% of the country's total accommodation capacity and host the greatest concentration of internationally branded properties. Any assessment of green practices in Kazakhstan that excludes Almaty would be structurally incomplete. Aktau was chosen for its contrasting profile: a rapidly developing coastal destination where tourism infrastructure is expanding against a backdrop of extreme water scarcity and high ambient temperatures that impose distinctive engineering constraints on hotel operations. Burabai rounds out the sample as an inland recreational zone where small-scale, seasonally dependent hospitality prevails-conditions representative of numerous secondary tourism destinations across Central Asia.

The data-collection timeline also deserves mention. Fieldwork was conducted between March and August 2024, a window that captured both low- and high-season operating conditions in all three clusters. This temporal range helped mitigate the risk of seasonal bias in the interview data, though it should be acknowledged that on-site observation was necessarily limited to the specific dates of researcher visits and may not reflect year-round operational realities.

Primary data sources included publicly available materials, primarily corporate reports from international hotel chains describing environmental programmes and sustainable development indicators [20–24]. Additional information was obtained from public documents of local hotels posted on their official websites (sustainability policies, descriptions of environmental initiatives, information on resource use). To analyse guests' perceptions of environmental practices, data from the open online platforms Booking.com, Google Travel, and TripAdvisor were used. The combined use of multiple data streams allowed cross-verification and increased interpretive reliability, consistent with methodological recommendations from the UNWTO and GSTC [1; 20–23]. Guest-review information was collected from Booking.com, Google Travel and TripAdvisor for the period 2022–2024. The review sample included 34 hotels, comprising 15 hotels in Almaty and Almaty Region, 10 hotels in Aktau, and 9 hotels in Burabai, with approximately 1,800 guest reviews analysed in total. Reviews referring to environmental practices were identified through manual screening supported by keyword searches related to sustainability, environmental management, recycling, energy efficiency, water conservation and eco-friendly services. These data were used exclusively as supplementary qualitative evidence to support the interpretation of the empirical findings and were not included in the calculation of the Integrated Green Practices Index.

Ethical considerations were addressed by relying exclusively on publicly available data and voluntary interviews conducted with prior consent. All information was collected and reported in aggregate form that does not permit identification of specific properties, employees, or individual respondents.

Table 1 – Characteristics of Hotel Clusters in Kazakhstan

Region	Type of tourism	Features of the hotel sector	Key areas of green practices
Almaty and Almaty Region	Urban and mountain resort tourism	Predominance of international hotel chains (Accor, Hilton, IHG)	Energy efficiency, waste reduction, corporate certification
Aktau (Mangistau Region)	Coastal, business and resort tourism	High energy consumption and water scarcity	Water conservation, solar energy, recycling
Burabai (Akmola Region)	Nature and recreational tourism	Mainly small hotels and guesthouses	Eco-management, biodegradable materials, local initiatives

Table 1 summarises the main characteristics of the three hotel clusters included in the study and highlights the differences in tourism profiles, hotel-sector structures, and priority areas of environmental management. These contextual differences provided the basis for selecting the case-study regions and informed the comparative analysis of green practices across Kazakhstan's hotel sector. The diversity of the selected clusters made it possible to examine how environmental initiatives are adapted to different geographical conditions, resource constraints, market structures, and tourism specialisations.

Building on this contextual framework, the following section presents the empirical findings of the study, focusing on the implementation of green practices, differences in their adoption across the three clusters, and their contribution to sustainable tourism development.

Results

The calculated Integrated Green Practices Index revealed pronounced heterogeneity across the three clusters. The obtained IGP values should be interpreted as comparative measures of the relative level of green-practice implementation across the analysed tourism clusters rather than as absolute indicators of environmental performance. Their primary purpose is to identify regional differences and priority areas for policy intervention. The sample-wide mean IGP stood at 68.4 points, placing Kazakhstan's hotel sector, on aggregate, in the upper portion of the medium band. However, these average masks considerable dispersion. In Almaty and the surrounding region, the mean IGP reached 82 points-firmly in the high category. Aktau recorded a mean of 74, hovering near the boundary between medium and high. Burabai, by contrast, registered only 58 points, a value that, while not critically low, signals a substantial gap relative to the other clusters.

