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# Improving the Methodology for Integral Assessment of the Efficiency of State Regulation of Sustainable Development of the Tourism Sector

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**Abstract:** This article studies the theoretical and methodological aspects of an integrated assessment of the effectiveness of state regulation of the sustainable development of the tourism sector. It is based on the need to combine organizational, economic, institutional, social and environmental indicators that characterize the effectiveness of state regulation into a single assessment system. An improved algorithm for forming an integrated index is proposed by selecting, normalizing, grouping and aggregating indicators based on weight coefficients. This approach allows for a comprehensive assessment of the effectiveness of state regulation, identifying its strengths and weaknesses, and substantiating management decisions aimed at the sustainable development of tourism.

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**Keywords:** *tourism, sustainable development, state regulation, efficiency, integrated assessment, integrated index, indicator system, normalization, weight coefficient, management efficiency.*

## 1. Introduction

The tourism sector is a complex system that is inextricably linked with other sectors of the national economy, embodying economic, social, environmental and institutional processes. Therefore, ensuring its sustainable development requires taking into account the interrelationship between the strategic goals of state regulation, the means used and the results achieved [1]. In modern conditions, assessing the effectiveness of state policy only through separate economic indicators, such as the number of tourists, the volume of tourist services or the amount of investments, does not allow fully expressing the complex nature of regulatory processes in the tourism sector [2].

The concept of sustainable tourism, along with economic efficiency, provides for social benefits, rational use of natural resources, territorial balance and effective management. In international practice, there is also a growing need to assess the success of tourism development beyond the scope of traditional economic indicators [3]. In particular, the OECD emphasizes the need to develop a system of reliable, operational and policy-relevant indicators to measure the economic, social and environmental impacts of tourism in an interrelated manner and monitor the effectiveness of public policy [4].

One of the main methodological problems in assessing the effectiveness of state regulation of the sustainable development of the tourism sector is related to bringing indicators with different content and units of measurement to a single assessment criterion [5]. The high emphasis on economic indicators in current approaches, while insufficient

consideration of social, environmental and governance results, limits the comprehensiveness of the final assessment [6]. OECD analyses also note that economic indicators are relatively well-formed in sustainable tourism assessment systems, but gaps in data and indicators remain in some social and environmental areas [7].

This situation creates the need to determine the effectiveness of state regulation of tourism on the basis of a multi-criteria integrated assessment. An integrated approach allows systematizing indicators characterizing different areas, making them comparable, generalizing them based on appropriate weighting coefficients, and, as a result, expressing the effectiveness of state regulation through a single integrated index [8]. In this case, the task of the integrated index should not only be to form a general rating or numerical assessment, but also to determine which areas of the state regulatory system contribute to sustainable development in a high and which ones contribute relatively little [9].

At the same time, in the formation of an integrated assessment methodology, it is important not to artificially increase the number of indicators, but rather to ensure their compliance with the goals of state policy, statistical reliability, measurability and effectiveness. In international experience, the use of a limited set of indicators that are practically measurable and directly respond to political priorities is also recognized as an effective approach [10].

Based on this, an important scientific and methodological task in assessing the effectiveness of state regulation is to combine organizational, economic, institutional, social and environmental aspects within a single methodological system, take into account the stimulating and restrictive properties of indicators, normalize them and aggregate them through justified weight coefficients. Such an approach allows for a comprehensive assessment of not only the current results of regulatory measures implemented by the state, but also their impact on the sustainable development of the tourism sector [11].

The issues of assessing the effectiveness of state regulation of sustainable development of the tourism sector have been studied in foreign scientific literature within the framework of sustainable tourism, tourism policy, public administration, indicator systems and integrated assessment approaches. The generalization of scientific views in this area shows that when assessing the effectiveness of state regulation, it is necessary to take into account not only economic results, but also social, environmental, institutional and management factors [12].

B. Bramwell and B. Lane assess the coordination between the state, the private sector and other stakeholders as an important factor in managing sustainable tourism. In their research, the effectiveness of sustainable tourism development policies is associated with governance institutions, cooperation mechanisms and the participation of stakeholders in the decision-making process. This approach justifies the need to take into account not only economic results, but also management and institutional indicators when assessing the effectiveness of state regulation [13].

C.M. Hall analyzes the role of the state in the study of tourism policy and management through various governance models, emphasizing that the effectiveness of state policy depends on the interaction of governance structures, relationships between institutions, and policy instruments. The author's approach creates a theoretical basis for separating institutional and organizational effectiveness as separate assessment blocks when assessing the effectiveness of state regulation of tourism [14].

