



Article

Spatial Distribution of Tourism Infrastructure in Jizzakh Region: Structural-Component Analysis and Assessment of Regional Disparities

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Abstract: The article analyses the spatial distribution of tourism infrastructure in Jizzakh region using a structural-component approach and quantitatively assesses regional disparities in its development. The relevance of the study stems from the rapid growth of tourist flows to the region and the uneven distribution of tourism infrastructure across its districts. The aim of the study is to determine the level of disparities in the location of infrastructure facilities and to develop proposals for reducing them. The analysis was carried out for 12 districts and Jizzakh city using data from the regional statistics department, the regional administration and the Directorate of the Zaamin tourist and recreational zone; infrastructure indicators for 2025 were determined through two-scenario estimation. The disparity coefficient, the Gini coefficient, the Lorenz curve, and the Theil and Herfindahl–Hirschman indices were applied. The results show that infrastructure is more strongly concentrated than tourist flows: in 2025, the Gini coefficient was 0.716–0.746 for accommodation beds, compared with 0.522 for tourist flows. Jizzakh city and Zaamin district account for 74.8–78.5 percent of all beds, while four districts have no registered accommodation facilities. Forish, Bakhmal and Arnasay districts face an infrastructure shortage despite high tourist flows. In 2024–2025, the regional concentration of tourist flows also increased (the Theil index rose from 0.368 to 0.503), owing to the growth of Zaamin district's share from 23.9 to 35.7 percent. Based on the findings, proposals are developed to expand accommodation facilities in deficit districts, broaden the coverage of investment incentives, and extend the impact of the Zaamin zone to neighbouring districts.

Keywords: Tourism infrastructure; infrastructure concentration; accommodation facilities; disparity coefficient; scenario-based estimation.

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1. Introduction

In recent years, tourism has become one of the fastest-growing sectors of the economy of Uzbekistan. International research shows that tourism stimulates regional economic growth by generating foreign exchange earnings, employment and demand for local production. According to preliminary data from the National Statistics Committee, 11.7 million foreign citizens visited the country for tourism purposes in 2025. This figure exceeds the 2024 level by 3.7 million, or 46.8 percent, and is the highest in the country's history [1].

The legal framework for the development of the sector is set out in the Law "On Tourism". Presidential Decree No. PF-87 of 15 May 2025 established measures to increase

the role of tourism in the economy in 2025–2026 by sharply increasing tourist flows and rapidly expanding the scope of tourist services.

A document of particular importance for Jizzakh region is Presidential Decree No. PF-6201 of 6 April 2021, under which the Zaamin tourist and recreational zone (TRZ) and its directorate were established. Resolution No. 254 of the Cabinet of Ministers of 28 April 2021 approved the boundaries of the zone, the Suffa Plateau 2400 international all-season resort and the O'rikli soy tourist complex, the concept for the zone's development, and a programme for developing its road, transport, engineering and communication infrastructure. Investment projects with a total value of UZS 4,851.0 billion are planned within the zone [2].

As a result of state policy, tourist flows to the region have increased considerably. According to the regional administration (khokimiyat), the number of tourists rose from 1,320,774 in 2023 to 2,195,689 in 2025, an average annual growth of 28.9 percent. Over the same period, the number of foreign tourists increased from 144,201 to 512,579. The region has rich natural and recreational resources, including the Zaamin mountain forest area and national park, the mountainous areas of Bakhmal district, and the Aydar–Arnasay lake system. In July 2025, plans were announced to build a modern tourism centre on the shore of the Aydar–Arnasay lake system [3].

However, the growth of tourist flows has not ensured a territorially balanced development of tourism infrastructure. According to the regional statistics department, 76 accommodation facilities with 3,429 beds operated in the region in 2024. Of these beds, 72.8 percent are located in Jizzakh city and Zaamin district alone. Jizzakh city accounted for 85.3 percent of guests in hotel-type facilities, while 11 of the 16 travel agencies were located in Forish district. At the same time, no accommodation facilities were recorded in Dustlik, Zarbdor, Zafarobod or Paxtakor districts. Across the region, there are only 1.85 beds per 1,000 tourists (author's calculation) [4].

In the scientific literature, tourism infrastructure, understood as the set of accommodation facilities, transport, catering, tour operator services and recreational facilities, is recognised as one of the key factors of tourist destination competitiveness. Consequently, a location of infrastructure facilities that does not match tourist flows prevents a region from fully realising its tourism potential and deepens socio-economic gaps between districts.