These aggregate figures, however, are only partially informative. A closer look at the sub-index structure exposes qualitatively distinct greening profiles. In Almaty, the strongest sub-indices were energy saving (0.84) and waste management (0.79), driven largely by the corporate protocols of international chains operating in the city. Staff training scored 0.76, reflecting the structured onboarding and continuing-education programmes mandated by brands like Hilton and Accor. The weakest sub-index was sustainable transport (0.51), a dimension in which even high-end urban properties have limited leverage given the state of public transit and cycling infrastructure in Almaty.

Aktau presented a different pattern. Water conservation led with a sub-index of 0.82-unsurprising in a region where freshwater scarcity is an existential operational concern. Energy saving

was also strong at 0.77, buoyed by growing adoption of solar thermal systems for water heating and pool temperature regulation. Waste management (0.63) and procurement (0.59) lagged, reflecting both logistical challenges in a remote coastal city and the absence of mature local recycling markets.

In Burabai, no single sub-index exceeded 0.65. The strongest dimension was eco-management (0.64), encompassing informal practices such as biodegradable amenity kits, participation in seasonal clean-up campaigns, and cooperation with the Burabai National Park administration. Certification (0.31) was the lowest sub-index across the entire sample, as virtually no property in this cluster held a formal ISO 14001 or Green Key credential. The small scale and independent ownership typical of Burabai’s accommodation stock create structural obstacles to formal certification: cost, administrative complexity, and a perceived mismatch between international standards and local operating realities.

Table 2 – Integral Assessment of the Level of Green Practices Implementation by Region

Region	IGP, points	Main areas of greening	Avg. energy reduction, %	Certification rate, %	Typical barriers
Almaty and Almaty Region	82	Energy saving, waste management, staff training	10.2	18	High cost of certification
Aktau	74	Water conservation, solar energy, waste disposal	8.5	10	Shortage of technical specialists
Burabai	58	Eco-management, local initiatives, biodegradable materials	4.3	5	Limited funding, weak institutional support

The values presented in Table 2 represent regional averages calculated from the hotel-level IGP scores obtained for each tourism cluster. The reported values for average energy reduction and certification rate were derived from the empirical dataset used in this study and summarised at the regional level for comparative analysis. These regional averages were calculated across the full empirical sample of 34 hotels included in the study (15 in Almaty and Almaty Region, 10 in Aktau, and 9 in Burabai).

The results confirm a positive association between green-practice adoption and economic efficiency. According to interview data and publicly available hotel reports, properties scoring in the high IGP band reported average annual operating-cost reductions of 7–10%, a range consistent with findings from international studies on the resource-efficiency payoff of hotel greening [4; 19]. Consumer-loyalty indicators also tracked positively: hotels with declared sustainability programmes received higher ratings on Booking.com and TripAdvisor, corroborating earlier work by Luo and Tang [2] and Olya et al. [8].

In Almaty, the greening momentum is most visibly carried by international chains whose corporate mandates leave relatively little room for deviation. Public reports by Accor (Planet 21), Hilton (Travel with Purpose), and IHG (Green Engage) confirm that corporate environmental

standards are applied uniformly across brand properties, including those on the Almaty market [20; 22]. Information published on Booking.com and hotel websites indicates that a growing number of city hotels claim energy-efficient lighting, automated climate-control systems, waste-sorting infrastructure, and local-supplier support programmes. Whether these claims are consistently backed by verifiable performance data is a question that future research-ideally employing on-site audits-should address.

In Aktau, environmental initiatives concentrate on water-use optimisation and energy-efficiency improvement, two priorities dictated by the regional climate. Hotels in the resort zone report the deployment of water-saving fixtures, solar water heaters, and partial waste-recycling schemes. Some international chains operating in the region apply their global energy-management systems locally, though adaptation to Mangistau's extreme heat presents engineering challenges that are not fully resolved [22; 23].

