Sustainability Indicators for Tourism Destinations in Georgia

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Abstract

The article examines the challenge of measuring the sustainability of tourism destinations in Georgia through the development of an indicator system that aligns the sector's economic growth with the preservation of natural and cultural capital. The swift post-pandemic recovery of tourism drives the relevance of the topic, the sector's substantial contribution to the country's GDP, and the mounting pressures on ecosystems and social structures—pressures that compel national policy to seek a balance between profitability and the conservation of the resource base. The study's aim is to systematize and adapt international framework documents—UNWTO SF-MST, ETIS, and GSTC-D v2.0—to the Georgian context to construct a four-cluster model of indicators: environmental, sociocultural, economic, and innovation-technological. The novelty of the work lies in combining GEOSTAT and GNTA statistics, corporate ESG reporting, crowdsourced monitoring, and data on cultural diplomacy and smart tourism, which together enable an integrated methodology for sustainability assessment. The key findings prove that the sustainability of tourism in Georgia cannot be measured through detached metrics. Only the simultaneous use of indicators of water and carbon footprints, waste recycling, structure of tourist expenditures, the contribution of small businesses, resident perceptions, and digital innovation can create an adequate picture. These results bring to the limelight distributed monitoring technologies and national digital platforms for sustaining the social legitimacy of tourism as well as protecting the country's competitive advantages. The article will be helpful for researchers in sustainable tourism, policymakers, regional administrations, and tourism industry stakeholders interested in the practical adaptation of global indicator systems to national and local specificities.

Keywords: *Sustainable Tourism, Georgia, Tourism Destinations, Sustainability Indicators, Cultural Diplomacy, Smart Tourism, Ecological Footprint, Social Perception.*

INTRODUCTION

At the cusp of post-pandemic recovery, tourism in Georgia has once again assumed the role of a fast engine of the macroeconomy: according to GEOSTAT estimates, the sector's direct value added reached 7,2 % of GDP in 2023, while the aggregate contribution (including multipliers) rose to 21,4 %—nearly every fifth lari in the economy (World Travel & Tourism Council, 2024). This dynamic is the result of three concurrent accelerations: the resumption of air connectivity, pent-up demand from European and Middle Eastern markets, and the expansion of the domestic traveler who filled the gaps during periods of border closures.

The arrivals curve corroborates this: in the second quarter of 2025 alone, the country hosted 1.6 million foreign guests, 7% more than a year earlier (BTU AI, 2025). The still-operative quantitative targets of the Government's Strategy-2025 promise 11 million visitors (Natia Taktakishvili, 2022). Government calculations have migrated this ambitious corridor into the programmatic documents Vision 2030,

where tourism appears as a driver of inclusive growth and regional convergence (EHH, 2022). The pace seems achievable, yet here the paradox emerges: the swifter the flows grow, the more palpable the pressure on ecosystems and cultural heritage—from the overburdened Kazbegi serpentines to the vulnerable Kakheti wine-growing terroirs.

The question how to grow without eating away the foundations of prosperity moves to the center of the discussion. A peaceful Caucasus, clean water, pastoral landscapes—these are precisely the assets that shape the value core of Georgia's tourism brand; their degradation would nullify the competitive edge faster than any price war. Hence, a pivot from quantitative records to qualitative indicators: carbon footprint per guest-night, seasonality coefficient, and level of engagement by local SMEs. In the Vision 2030 plans, these metrics are coupled with spatial planning reform and commitments to green investments, turning sustainability from an abstract mantra into measurable policy.

The key to equilibrating ambitions and constraints has been the concept of cultural diplomacy and smart tourism. In this reading, travel is an extended negotiating table, where the guest receives a personalized, technologically saturated experience, and the host side gains the opportunity to project soft power through gastronomy, folklore, and augmented reality digital guides (Razmadze, 2025). It is precisely the combination of deep local history and algorithmic convenience that offers a chance to transform the surge of tourism from a short-lived wave into a sustainable, regionally distributed sea that does not erode the shore but nourishes it with new forms of life.