Existing studies on tourism in Jizzakh region mainly describe the region's tourism resources, attractions and accommodation facilities. However, there is a lack of research that comprehensively assesses tourism infrastructure by component and by district in comparison with tourist flows, using quantitative indicators such as the disparity coefficient and concentration and inequality indices. This research gap determines the relevance of the study [5].

The aim of the study is to analyse the location of tourism infrastructure in Jizzakh region from a structural-component perspective, to quantitatively assess the level of regional disparities in its development, and to develop scientific and practical proposals for reducing them.

Research hypothesis: tourism infrastructure facilities in Jizzakh region are more strongly concentrated than tourist flows and are located mainly in the regional centre and Zaamin district, while several districts with high tourist flows experience an infrastructure shortage.

This paper addresses these issues through three research questions: (RQ1) How are tourist flows and tourism infrastructure facilities distributed across the districts of Jizzakh region? (RQ2) To what extent does the territorial distribution of infrastructure correspond to the distribution of tourist flows? (RQ3) How does the Zaamin tourist and recreational zone affect the concentration of tourism infrastructure within the region?

The study contributes in three ways. First, it proposes a structural-component model of tourism infrastructure and a disparity coefficient that compares the distribution of infrastructure directly with the distribution of tourist demand. Second, it provides district-level evidence on the concentration of tourism infrastructure in Jizzakh region using the Gini, Theil and Herfindahl–Hirschman indices, supplemented by a two-scenario estimation for 2025. Third, it examines the Zaamin tourist and recreational zone as a state-created growth pole and quantifies its potential effect on intra-regional concentration [6].

The concept and composition of tourism infrastructure

The concept of tourism infrastructure is interpreted differently in the scientific literature. E. Inskeep distinguishes two groups of elements in tourism planning: tourist facilities and services (accommodation, catering, tour operator and other services) and general infrastructure (transport, water supply, energy, communications and other engineering systems). According to this approach, the development of a tourist destination requires a balanced formation of both groups of elements.

In the destination competitiveness model of J. R. B. Ritchie and G. I. Crouch, infrastructure, accessibility and hospitality are included among the “supporting factors and resources”. In this model, infrastructure is treated as a condition that makes it possible to use tourism resources: even where resources exist, a region’s tourism potential cannot be fully realised without adequate infrastructure.

Local studies also treat tourism infrastructure as a multi-component system. F. Ismoilova classifies tourism infrastructure as an interrelated system consisting of transport, hotel, entertainment and recreational, and information technology infrastructure. N. Zuparova and S. Yusupov analysed the economic essence and structure of tourism infrastructure and its role in the socio-economic development of regions, proposing a modern classification [7].

Summarising existing approaches, this study defines tourism infrastructure as the set of facilities and services that enable tourists to reach a region, stay there, eat, take leisure and obtain information. This definition makes it possible to analyse infrastructure not as a collection of separate facilities but as a system of components that should be located in a mutually consistent way within a region.

Theories of regional disparities

The uneven distribution of economic activity and infrastructure across regions is explained within several theoretical approaches. In his growth pole theory, F. Perroux argued that growth does not appear everywhere at once but manifests itself at points or poles of growth with varying intensity, and spreads from there through different channels to the economy as a whole.

G. Myrdal, in his concept of cumulative causation, showed that market forces tend to widen rather than narrow regional disparities. In his view, a developed centre draws labour, capital and activity from surrounding areas (“backwash” effects), while the spread of positive impulses from the centre to the periphery (“spread” effects) is usually weaker. J. Friedmann’s core–periphery model emphasises that economic life and decision-making are concentrated in the core, while the periphery remains dependent on it. In tourism geography, D. G. Pearce showed that concentrating tourist facilities in selected areas may intensify regional disparities while R. W. Butler’s tourism area life cycle model explains how infrastructure development and tourist arrivals evolve together as a destination passes through successive stages [8].

These theories lead to an important conclusion for tourism infrastructure: large state projects and preferential regimes create a growth pole in a region, but its positive impact on neighbouring areas does not emerge automatically. It is therefore scientifically justified to consider the Zaamin tourist and recreational zone in Jizzakh region as a growth pole and to test its impact on surrounding districts quantitatively.