In Burabai, green initiatives remain largely informal and piecemeal. The most commonly observed measures include biodegradable toiletry kits, seasonal participation in environmental campaigns organised by the national park, and opportunistic waste sorting. Despite the low rate of formal certification, several hotel operators expressed interest in pursuing Green Key accreditation if financial support and simplified procedures were available [21–23]. One guesthouse owner in Burabai articulated a perspective encountered repeatedly during fieldwork: “We do many things that would probably count as green, but we do them because they make sense, not because someone told us to fill out a checklist.” This sentiment captures the disconnect between lived practice and formal recognition that pervades the small-property segment.

A supplementary analysis of guest reviews on Booking.com provided an additional lens on the perceived impact of green practices. Among Almaty hotels with declared sustainability programmes, the average guest rating was 8.6 out of 10, compared with 8.1 for properties without such declarations. In Aktau, the corresponding figures were 8.3 and 7.8. In Burabai, the difference was statistically negligible (7.9 vs. 7.7), likely because fewer properties in this cluster make explicit sustainability claims visible to online bookers. While these correlations do not establish causation-higher-rated hotels may adopt green practices precisely because they are better managed overall-they suggest that environmental responsibility and guest satisfaction are at minimum co-occurring rather than conflicting attributes. This co-occurrence is consistent with large-scale platform-data research linking the presence of sustainability-related discourse in guest reviews to guest satisfaction outcomes across millions of Booking.com and TripAdvisor reviews [25], and aligns with subsequent work demonstrating that machine-learning models trained on review-platform data can predict a property's sustainability status with reasonable accuracy [28]-together suggesting that review-platform measures can serve as a complementary perceptual indicator, though not a substitute for audited environmental performance data.

Qualitative analysis of interview transcripts surfaced several cross-cutting themes. First, the presence of a dedicated sustainability officer or an explicit environmental clause in the management contract was the single strongest predictor of systematic green-practice adoption. Second, staff training emerged as both a facilitator and a barrier: hotels that invested in regular eco-training reported not only improved environmental performance but also higher employee engagement and lower turnover. Third, guest communication about green measures was frequently described as “awkward” or “risk-laden” by managers who feared that overt messaging might signal cost-cutting rather than genuine environmental commitment.

A fourth theme concerned the supply-chain dimension of greening. Managers in Almaty reported that sourcing locally produced food and amenities was straightforward given the city’s developed commercial infrastructure, but colleagues in Aktau described substantial logistical hurdles. Fresh produce, for instance, must often be transported over considerable distances to reach Mangistau, inflating both costs and the carbon footprint of procurement. In Burabai, the situation was paradoxically reversed: local dairy, honey, and seasonal fruit were readily available from nearby farms, yet hotels rarely formalised these relationships into structured sustainable-procurement programmes. The gap between informal local sourcing and documented sustainable procurement illustrates a recurring pattern in developing-country hospitality-practices may exist in substance but not in form, rendering them invisible to certification audits and composite indices alike.

A fifth observation relates to the role of guest nationality in shaping green-practice demand. Hotels in Almaty that cater predominantly to European and East Asian business travellers reported higher guest expectations regarding recycling, towel-reuse options, and electronic check-in. By contrast, properties in Burabai, whose clientele is overwhelmingly domestic, encountered limited explicit demand for green services-though managers noted that Kazakh tourists are increasingly receptive to nature-oriented messaging when it is framed not as “environmentalism” but as respect for the natural landscape and national heritage. This framing insight may prove actionable for destination marketers seeking to raise the profile of sustainability among domestic travellers.

Table 3 – Sub-Index Scores by Cluster

Sub-index	Almaty	Aktau	Burabai
Energy saving	0.84	0.77	0.52
Water conservation	0.78	0.82	0.55
Waste management	0.79	0.63	0.49
Certification	0.71	0.58	0.31
Staff training	0.76	0.64	0.48
Sustainable procurement	0.72	0.59	0.53
Guest communication	0.68	0.55	0.47
Sustainable transport	0.51	0.42	0.38

The sub-index values presented in Table 3 represent the weighted contribution of each sustainability dimension to the final Integrated Green Practices Index. All sub-indices were obtained after min-max normalisation of the original indicators followed by weighted aggregation using the AHP-derived coefficients described in the methodology.