MATERIALS AND METHODOLOGY

The materials and methodology of the study rest on a comprehensive analysis of statistical and regulatory sources covering the dynamics of Georgia's tourism sector and its socio-ecological consequences. The theoretical foundation contains international frameworks and standards regarding sustainable tourism. These include the UNWTO-led Statistical Framework for Measuring the Sustainability of Tourism, the European Tourism Indicators System, and the GSTC-D v2.0 standard, which sets methodological benchmarks in classifying indicators into four clusters: environmental, sociocultural, economic, and innovation-technological (UNWTO, 2024). In comparison with National Development Strategies (Vision 2030), those target indicators were identified that would reflect balances of tourist flow dynamics versus resource base preservation (EHH, 2022).

The empirical base comes from sample surveys and summed up GEOSTAT statistics about water consumption, energy use, and waste management by the hospitality industry (GeoStat, 2024b), as well as GNTA papers dealing with visit structure, tourist motivations, and seasonal variation in flows (GNTA, 2018). Also added were government forecasts on visitor numbers and economic returns (Natia Taktakishvili, 2022; World Travel & Tourism Council, 2024) that enable matching quantitative targets to sustainability metrics. To fine-tune environmental effects, data were sought from international organizations on average norms of water use and waste handling in the hotel sector (Made Blue Foundation n.d.), together with regional publications on waste management (Nechaev, 2025).

This study is based on three methods. First, by comparing international indicator systems and how they have been modified within the Georgian context, it will be possible to determine the degree of adjustment between global methodologies and local priorities. Second, a review of governmental and private data sources in a systematic manner. These include corporate ESG reports; social perception of tourism from mountaineer region inhabitants (Gogitidze et al., 2022); as well as AirGE network data, which registers air quality in tourist zones (Arnika, 2025). Third, content analysis of cultural diplomacy and smart-tourism initiatives, such as the deployment of digital guides and AR technologies (Razmadze, 2025; Jikidze, 2025), allowed

the integration of an innovation layer into the indicator system. This combined design ensured the comparability of heterogeneous data and imparted to the study the character of an interdisciplinary assessment of the sustainability of tourism destinations in Georgia.

RESULTS AND DISCUSSION

The international methodologies underpinning sustainability assessment in tourism—whether the UNWTO-sponsored Statistical Framework for Measuring the Sustainability of Tourism, which aligns indicators with sector-level accounting statistics, the European ETIS piloted across a hundred destinations, or the flexible yet normatively stringent GSTC-D v2.0—are similar in offering a multi-level set of metrics. Still, they diverge in stakeholder roles and the depth of binding obligations: UNWTO provides a system embedded within official statistics, ETIS focuses on self-assessment by local administrations, whereas GSTC places the destination into a mode of independent certifiable conformity (UNWTO, 2024). This polyphony, paradoxically, creates room for regional interpretation: it is precisely in this interstice that a four-cluster scheme wedges in, wherein environmental, sociocultural, economic, and innovation-technological vectors cohere into a single idea capable of turning a trip into a continuation of cultural dialogue rather than an excursion through resources (Jikidze, 2025).

The empirical component of the study takes up this matrix and draws heterogeneous sources into a single base: the quantitative scaffold is provided by GNTA and GEOSTAT sample surveys—the former record the structure of visits and guest behaviour, the latter measure water abstraction, energy consumption, and waste output by service enterprises—declaring that the methods are grounded in UNWTO recommendations and stratified household sampling (GeoStat, 2024b; GNTA, 2018). At the same time, the structure of trip motives shows the dominance of leisure (42,7 %), whereas business purposes (8,7 %) and medical/other (≤2,7 %) are secondary, with visits to relatives and transit together comprising another 36,8 % of the total share, as shown in Figure 1.
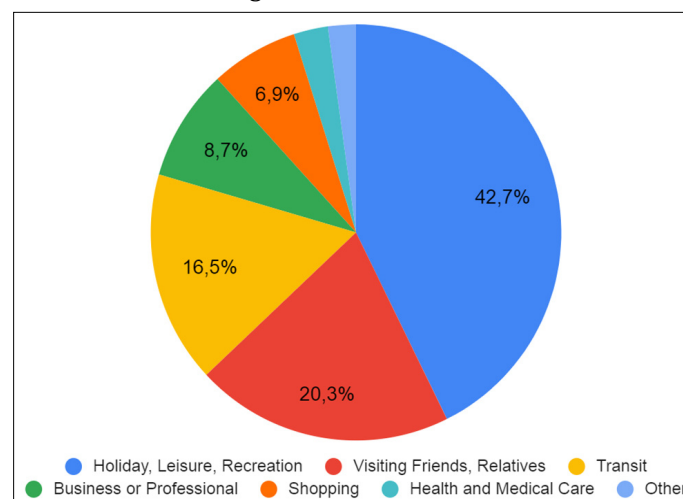