Studies on tourism in Jizzakh region and the research gap

The number of studies on tourism in Jizzakh region has been growing in recent years. J. Abdiramanov, M. Usmanov and Kh. Abdinazarova described the role of the region's accommodation facilities and attractions in tourism development and put forward proposals. A. Daliev and T. Muxiddinov analysed territorial disparities in tourism infrastructure and their impact on tourist flows across the region's 12 districts and Jizzakh city in 2022–2025: disparities were measured by the max–min ratio and the coefficient of variation, the districts were grouped by K-means clustering, and a fixed-effects panel model linked the number of hotels to tourist flows [9]. The present study extends that work in three directions: infrastructure is represented not by a single indicator but by a six-component model based on official statistics on beds, guests and travel agencies; the distribution of infrastructure is compared directly with the distribution of tourist flows through the disparity coefficient; and concentration is assessed with the Gini, Theil and Herfindahl–Hirschman indices, together with a scenario analysis of the Zaamin growth pole.

In international research, the Theil index and the Gini coefficient are widely used to assess regional disparities in tourism. In particular, X. Li, Y. Huang and Y. Wang assessed disparities in tourism economic development across three Chinese urban agglomerations using the Theil index, decomposed into between-group and within-group components, together with the Gini coefficient. H. Li, J. L. Chen, G. Li and C. Goh, using a spatiotemporal autoregressive model, found that tourism reduces regional income inequality in China while P.-L. Lau, T. T. R. Koo and L. Dwyer proposed a Gini-based metric for measuring the geographic dispersion of tourism demand and showed that relying on a single measure may misjudge the spatial performance of tourism markets [10].

The literature review shows that existing studies on Jizzakh region are dominated by either a descriptive approach or the assessment of disparities in tourist flows. Several issues remain insufficiently studied: a direct comparison of the district-level distribution of infrastructure components with the distribution of tourist flows; the application of concentration and inequality indices (Gini, Theil, Herfindahl–Hirschman) to individual components; and an assessment of how the Zaamin tourist and recreational zone affects concentration within the region. This study aims to fill this gap [11].

2. Methods

Structural-component model

The study treats tourism infrastructure as a system of six components (Table 1). The components were identified on the basis of the international models and local classifications reviewed above.

Table 1. Structural-component model of tourism infrastructure and data sources

Component	Indicators	Data source and level
Accommodation facilities	Number of facilities, number of beds, number of guests	Regional statistics department by district
Tour operator services	Number of travel agencies, number of clients served, number of tour packages sold	Regional statistics department by district
Transport and logistics	Cable cars, car parks, service roads	Zaamin TRZ Directorate
Catering	Restaurants and cafés, number of seats	Zaamin TRZ Directorate
Entertainment and recreational facilities	Attractions, sports and wellness facilities, amphitheatre	Zaamin TRZ Directorate

Information and service facilities	Tourist police, medical aid station, administrative and service facilities	Zaamin TRZ Directorate
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Source: developed by the author.

In official statistics, district-level data are available only for accommodation facilities and tour operator services. These two components are therefore analysed quantitatively for all districts of the region. The remaining four components are analysed using the Zaamin tourist and recreational zone as an example, in order to reveal the structure of the growth pole.

Research methods

The study used descriptive statistics, structural analysis and methods for measuring regional inequality. The share of each region i in the indicator was calculated as follows:

$$s_i = \frac{x_i}{\sum_{i=1}^n x_i} \quad (1)$$

where x_i is the value of the indicator in region i (tourists, beds, facilities, etc.), and $n = 13$ is the number of regions.

To assess how well infrastructure matches tourist flows, a disparity coefficient was used. It is based on the logic of the location quotient (where $s_i(\text{infr})$ is the share of region i in infrastructure and $s_i(\text{tour})$ is its share in tourist flows):

$$K_i = \frac{s_i^{\text{infr}}}{s_i^{\text{tour}}} \quad (2)$$

$K_i > 1$ means that infrastructure in the region is over-concentrated relative to its share of tourist flows, $K_i < 1$ indicates an infrastructure shortage, and $K_i = 1$ indicates full proportionality.

The Gini coefficient and the Lorenz curve were used to assess the overall inequality of the distribution. With the values arranged in ascending order, the Gini coefficient is calculated as follows:

$$G = \frac{2 \sum_{i=1}^n i x_{(i)}}{n \sum_{i=1}^n x_i} - \frac{n+1}{n} \quad (3)$$

where $x_{(i)}$ is the value ranked i -th in ascending order; tied values were assigned average ranks. $G = 0$ indicates a perfectly equal distribution, and $G \rightarrow 1$ indicates complete concentration.

The Theil index was used as a more sensitive measure of inequality:

$$T = \frac{1}{n} \sum_{i=1}^n \frac{x_i}{\mu} \ln \frac{x_i}{\mu} \quad (4)$$

where μ is the mean value across regions; the term is set to zero for regions with $x_i = 0$. The index ranges from 0 to $\ln n \approx 2.565$.