Synthesising the quantitative and qualitative strands, the following generalisations emerge. The greening of Kazakhstan’s hotel sector is progressing, but at markedly uneven speeds. Almaty demonstrates the most mature environmental management, a status attributable primarily to the gravitational pull of international chains and their non-negotiable corporate standards. In Aktau, green practices are shaped principally by engineering necessity-water and energy constraints that leave hotels little choice but to innovate. In Burabai, greening remains sporadic, informal, and dependent on individual initiative rather than institutional scaffolding. The IGP index, for all its limitations, proves useful as a diagnostic and benchmarking instrument capable of exposing these structural asymmetries.

An examination of the certification landscape across the three clusters reinforces this picture of

unevenness. In Almaty, 18% of surveyed hotels held at least one formal environmental credential-predominantly ISO 14001 or a brand-internal equivalent. The figure drops to 10% in Aktau and a mere 5% in Burabai. These rates lag conspicuously behind European benchmarks, where Green Key alone certifies over 3,200 properties across 65 countries, and where national eco-label programmes have pushed formal certification rates above 30% in Scandinavian and Alpine destinations [5; 18]. The gap is attributable to multiple factors: the relative youth of Kazakhstan's tourism sector, the cost and complexity of international certification for independent operators, limited domestic demand for eco-labels, and the absence of a nationally recognised green-hotel standard that could serve as an entry ramp toward international accreditation. This pattern mirrors findings from an AHP-based study of certification reluctance among Taiwanese hoteliers, where low consumer demand for eco-labels and the absence of supportive policy were identified as the two highest-weighted barriers ahead of cost considerations [27]-suggesting that Kazakhstan's certification gap may be driven as much by demand-side and institutional factors as by the financial burden cited by interview respondents in this study.

The economic geography of greening also merits comment. Almaty's hotel market benefits from agglomeration effects: the concentration of international chains creates a competitive dynamic in which laggards are pressured to match the environmental claims of neighbours. The city's commercial infrastructure-waste-management companies, energy-audit firms, local food suppliers-provides the support ecosystem that greening requires. Aktau, by contrast, is a relatively isolated market where the limited number of properties reduces competitive pressure and where support-service providers are few. Burabai occupies a third configuration: a dispersed, seasonal market where hotels compete less with each other than with the option of not visiting the destination at all. In such a context, the incentive to invest in green practices-which yield returns over multi-year horizons-is structurally weaker than in a year-round urban market.

The question of who pays for greening is thus inseparable from where greening takes place. Policy interventions that treat the hotel sector as a homogeneous unit-offering uniform incentives or imposing blanket requirements-risk misallocating resources and alienating the very operators most in need of support. A geographically differentiated policy approach, with stronger subsidies and simplified compliance pathways for peripheral and seasonal destinations, would better reflect the structural realities revealed by this study.

Discussion

The findings of this study invite comparison with broader international patterns. In mature tourism economies-Western Europe, parts of East Asia, segments of the Caribbean-hotel greening have evolved from a voluntary marketing differentiator into a regulatory and market expectation. The European Union's revised Energy Performance of Buildings Directive, for instance, imposes binding energy-efficiency standards on commercial properties, including hotels [18]. In such regulatory contexts, IGP scores in the high band would not represent distinction but mere compliance. Kazakhstan's hotel sector, by contrast, operates in a regulatory environment where green requirements for accommodation facilities are essentially advisory. The national Concept for Transition to a "Green Economy" establishes broad aspirational targets but stops short of mandating specific performance thresholds for individual properties [11].

This regulatory vacuum has two consequences. On the one hand, it permits ambitious chains to differentiate themselves by voluntarily exceeding local norms-exactly what is observed in Almaty.

On the other hand, it provides no floor beneath which properties cannot legally fall, meaning that poorly performing hotels face no compulsion to improve. The gap between the top and bottom of the IGP distribution is therefore partly a story about institutional design: the absence of enforceable standards amplifies the advantage of well-resourced, brand-affiliated properties and leaves independent operators without a clear compliance pathway.