R. Sharpley analyzes the theoretical connection between sustainable tourism and sustainable development, showing the complexity of achieving long-term sustainability in conditions where the economic benefits of tourism are not balanced with environmental and social goals. In this regard, it is not enough to assess the effectiveness of state regulation only through tourist flows, the volume of services, or income indicators; the assessment system should cover the economic, social, and environmental results of tourism development in an interconnected manner [15].

C. Hunter interprets sustainable tourism not as a fixed and unchanging state, but as a paradigm that adapts to the development conditions of regions, tourist loads, and resource capabilities. This view suggests that, rather than mechanically applying the same criteria to all indicators in an integrated assessment system, it is necessary to take into account the content of the indicators and the direction of their impact on sustainable development.

The formation of a system of indicators has developed as a separate direction in research on the quantitative assessment of sustainable tourism. A. Torres-Delgado and F. López Palomeque focus on the practical application of indicators in the assessment of sustainable tourism, their relevance to territorial characteristics and their connection with tourism policy. Their research indicates the need to form a system of multi-criteria indicators for assessing sustainable tourism. In this case, it is not a simple statistical set of indicators, but the logical connection between them and their ability to express the final sustainability results that is important.

The approach of the OECD and the European Commission to the methodology for forming integral and composite indices is of particular scientific and methodological importance. According to him, the process of forming a composite indicator should include sequential steps such as defining the theoretical basis, selecting indicators, analyzing data, normalizing, weighting, aggregation, and checking the stability of the results. This approach ensures methodological consistency when combining indicators expressed in different units of measurement into a single index.

The Statistical Framework for Measuring the Sustainability of Tourism (SF-MST), developed by UN Tourism and the UN, forms an international conceptual framework for the statistical assessment of tourism sustainability in its economic, social and environmental dimensions. This approach establishes the need to take into account, in a single measurement system, not only the economic results of tourism, but also its impact on society and the environment. This serves as an important methodological basis for selecting outcome indicators in the formation of an integrated index of the effectiveness of state regulation.

Modern OECD studies on tourism policy also note the need to assess the success of tourism in a broader context than traditional indicators such as the number of tourists and economic revenues. In this regard, it is important to monitor aspects such as the impact of tourism on local communities, environmental consequences, territorial and seasonal distribution of tourist flows, and management effectiveness.

A summary of the analyzed scientific approaches shows that existing studies have sufficiently developed the methodology for the formation of sustainable tourism indicators, tourism policy and management, institutional mechanisms, and composite indices. However, it is precisely the issue of assessing the effectiveness of state regulation of the sustainable development of the tourism sector through a single integrated index that combines organizational, economic, institutional, social, and environmental results that requires special methodological improvement.

## 2. Materials And Methods

The study uses the methods of systematic and comparative analysis, statistical grouping, index, normalization, weighting and integral assessment. Indicators assessing the effectiveness of state regulation are divided into organizational, economic, institutional, social and environmental blocks, and indicators in different units of measurement are normalized in the range of 0–1. Then, based on the weight coefficients, private indices and a general integrated efficiency index are calculated. Such a sequence corresponds to the recognized methodological principles of forming composite indices.

## 3. Results

The Assessing the effectiveness of government regulation in ensuring the sustainable development of the tourism sector requires a multidimensional approach. This is because the outcomes of government regulatory measures are reflected not only in the growth of tourism services but also in the development of tourism infrastructure, improvement of the institutional environment, expansion of employment, enhancement of entrepreneurial activity, and rational use of natural resources. Therefore, it is appropriate to move from the assessment of individual indicators towards an integrated assessment that combines them within a unified methodological framework.

In this study, it is proposed to classify the indicators used to assess the effectiveness of government regulation of sustainable tourism development into organizational, economic, institutional, social, and environmental dimensions. Such an approach makes it possible to incorporate not only economic outcomes but also the institutional and organizational performance of public administration, as well as the social and environmental effects of tourism development, within a single assessment framework.