The degree of concentration was also assessed using the Herfindahl–Hirschman index and the coefficient of variation:

$$HHI = \sum_{i=1}^n s_i^2, \quad V = \frac{\sigma}{\mu} \quad (5)$$

Under an equal distribution, $HHI = 1/n \approx 0.077$; the higher the value, the fewer regions the indicator is concentrated in.

The resulting indices were interpreted not against criteria developed for income inequality (for example, the 0.4 threshold for the Gini coefficient) but by comparison with the indices calculated for tourist flows themselves. This is because tourism facilities naturally cluster around natural and historical resources, so income distribution benchmarks do not apply to them directly. An infrastructure index higher than the tourist flow index means that infrastructure is more strongly concentrated than demand.

Since district-level infrastructure indicators for 2025 have not been officially published, they were estimated under two scenarios on the basis of official 2024 data and facilities documented as commissioned in the Zaamin tourist and recreational zone in 2025

[6]. In Scenario A (lower bound), the number of hotel beds in Zaamin district was set equal to the 910 beds of the Suffa 2400 resort; in Scenario B (upper bound), these 910 beds and 4 hotels were assumed to have been added in full. Other districts and travel agencies were kept at their 2024 levels, while the number of guests was estimated in proportion to the growth of tourist flows. Conclusions were considered robust only if they held under both scenarios. All calculations were performed in MS Excel using formulas.

The objects of the study are the 12 districts of Jizzakh region and Jizzakh city ($n = 13$). Data were obtained from three sources. First, data of the regional statistics department on the results of 2024: district-level indicators for accommodation facilities and travel agencies. Second, reports of the regional administration on tourist flows: actual figures for 2023–2025 for total, foreign and domestic tourists. Third, data of the Directorate of the Zaamin tourist and recreational zone: the land area of the zone and the capacity and value of commissioned, under-construction and planned facilities.

To ensure the comparability of the data, tourist flow dynamics were examined for 2023–2025, since the methodology for counting foreign tourists in 2022 differed from that of subsequent years. Tourism services exports were not included in the analysis, as this indicator is derived through estimation.

3. Results

Regional structure and dynamics of tourist flows

According to the regional administration, the number of tourists visiting Jizzakh region increased from 1,320,774 in 2023 to 1,852,786 in 2024 and 2,195,689 in 2025. Over this period, tourist flows grew by an average of 28.9 percent per year. The number of foreign tourists increased from 144,201 to 512,579, and their share of total tourists reached 23.3 percent in 2025 (Table 2) [12].

Table 2. Number of tourists visiting Jizzakh region by district and city, persons

Region	2023	2024	2025	Share in 2025, %	Share of foreign tourists in 2025, %	Average annual growth, 2023–2025, %
Jizzakh city	158,995	235,350	202,434	9.2	33.2	12.8
Arnasay	106,195	130,870	183,960	8.4	22.7	31.6
Bakhmal	193,280	249,430	242,186	11.0	22.6	11.9
Gallaorol	67,870	132,600	149,878	6.8	32.5	48.6
Sharof Rashidov	70,010	106,680	157,593	7.2	29.1	50.0
Dustlik	17,020	31,545	25,710	1.2	37.1	22.9
Zaamin	327,105	442,010	784,203	35.7	13.3	54.8
Zarbdor	12,897	24,030	24,300	1.1	24.0	37.3
Zafarobod	12,168	30,951	27,680	1.3	26.5	50.8
Mirzachul	43,226	56,035	52,555	2.4	21.9	10.3
Paxtakor	12,370	22,325	26,370	1.2	22.9	46.0
Forish	245,495	318,070	256,135	11.7	35.1	2.1
Yangiobod	54,143	72,890	62,685	2.9	31.6	7.6
Total	1,320,774	1,852,786	2,195,689	100.0	23.3	28.9

Source: author's calculations based on data of the Jizzakh regional administration; see also.

Zaamin district is the clear leader in the regional structure of tourist flows: in 2025, 35.7 percent of all tourists visiting the region came to this district. It is followed by Forish (11.7%), Bakhmal (11.0%), Jizzakh city (9.2%) and Arnasay (8.4%). These five areas together receive 76.0 percent of the total tourist flow, while the share of each of Dustlik, Zarbdor, Zafarobod and Paxtakor districts does not exceed 1.3 percent.

Growth rates of tourist flows also differ sharply across the region. In 2023–2025, the highest average annual growth was observed in Zaamin (54.8%), Zafarobod (50.8%) and Sharof Rashidov (50.0%) districts, whereas growth was only 2.1 percent in Forish and 7.6 percent in Yangiobod. As a result, Zaamin district's share rose from 23.9 percent in 2024 to 35.7 percent in 2025 [13].