A second point of discussion concerns the relationship between green practices and guest perception. The interview data reveal a notable tension: managers recognise the marketing potential of sustainability credentials but fear that visible green measures-reduced towel laundering, water-saving reminders, energy-conscious lighting-may be interpreted by guests as cost-cutting in disguise. This anxiety is not unique to Kazakhstan; it surfaces in hospitality research across diverse markets [7]. The implication for policy and practice is that communication strategy matters as much as operational substance. Hotels that frame green practices as quality enhancements rather than austerity measures tend to elicit more favourable guest responses-a finding supported by both the interview data and the published literature [2; 9]. A conjoint-analysis study of online booking behaviour likewise found that green certification labels carry positive but modest weight relative to price and location, and that their influence strengthened after the COVID-19 pandemic [26]-consistent with the cautious, incremental approach to green-credential marketing observed among Kazakh hotel managers in this study.

Third, the pronounced weakness of the sustainable-transport sub-index across all three clusters merits attention. Even in Almaty, where public transit options exist, the overwhelming majority of hotel guests rely on private vehicles or ride-hailing services. Hotels have limited direct control over urban transport infrastructure, yet they can influence guest mobility through shuttle services, partnerships with e-scooter or bicycle-sharing operators, and provision of charging stations for electric vehicles. In Aktau and Burabai, the challenge is more fundamental: public transport is sparse, distances are large, and alternative mobility options are virtually non-existent. Addressing this sub-index will require coordination between hotel operators and municipal authorities-an area where current collaboration appears minimal.

Fourth, the study underscores a structural tension between international certification standards and local operating realities. ISO 14001 and Green Key, for all their analytical rigor, were designed with hotel markets in Europe and North America in mind. Application to the Kazakh context-particularly to small, family-run properties in Burabai-demands adaptation. Certification bodies might consider tiered or simplified accreditation tracks that lower the entry barrier without diluting the underlying environmental principles. Alternatively, national authorities could develop a Kazakh-specific eco-label that serves as a stepping stone toward international certification, as several Southeast Asian countries have done with programmes like the ASEAN Green Hotel Award.

The study is not without limitations. An additional limitation concerns the use of publicly available online reviews as supplementary evidence. Although approximately 1,800 reviews from 34 hotels across three tourism clusters were analysed, the review data were intended to complement the interpretation of the empirical findings rather than to serve as an independent quantitative dataset for calculating the Integrated Green Practices Index.

The sample of ten interviews, while sufficient for thematic saturation within each cluster, does not support statistical generalisation. The IGP index, though grounded in AHP-weighted expert assessment, would benefit from larger-scale validation against independently audited environmental performance data. Seasonal variability in hotel operations-particularly relevant in Burabai, where

occupancy is heavily concentrated in summer months-was not captured in the present analysis. Finally, the study draws exclusively on properties rated three to five stars; budget and unrated accommodation, which represents a significant share of the market, falls outside the scope.

A fifth consideration relates to the temporal dimension of greening. The snapshot approach employed in this study captures a single point on what is, by all accounts, a moving trajectory. Interview respondents in all three clusters reported that their environmental practices had evolved substantially over the preceding three to five years, and several anticipated further changes tied to upcoming regulatory developments or corporate-mandate updates. Longitudinal tracking of IGP scores-ideally at annual or biennial intervals-would enable researchers and policymakers to distinguish genuine progress from superficial “greenwashing,” a phenomenon whose prevalence in the global hotel industry has been documented by several authors [18; 2].

The role of digital technologies in mediating hotel greening also warrants attention. Smart building-management systems, real-time energy dashboards, and IoT-enabled water-monitoring devices are transforming how hotels track and optimise resource consumption. In Almaty, two international-chain properties reported deploying AI-driven climate-control systems that adjust room temperatures based on occupancy sensors and weather forecasts, yielding measurable energy savings. Such technologies remain out of reach for most independent operators, creating a digital divide that mirrors-and in some cases amplifies-the greening gap captured by the IGP index. Future research might profitably examine how digital infrastructure investment interacts with environmental performance across different hotel segments.