**Table 1.**

**System of indicators for the integrated assessment of the effectiveness of government regulation of sustainable tourism development**

| Assessment dimension | Key indicators | Assessment focus | Direction |
|---|---|---|---|
| **Organizational (O)** | development of tourism infrastructure; implementation of government programmes; regional governance and monitoring | Organizational effectiveness of public administration | + |
| **Economic (Ec)** | tourism industries output; tourism services; investment; tourism consumption; entrepreneurial activity | Economic effectiveness of government regulation | + |
| **Institutional (Inst)** | activity of tourism entities; public-private partnerships; digital public services; institutional cooperation | Effectiveness of the institutional environment for tourism development | + |
| **Social (S)** | employment in tourism industries; jobs created; involvement of local communities in tourism activities | Social effectiveness of tourism development | + |
| **Environmental (En)** | efficient use of resources; compliance with environmental requirements | Environmental sustainability | + |
| | waste generation; environmental pressure caused by tourism activities | Negative environmental impact | – |

The indicator system presented in Table 1 is distinguished by its ability to assess government regulatory effectiveness beyond individual economic outcomes by incorporating both the conditions under which regulatory measures are implemented and their final sustainability effects. In this framework, the organizational and institutional dimensions characterize the enabling conditions of government regulation, the economic

and social dimensions reflect its outcomes, while the environmental dimension captures the extent to which these outcomes comply with sustainability requirements.

When constructing an integrated index, indicators expressed in different units of measurement cannot be directly aggregated. Therefore, the direction of influence of each indicator is first identified, after which the indicators are normalized to a common 0-1 scale.

For stimulant indicators:

$$Z_{ijt} = \frac{X_{ijt} - X_j^{min}}{X_j^{max} - X_j^{min}}$$

For destimulant indicators:

$$Z_{ijt} = \frac{X_j^{max} - X_{ijt}}{X_j^{max} - X_j^{min}}$$

Where $Z_{ijt}$ is the normalized value of the indicator; $X_{ijt}$ is the actual value of indicator $j$ in period $t$; and $X_j^{min}$ and $X_j^{max}$ represent the minimum and maximum values of the respective indicator over the assessment period.

As a result of normalization, all indicators are transformed into a common interval ranging from 0 to 1. A value approaching 1 indicates relatively high effectiveness, whereas a value approaching 0 indicates relatively low effectiveness.

At the next stage, a partial index is calculated for each assessment dimension:

$$I_{kt} = \sum_{j=1}^{n} w_{kj} Z_{ijt}, \quad \sum_{j=1}^{n} w_{kj} = 1$$

Where $I_{kt}$ represents the partial index of dimension $k$ in period $t$, while $w_{kj}$ denotes the weight assigned to the respective indicator.

One of the key methodological issues in integrated assessment is the determination of indicator weights. Assigning weights solely on a subjective basis may lead to excessive dependence of the final index on the researcher's judgement. Therefore, this study proposes combining expert-based and objective statistical weighting:

$$w_j = a w_j^{(e)} + (1 - a) w_j^{(0)}$$

Where $w_j^{(e)}$ represents the weight obtained through expert assessment, $w_j^{(0)}$ denotes the weight determined using an objective statistical method and $a$ is a coefficient regulating the balance between the two approaches.

The overall integrated index is then calculated as follows:

$$I_{GR,t} = W_O I_{O,t} + W_{Ec} I_{Ec,t} + W_{Inst} I_{Inst,t} + W_S I_{S,t} + W_{En} I_{En,t}$$

Where $I_{GR,t}$ represents the integrated index of the effectiveness of government regulation of sustainable tourism development in period $t$; $I_O, I_{Ec}, I_{Inst}, I_S$ and $I_{En}$ denote the

organizational, economic, institutional, social, and environmental partial indices, respectively.

**Table 2.**

**Improved algorithm for the integrated assessment of the effectiveness of government regulation in tourism**

| Stage | Procedure | Result |
|---|---|---|
| **1** | Selection of policy-relevant indicators | System of indicators |
| **2** | Classification of indicators into functional dimensions | O, Ec, Inst, S and En dimensions |
| **3** | Identification of stimulants and destimulants | Direction of influence |
| **4** | Normalization of indicators | Values within the 0–1 interval |
| **5** | Combination of expert and objective weights | Methodologically justified weights |
| **6** | Calculation of partial indices | (I_O, I_{Ec}, I_{Inst}, I_S, I_{En}) |
| **7** | Aggregation of partial indices | Integrated index (I_{GR}) |
| **8** | Diagnosis and interpretation of results | Targeted policy decisions |

The principal advantage of the proposed algorithm is that the integrated index can be used not merely as a statistical aggregation tool but also as a diagnostic instrument for public policy. In addition to the final integrated value, the partial indices are retained, making it possible to identify which component constrains the overall effectiveness of government regulation.

To examine the practical applicability of the proposed approach, data from the Tourism Satellite Account available through the SIAT system of the National Statistics Committee of the Republic of Uzbekistan were used. The Tourism Satellite Account provides an internationally comparable statistical framework for analysing the economic contribution and structure of tourism.