Fig. 1. Distribution of Trip Purposes in Georgia (GNTA, 2018)

At the level of the dense social context, regular resident surveys on quality of life in tourist areas are incorporated; business contributes ESG reporting, and the distributed AirGE network of civic sensors—which expanded over two years to a hundred stations—closes the gaps where governmental air or noise monitoring falters (Arnika, 2025). It is precisely this mixed, at points crowdsourced, design logic that makes it possible to perceive not only aggregates but also soft effects—for example, how a Saturday surge of traffic in Kazbegi correlates with a sharp spike in $PM_{2.5}$ and simultaneously with peaks in complaints from residents.

Within the environmental cluster, the water footprint becomes a primary marker, since high-mountain hydrological resources are already under pressure from irrigated agriculture: the average norm for the European hotel stock is estimated at 300 litres per guest-night (Made Blue Foundation, n.d.).

Waste and the zero waste model are captured by the utilization rate: the Sparklomat network grew from 58 to 200 machines in a year, and although this tripled the volume of recycled plastic, the overall share of landfill disposal still exceeds that of comparable Alpine resorts by a factor of two (Nechaev, 2025). The overload of protected areas is read from the billing data of the electronic ticketing system and a satellite step counter: as shown in Figure 2, in Q1 2024 the Prometheus Cave and Tbilisi National Park alone accounted for 43 % of all visits, underscoring seasonality and bottlenecks; management recommends a dynamic quota—reducing flow when the trail occupancy coefficient peaks during the rush hour (PMC, 2024).
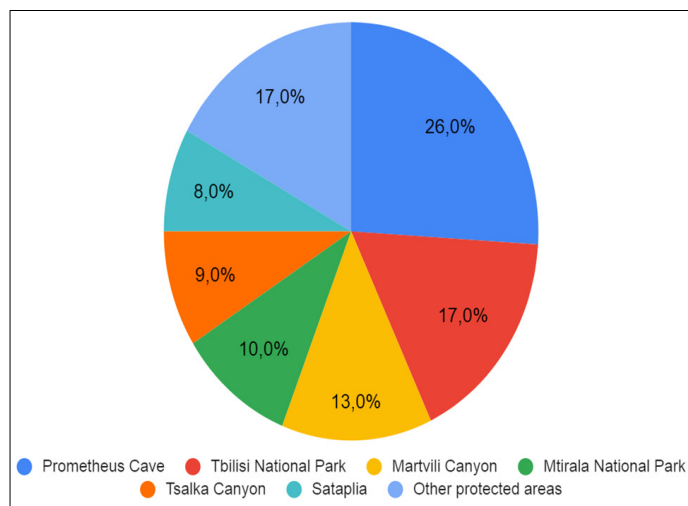
Fig. 2. Visitor Shares by Protected Area in Georgia in Q1 2024 (PMC, 2024)

Thus global frameworks, locally recalibrated indicators, and a polyphony of data are interwoven, enabling Georgian destinations to be seen not as a resource inventory but as a dynamic system in which sustainability is measured synchronously—in litres, particles, megawatt-hours and, more importantly, in the level of comfort of the residents who watch their landscape transform into a global living room.