The mechanism by which hotel-level greening is expected to feed into sustainable tourism development at the destination scale deserves explicit statement, since the IGP index by itself measures only the input side of that chain. Three transmission channels can be distinguished. The first is economic: cost savings from energy and water efficiency are partly reinvested in local procurement and staff training, which in turn supports ancillary employment in food supply, maintenance, and tour-guiding services external to the hotel itself. The second is reputational: destination-level ratings on platforms such as Booking.com and TripAdvisor aggregate individual-property sustainability signals into a composite destination image that can influence inbound demand at the cluster level, not merely at the level of a single hotel. The third is infrastructural: hotel investment in waste-sorting, water-treatment, and low-emission transport partnerships creates spillover capacity-shared recycling contractors, shuttle networks-that lowers the marginal cost of greening for non-hotel tourism enterprises operating in the same destination. These channels are inferred from the interview and documentary material gathered for this study rather than independently measured at the destination scale; tracing their relative strength quantitatively-for example through input-output modelling of tourism-sector employment, or longitudinal destination-image analysis-constitutes a priority for follow-on research. The present study should accordingly be read as an assessment of the hotel sector as the most tractable entry point into this wider system, rather than as a direct measurement of sustainable tourism development as a whole.

Finally, it bears noting that the discussion of hotel greening in Kazakhstan cannot be divorced from the broader political economy of the country’s energy sector. Kazakhstan remains heavily reliant on fossil fuels for electricity generation, which means that even hotels with energy-efficient operations may carry a substantial indirect carbon footprint. The transition to renewable grid electricity-a process underway but far from complete-will ultimately determine whether operational efficiency gains at the hotel level translate into absolute emissions reductions at the national level.

Until this structural transition advances further, the environmental benefits of hotel-level green practices will remain partial, a reality that policymakers should acknowledge when interpreting IGP scores and similar metrics.

Conclusion

The introduction of green practices in Kazakhstan's hotel sector is gradually acquiring the character of a strategic modernisation vector rather than a peripheral corporate initiative. The Integrated Green Practices Index developed in this study enabled a structured, cross-regional comparison that revealed significant differences in environmental maturity-differences rooted not merely in the willingness of individual hoteliers but in the institutional, climatic, and structural conditions that surround them.

Almaty and its environs occupy the leading position, propelled by the operational disciplines of international chains and a tourism market large enough to reward sustainability investment. In these hotels, green practices are woven into management strategy and extend to staff training, supply-chain oversight, and community engagement, aligning with GSTC and UNWTO recommendations [1; 2; 24]. Aktau presents a technology-driven greening trajectory, dictated by the physical imperatives of aridity and intense solar exposure. Hotels there have embraced engineering solutions-water-saving systems, solar thermal installations, building-envelope improvements-that reduce costs while mitigating resource pressures, consistent with UNEP and WTTC guidance for arid-zone hospitality [3; 19]. Burabai remains at an early developmental stage, with isolated, informal initiatives that reflect entrepreneurial goodwill more than institutional mandate. Yet the region's rich natural endowment and the expanding domestic demand for eco-oriented leisure give it latent potential that targeted support could activate.

On the whole, the data confirm that higher environmental maturity correlates with tangible economic benefits: reduced operating costs, improved guest satisfaction scores, and a stronger brand image among environmentally attentive consumers. These findings are congruent with the international literature that positions green practices not as an altruistic expense but as an investment with measurable returns [3; 5; 19].

Beyond economics, green technologies contribute to what might be called the social infrastructure of sustainability: they foster environmental awareness among hotel employees, reinforce corporate-responsibility norms, and build trust among industry stakeholders. Over time, these softer effects may prove as consequential as the hard savings on utility bills, because they establish the cultural preconditions for the deeper systemic changes that genuine sustainability demands.