**Table 3.**

**Dynamics of tourism industries output in Uzbekistan, 2020-2024**

| Indicator | 2020 | 2021 | 2022 | 2023 | 2024 | 2024/2020 |
|---|---|---|---|---|---|---|
| **Tourism industries output, UZS billion** | 88,698.7 | 122,255.8 | 174,441.0 | 228,448.0 | 286,682.1 | **3.23 times** |

The data presented in Table 3 indicate that tourism industries output increased 3.23 times between 2020 and 2024, rising from UZS 88.7 trillion to UZS 286.7 trillion. The continuous increase observed from 2021 onwards reflects a substantial expansion in tourism-related economic activity. However, since the indicator is expressed at current prices, this increase should not automatically be interpreted as an equivalent improvement in real regulatory effectiveness. This methodological limitation further supports the need to complement economic indicators with social, institutional, organizational, and environmental measures within an integrated assessment framework.

From the perspective of sustainable tourism development, it is also important to assess whether economic expansion is translated into social outcomes. For this purpose, selected employment indicators across tourism industries were analysed.

**Table 4.**

**Selected employment indicators in tourism industries in Uzbekistan, 2020-2024, persons**

| Tourism activity | 2020 | 2021 | 2022 | 2023 | 2024 | 2024/2020, % |
|---|---|---|---|---|---|---|
| **Accommodation services** | 49,805 | 51,524 | 53,451 | 59,955 | 69,016 | **138.6** |
| **Food and beverage serving services** | 54,101 | 67,946 | 73,111 | 78,415 | 93,721 | **173.2** |
| **Rail passenger transport** | 4,149 | 5,117 | 5,104 | 4,652 | 4,918 | **118.5** |
| **Road passenger transport** | 50,206 | 48,166 | 45,906 | 32,703 | 30,645 | **61.0** |
| **Air passenger transport** | 1,592 | 2,021 | 1,779 | 2,722 | 3,563 | **223.8** |
| **Travel agencies and reservation services** | 2,525 | 2,410 | 3,103 | 4,184 | 9,931 | **393.3** |

Table 4 demonstrates that the economic expansion of tourism has not produced uniform employment effects across all tourism-related activities. Between 2020 and 2024, employment in accommodation services increased by 38.6%, while employment in food and beverage serving services rose by 73.2%. Employment in air passenger transport more than doubled, reaching 223.8% of its 2020 level. The most substantial increase was observed in travel agencies and reservation services, where employment rose from 2,525 to 9,931 persons, representing approximately a 3.93-fold increase.

In contrast, employment in road passenger transport declined from 50,206 persons in 2020 to 30,645 persons in 2024, representing only 61.0% of the 2020 level. This structural divergence leads to an important analytical conclusion: overall economic growth in tourism industries does not necessarily imply an equivalent improvement in social effectiveness across all components of the tourism system. Consequently, assessing government regulatory effectiveness solely through aggregate economic indicators may conceal structural imbalances.

The structural dynamics of tourism output provide further evidence of this transformation. Growth in accommodation, food services, travel agencies, passenger transport, and other tourism-related activities indicates that the economic effects of tourism are distributed unevenly across different segments. Therefore, an integrated methodology should not only capture aggregate growth but also identify whether improvements are balanced across the dimensions of sustainable development.

Under the proposed methodology, the integrated index takes values between 0 and 1. To facilitate its interpretation from a public management perspective, the following conditional scale is proposed.

**Table 5.**

**Proposed criteria for interpreting the integrated index of government regulation effectiveness**

| Integrated index | Effectiveness level | Policy interpretation |
|---|---|---|

| | | |
|---|---|---|
| **0.00-0.20** | Very low | Comprehensive revision of the regulatory system is required |
| **0.20-0.40** | Low | Targeted measures are required for weak components |
| **0.40-0.60** | Moderate | Positive results exist, but selected dimensions require improvement |
| **0.60-0.80** | High | Regulatory mechanisms are largely effective |
| **0.80-1.00** | Very high | Balanced and sustainable regulatory effectiveness has been achieved |

The thresholds presented in Table 5 should not be interpreted as universal normative standards. Rather, they constitute an author-developed interpretative scale designed to facilitate managerial interpretation of integrated assessment results. As the empirical database expands, these thresholds may subsequently be refined through cluster analysis, quantile-based classification, or expert assessment.