By 2023 the labour landscape of Georgian tourism had manifested itself as a social shock absorber: the sector provided 492 000 jobs, that is, nearly every seventh employed person in the country; moreover, 27,9 % of all newly created jobs accrued to the travel industry, underscoring its critical significance for the regional labour market (World Travel & Tourism Council, 2024). Economic returns are distributed primarily in favour of micro-enterprises: according to the GEOSTAT digest, small businesses—chiefly family-run guesthouses, craft shops, and gastronomic cooperatives—account for 17,9 % of total business-sector turnover, forming a local demand multiplier and a reliable procurement channel for regional SMEs, as shown in Figure 3 (GeoStat, 2024a).
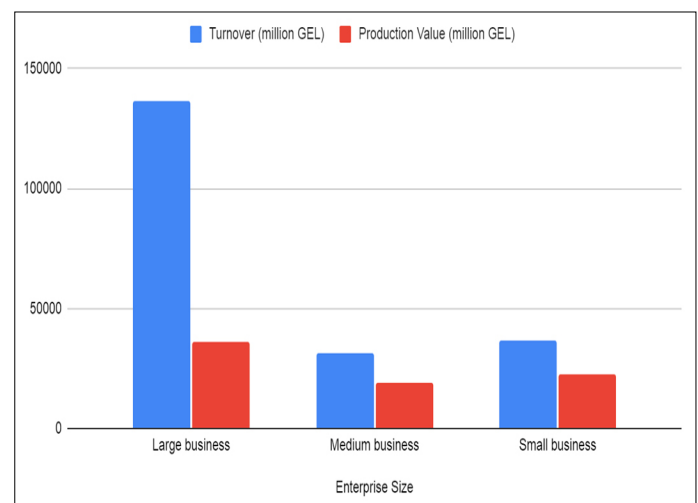
Fig. 3. Turnover and Production Value by Enterprise Size (GeoStat, 2024a)

Accordingly, two indicators—tourism-as-employer and the share of small enterprises in supply chains—constitute the basic linkage of socio-economic sustainability: they demonstrate that employment growth directly feeds the internal market circuit, minimizing capital leakage.

Sociocultural sustainability is composed of subtler yet measurable magnitudes. An online survey of 620 residents in the mountainous areas of Adjara showed that the integral assessment of the positive effect of tourism on local quality of life is 4,34 ± 0,55 on a five-point scale, whereas the negative impact index was recorded at only 2,16 ± 0,67, indicating a statistically significant preponderance of benefits over costs in the population's mass perception (Gogitidze et al., 2022). This asymmetry confirms the thesis that support for tourism among residents still retains a momentum of trust—and thereby creates a political window of opportunity for introducing stricter sustainability norms.

Financial flows for cultural heritage preservation concentrate around UNESCO mechanisms. Since 1992, Georgia has received 10 approved requests for international assistance totaling 220,940 USD, directed to the monitoring and restoration of four World Heritage properties, from the Gelati Monastery to the Colchic Rainforests (UNESCO, n.d.). An additional and more flexible instrument is the 2022 cash-for-work program in Mtskheta, where 20 young specialists

undertook paid practicums in monument conservation, closing the investment ↔ competence ↔ jobs cycle and thereby increasing the social return on heritage protection (UNESCO, 2022). Integrating such micro-projects into the broader restoration strategy makes it possible not only to sustain the material fabric of culture but also to expand local expertise, which is critical for the sector's long-term self-sufficiency.

Taken together, the four sub-cluster metrics—employment, local procurement, social approval, and cultural-investment inflows, as well as the normatively delineated accessibility timetable—form an interconnected system in which each element either amplifies or compensates another. This non-linear contour shows that the sustainability of Georgian tourism destinations is not reducible to a static checklist logic; on the contrary, it emerges as a dynamic matrix in which multiplicative effects across the economic, cultural, and social spheres coalesce into a single development trajectory.

The economic dimension of sustainability, continuing the logical arc from the sociocultural stratum, is revealed through the dynamics of tourist expenditures and the manner in which each lari-guest percolates through the micro-capillaries of the local economy. The visitor's wallet—until recently unambiguously directed toward the basics of lodging and food—today is progressively decomposed into a more variegated set of items: memories are packaged into tasting sets at family wineries; souvenir demand shifts toward designer collaborations with artisans; and the share of intangible services—be that polyphony master classes or tea-garden retreats—grows faster than the classic bed-breakfast-transfer model. This qualitative shift becomes an antidote to regional homogeneity: when gastronomic classes, high-mountain adventure trails, and cultural festivals are distributed across audience radars, the seasonality coefficient ceases to be dictated exclusively by the seacoast and begins to blur, allowing mountain municipalities to extend their income window beyond the short peak of sunlit months.