Several practical recommendations follow from the analysis. First, the development of a national green-hotel certification scheme-calibrated to Kazakh conditions yet aligned with international frameworks-would provide a common benchmark and reduce the information asymmetry that currently benefits large chains at the expense of independent operators. Such a scheme might adopt a tiered structure, with a basic entry level accessible to small guesthouses and progressively more demanding tiers for larger properties, thereby encouraging broad participation rather than confining certification to a corporate elite.

Second, targeted financial incentives, such as tax credits or subsidised audit programmes, could lower the adoption barrier for small and medium-sized hotels, especially in regions like Burabai where certification costs are prohibitive relative to revenue. International experience suggests that

matching-grant schemes-where the state co-finances a portion of the initial sustainability audit-can trigger a virtuous cycle in which early adopters demonstrate savings that motivate peers to follow suit.

Third, municipal governments in major tourism destinations should invest in the transport and waste-management infrastructure whose absence currently depresses the most lagging IGP sub-indices. Hotels cannot single-handedly solve urban mobility or municipal recycling deficits; these are public-goods challenges that require coordinated multi-stakeholder action. In Almaty, the ongoing expansion of the metro system and cycling infrastructure offers an opportunity for hospitality operators to partner with city authorities on last-mile connectivity solutions. In Aktau and Burabai, where such infrastructure is embryonic, even modest interventions-designated hotel shuttle routes, shared bicycle stations at resort zones-could meaningfully shift guest mobility patterns.

Fourth, professional development programmes in environmental management and guest communication should be integrated into hospitality curricula at universities and vocational training centres across the country. The interview data consistently pointed to a shortage of mid-level staff with both the technical knowledge and the soft skills needed to operationalise green strategies. A nationally coordinated training initiative, potentially co-funded by the Ministry of Tourism and international development agencies, could address this gap while simultaneously building a professional culture in which sustainability is normalised rather than treated as an exceptional add-on.

Fifth, the creation of a publicly accessible national database of hotel environmental performance-anonymised at the property level but disaggregated by region, star category, and ownership type-would enable ongoing monitoring, facilitate academic research, and provide policymakers with the evidence base needed to calibrate interventions. Several countries, including Austria, Sweden, and Thailand, have established such registries with measurable improvements in sector-wide transparency and accountability. Adapting this model to Kazakhstan's institutional context, perhaps housed within the National Statistics Bureau or Kazakh Tourism National Company, would represent a relatively low-cost, high-impact policy measure.

Sixth, regional tourism authorities should explore the potential of destination-level sustainability branding-marketing entire tourism zones, rather than individual properties, as environmentally responsible. A "Green Burabai" or "Sustainable Aktau Coast" brand, backed by collective commitments from participating hotels and supported by municipal infrastructure investments, could shift the competitive dynamic from individual property certification to collective destination identity. Such an approach has been successfully piloted in Alpine ski resorts and Balinese beach zones, where destination-level sustainability commitments have attracted environmentally conscious travellers who might otherwise have bypassed the region entirely.

The methodological framework and empirical results presented here can serve as a foundation for a national monitoring system of hotel environmental performance. Future studies could strengthen the proposed framework by expanding the empirical database, incorporating larger hotel samples, and validating the Integrated Green Practices Index using longitudinal observations and independently audited environmental performance data. They can also inform the design of practical guidelines aimed at stimulating green investment in the tourism sector. A promising avenue for further inquiry is the nexus between green innovation, digital transformation of hotel services, and the competitiveness of Kazakh tourist destinations-as well as a rigorous assessment of how sustainable hospitality practices contribute to the achievement of the UN Sustainable Development

Goals.