An important advantage of the proposed methodology is that the final integrated index is analysed together with its underlying partial indices:

$$I_{GR} \longleftrightarrow \{I_O;\ I_{Ec};\ I_{Inst};\ I_S;\ I_{En}\}$$

This relationship enables the integrated assessment to perform two complementary functions. First, its assessment function determines the overall effectiveness of government regulation. Second, its diagnostic function identifies comparatively weak dimensions and thereby indicates where regulatory instruments and public resources should be prioritised.

For example, a high value of the economic index IEc accompanied by a relatively low environmental index IEn should not automatically be interpreted as a high level of sustainable regulatory effectiveness. Similarly, strong economic and social outcomes combined with a weak institutional index may indicate deficiencies in governance, coordination, digitalisation, or public-private interaction. Therefore, the profile of partial indices provides additional information that cannot be obtained from the aggregate index alone.

**Table 6.**

**Comparative characteristics of traditional and proposed approaches to assessing the effectiveness of government regulation in tourism**

| Criterion | Traditional approach | Proposed approach |
|---|---|---|
| **Object of assessment** | Individual statistical outcomes | Comprehensive effectiveness of government regulation |
| **Scope of assessment** | Predominantly economic | Organizational, economic, institutional, social and environmental |
| **Measurement** | Different measurement units | Normalized to the 0–1 interval |
| **Direction of influence** | Not always explicitly considered | Stimulants and destimulants are distinguished |
| **Weighting** | Equal or predominantly subjective | Combination of expert and objective statistical weights |

| | | |
|---|---|---|
| **Final result** | Separate indicators | Partial indices and an overall integrated index |
| **Primary function** | Description of the current situation | Assessment, diagnosis and policy decision support |

As shown in Table 6, the methodological contribution of the proposed approach extends beyond combining individual indicators into a single index. Its principal distinction lies in integrating the conditions, outcomes, and sustainability effects of government regulation within a unified analytical framework, explicitly accounting for the direction of indicator influence and using the final assessment for policy diagnosis.

Based on the analysis, an improved methodological sequence for assessing the effectiveness of government regulation of sustainable tourism development is proposed:

government policy objectives → selection of indicators → classification into O, Ec, Inst, S and En dimensions → identification of stimulants and destimulants → normalization → combined weighting → partial indices → integrated index → component diagnosis → targeted policy decisions.

The scientific novelty of the study lies in improving the methodology for assessing the effectiveness of government regulation of sustainable tourism development through a two-level integrated assessment encompassing organizational, economic, institutional, social, and environmental dimensions; normalization of indicators according to their stimulant or destimulant characteristics; combination of expert-based and objective statistical weighting; and diagnosis of the structural sources of the final result through partial indices.

The empirical evidence indicates that Uzbekistan's tourism sector experienced substantial economic expansion during 2020–2024, while employment dynamics varied considerably across individual tourism activities. This finding demonstrates that aggregate economic growth alone cannot fully characterize the sustainable effectiveness of government regulation and supports the need for a multidimensional assessment framework.

Thus, the empirical analysis confirms the practical applicability of the economic and social dimensions of the proposed methodology using official statistical data. The developed sequence — "indicator selection → classification into functional dimensions → identification of the direction of influence → normalization → combined weighting → construction of partial indices → integrated assessment → diagnosis → policy decision" — provides a methodological transition from the assessment of individual outcomes towards a comprehensive evaluation of government regulatory effectiveness. The practical significance of the proposed methodology lies not only in generating an overall integrated index, but also in identifying comparatively weak components through partial indices, thereby enabling policymakers to formulate targeted regulatory measures and strengthen the contribution of government regulation to the sustainable development of the tourism sector.

## 5. Conclusion

The study confirms that the road transport services market is one of the most dynamically developing segments of Uzbekistan's service economy. During 2016-2025, the sector demonstrated an overall positive trajectory despite the significant disruption in 2020. In 2025, total transport services reached approximately UZS 188.3 trillion and road transport services approximately UZS 95.9 trillion, representing 50.9% of the market. The road transport services growth rate reached 114.2%, compared with 110.8% for transport services overall. At the same time, regional analysis reveals significant territorial disparities. Therefore, further market development requires a transition from predominantly quantitative expansion toward a comprehensive model integrating infrastructure modernization, territorial accessibility, service quality, digitalization, multimodal connectivity and competitive market mechanisms. The principal scientific implication is that the development of the road transport services market should be assessed simultaneously through dynamic, structural and territorial dimensions. This approach provides a more comprehensive understanding of market transformation and supports targeted regional transport policy.

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