Where the tourist's basket meets the real producer, the question of leakage arises. The longer the chain of imports and middlemen, the more illusory the effect of presence; conversely, direct purchases from regional smallholders densify the circulation of money within the community, nourishing those very folklore ensembles and the road fund. In this context, not only cost but topology matters: if five hotels of varying scale consolidate and conclude a collective contract with an upper-valley cheesemakers' cooperative, each unit of expended resource closes its trajectory within the region instead of draining toward the wholesale warehouse nodes of the capital.

Wages and labour productivity complete the picture—two anchors keeping the socio-economic vessel on course. While average output per worker in tourism outstrips the agrarian sector yet trails light industry, the growth potential hides in cross-training: a cook who has mastered elementary demand analytics can not only optimise the menu but also create a new point of sale for gastro-experiences, thereby raising personal profitability. Skill, buttressed by digital literacy, becomes a multiplier that simultaneously elevates earnings and finely tunes service standards, bending upward the country's reputational curve.

Shifting layer, we move to the technological dimension. The backbone of any destination today is the fourth- and fifth-generation radio ether permeating even hard-to-reach gorges. Continuous coverage does more than stream images for the tourist's instantaneous storytelling; it also powers movement-density sensors that allow management companies to reroute traffic in real time from overburdened trails to less-visited routes, preserving fragile ecosystems. Hanging on these same network nerves is a growing ecosystem of smart points: quick-access codes, augmented reality with overlaid cultural commentary, and, at times, tiny humidity sensors beneath the trail decking that warn of landslide risk long before the human eye perceives it.

The digital storefront of small and medium suppliers is gradually shifting from global aggregators to national marketplaces where commissions are lower and ranking algorithms embody the principles of cultural diplomacy—for example, promoting those facilities that engage artisans from a neighbouring community and thereby multiply the local multiplier. As the booking flow passes through these platforms, a corpus of anonymized transactional data accumulates. This, in turn, becomes the feedstock for machine learning that forecasts demand surges with micro-season precision, hinting when to open additional flights and when to introduce soft quotas for national park visitation. Artificial intelligence trained not on abstract graphs but on concrete patterns of guest behaviour becomes the cognitive layer of management: it does not dictate complex rules, but winks to the manager that tomorrow the mountain settlement will be unexpectedly crowded and it is time to redeploy part of the volunteers from the interpretation center to the parking area to avoid bottlenecks and resident irritation.

The more digital tools are integrated, the more accurate price thresholds become, and so on, until small transactions turn into sustainable consumption, which makes the model itself sustainable. Spending money on sensor networks, augmented-reality interfaces, and domestic marketplaces is not a bet; it is an extension of the same logic that tries to keep every unit of value inside the regional ecology while liberating both natural and cultural resources from smothering hugs of unmanaged flows.

CONCLUSION

The post-pandemic expansion of Georgia's tourism sector—substantiated by its significant GDP contribution and the acceleration of guest inflows—confronts policy and management with a fundamental dilemma: how to preserve economic returns, grounded in employment and small business, without turning unique landscapes and cultural strata into an exhaustible resource. The answer flowing from the study does not reduce to simply curbing growth; instead, it proposes a transition to a multidimensional measurement

system—a four-cluster architecture in which environmental, sociocultural, economic, and innovation-technological indicators function as mutually reinforcing feedback channels: distribution of trip purposes, hotel water footprint, waste dynamics and utilization coefficients, investment flows into cultural conservation (UNESCO, cash-for-work), and metrics of local economic embeddedness—taken together, these yield a more adequate picture of sustainability than a set of disparate checklists.

Within this paradigm, digital and instrumental layers prove pivotal: from the distributed AirGE network and satellite monitoring to AR/QR smart points and predictive models trained on transactional data—technologies do not supplant managerial will, but endow it with pinpoint, high-frequency vision and the capacity for gentle, adaptive regulation of flows (dynamic quotas, flow redistribution, ranking of offerings on national marketplaces). Thus, the sustainability of Georgian destinations must be measured synchronously in litres, in particles, in megawatt-hours and, no less importantly, in the levels of resident comfort and approval; only by integrating these signals into spatial planning and investment commitments can short-term records be converted into long-term, territorially distributed prosperity that does not erode the very natural-cultural capital underpinning the country's competitive advantage.

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