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<p>A. KALIYEVA PhD Student, Al-Farabi Kazakh National University, (Kazakhstan, Almaty) E-mail: kaliyeva.aida@kaznu.kz</p>	<p>A. AKTYMBAYEVA Candidate of Geographical Sciences, Professor, Al-Farabi Kazakh National University, (Kazakhstan, Almaty), E-mail: aliya.aktymbayeva@kaznu.edu.kz</p>
<p>A. SAPIYEVA PhD, Al-Farabi Kazakh National University, (Kazakhstan, Almaty), E-mail: akmaral.sapiyeva@kaznu.edu.kz</p>	<p>Y. DAULETKHANOVA PhD Student, Al-Farabi Kazakh National University, (Kazakhstan, Almaty) E-mail: daulethanova_e@mail.ru</p>
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A. КАЛИЕВА¹✉, А. АКТИМБАЕВА¹, А. САПИЕВА¹, Е. ДӘУЛЕТХАНОВА¹

¹Әл-Фараби атындағы Қазақ ұлттық университеті
(Қазақстан, Алматы), e-mail: kaliyeva.aida@kaznu.kz

ҚАЗАҚСТАНДАҒЫ ТУРИЗМНІҢ ТҰРАҚТЫ ДАМУЫНЫҢ ФАКТОРЫ РЕТІНДЕГІ ҚОНАҚ ҮЙ СЕКТОРЫНДАҒЫ ЖАСЫЛ ТӘЖІРИБЕЛЕР

Аңдатпа. Жаһандық тұрақты даму тұжырымдамасына көшу жағдайында қонақ үй индустриясы экологиялық бастамалар белсенді түрде енгізілетін негізгі салалардың біріне

айналуда. Зерттеудің мақсаты – өңірлік ерекшеліктер мен халықаралық экологиялық менеджмент стандарттарын ескере отырып, Қазақстандағы туризмнің тұрақты дамуына қонақ үй секторындағы жасыл тәжірибелердің ықпалын кешенді бағалау. Зерттеу ғылыми жарияланымдарға, халықаралық стандарттарға және қонақ үй компанияларының есептеріне мазмұндық талдау жүргізуге негізделген. Қонақ үйлерді экологияландырудың негізгі бағыттары мен құралдары айқындалып, халықаралық және ұлттық тәжірибе талданды, сондай-ақ негізгі кедергілер мен даму перспективалары анықталды. Зерттеу нәтижелері жасыл бастамаларды табысты енгізу стандарттау, мемлекеттік қолдау, инвестиция тарту және тұтынушылардың экологиялық санасын арттыруды қамтитын кешенді тәсілді талап ететінін көрсетеді. Зерттеудің практикалық маңызы – жаһандық тәжірибелерді Қазақстанның қонақ үй секторы жағдайына бейімдеу бойынша ұсыныстар әзірлеуде.

Кілт сөздер: жасыл бастамалар, қонақ үй индустриясы, тұрақты даму, энергия тиімділігі, экологиялық стандарттар, Қазақстан.

А. ҚАЛИЕВА¹✉, А. АКТЫМБАЕВА¹, А. САПИЕВА¹, Е. ДӘУЛЕТХАНОВА¹

¹Казахский национальный университет имени аль-Фараби
(Казахстан, Алматы), e-mail: kaliyeva.aida@kaznu.kz

ЗЕЛЕННЫЕ ПРАКТИКИ В ГОСТИНИЧНОМ СЕКТОРЕ КАК ФАКТОР УСТОЙЧИВОГО РАЗВИТИЯ ТУРИЗМА В КАЗАХСТАНЕ

Аннотация. В условиях глобального перехода к устойчивому развитию гостиничная индустрия становится одним из ключевых секторов активного внедрения экологических инициатив. Цель исследования заключается в комплексной оценке влияния зелёных практик в гостиничном секторе на устойчивое развитие туризма в Казахстане с учётом региональных особенностей и международных стандартов экологического менеджмента. Исследование основано на контент-анализе научных публикаций, международных стандартов и отчётов гостиничных компаний. Определены основные направления и инструменты экологизации гостиниц, проанализирован международный и национальный опыт, выявлены ключевые барьеры и перспективы развития. Результаты показывают, что успешная интеграция зелёных инициатив требует комплексного подхода, включающего стандартизацию, государственную поддержку, инвестиции и повышение экологической осведомлённости потребителей. Практическая значимость исследования заключается в разработке рекомендаций по адаптации глобальных практик к условиям гостиничного сектора Казахстана.

Ключевые слова: зелёные инициативы, гостиничная индустрия, устойчивое развитие, энергоэффективность, экологические стандарты, Казахстан.