Distribution of infrastructure components by district

According to the regional statistics department, 76 accommodation facilities with a total of 3,429 beds operated in the region in 2024, accommodating 105,225 guests. The structure of accommodation facilities is shown in Table 3.

Table 3. Structure of accommodation facilities in Jizzakh region, 2024

Type of accommodation facility	Number of facilities	Number of rooms	Number of beds	Share of beds, %	Guests, persons
Hotels and similar establishments	44	689	1,544	45.0	66,277
Specialised accommodation facilities	27	726	1,801	52.5	38,530
Individual and other	5	30	84	2.4	418
Total	76	1,445	3,429	100.0	105,225

Source: author's calculations based on data of the Jizzakh regional statistics department.

More than half of all beds (52.5%) are in specialised accommodation facilities (sanatoria, holiday resorts, etc.), while hotels account for 45.0 percent. However, hotels accommodated 1.7 times more guests than specialised facilities, indicating that the hotel stock is used much more intensively.

Table 4. Distribution of tourism infrastructure facilities by district and city, 2024

Region	Accommodation facilities	Beds	Share of beds, %	Guests, persons	Travel agencies
Jizzakh city	29	1,005	29.3	59,889	1
Arnasay	1	10	0.3	550	0
Bakhmal	8	168	4.9	2,945	0
Gallaorol	2	160	4.7	7,183	1
Sharof Rashidov	2	135	3.9	3,097	1
Dustlik	0	0	0.0	0	0
Zaamin	21	1,491	43.5	28,478	2
Zarbdor	0	0	0.0	0	0
Zafarobod	0	0	0.0	0	0
Mirzachul	2	138	4.0	1,065	0
Paxtakor	0	0	0.0	0	0
Forish	9	200	5.8	1,383	11
Yangiobod	2	122	3.6	635	0
Total	76	3,429	100.0	105,225	16

Source: author's calculations based on data of the Jizzakh regional statistics department.

Table 4 shows a sharp regional concentration of infrastructure. Of all beds, 43.5 percent are located in Zaamin district and 29.3 percent in Jizzakh city, so that these two areas together account for 72.8 percent. Jizzakh city accounts for 56.9 percent of guests and Zaamin district for 27.1 percent. Concentration is even higher in the tour operator component: 11 of the 16 travel agencies (68.8%) are located in Forish district. No accommodation facilities or travel agencies were recorded in Dustlik, Zarbdor, Zafarobod or Paxtakor districts [14].

According to the author's estimate for 2025, the number of beds in the region increased to between 3,706 (Scenario A) and 4,339 (Scenario B) owing to the hotels of the

Suffa 2400 resort. As a result, the combined share of Jizzakh city and Zaamin district in total beds rose to 74.8–78.5 percent.

Disparity between infrastructure and tourist flows

The match between infrastructure and tourist flows was assessed using the disparity coefficient calculated according to formula (2) (Table 5, Figure 1).

Table 5. Disparity coefficient between tourism infrastructure and tourist flows

Region	Share of tourists in 2025, %	K 2024	K 2025 (A)	K 2025 (B)	Beds per 1,000 tourists, 2025 (A)	Beds per 1,000 tourists, 2025 (B)
Jizzakh city	9.2	2.31	2.94	2.51	4.96	4.96
Arnasay	8.4	0.04	0.03	0.03	0.05	0.05
Bakhmal	11.0	0.36	0.41	0.35	0.69	0.69
Gallaorol	6.8	0.65	0.63	0.54	1.07	1.07
Sharof Rashidov	7.2	0.68	0.51	0.43	0.86	0.86
Dustlik	1.2	0.00	0.00	0.00	0.00	0.00
Zaamin	35.7	1.82	1.34	1.55	2.25	3.06
Zarbdor	1.1	0.00	0.00	0.00	0.00	0.00
Zafarobod	1.3	0.00	0.00	0.00	0.00	0.00
Mirzachul	2.4	1.33	1.56	1.33	2.63	2.63
Paxtakor	1.2	0.00	0.00	0.00	0.00	0.00
Forish	11.7	0.34	0.46	0.40	0.78	0.78
Yangiobod	2.9	0.90	1.15	0.98	1.95	1.95
Total	100.0	1.00	1.00	1.00	1.69	1.98

Source: author's calculations based on data of the regional statistics department the regional administration and the Zaamin TRZ Directorate. 2025 figures are the author's estimates.

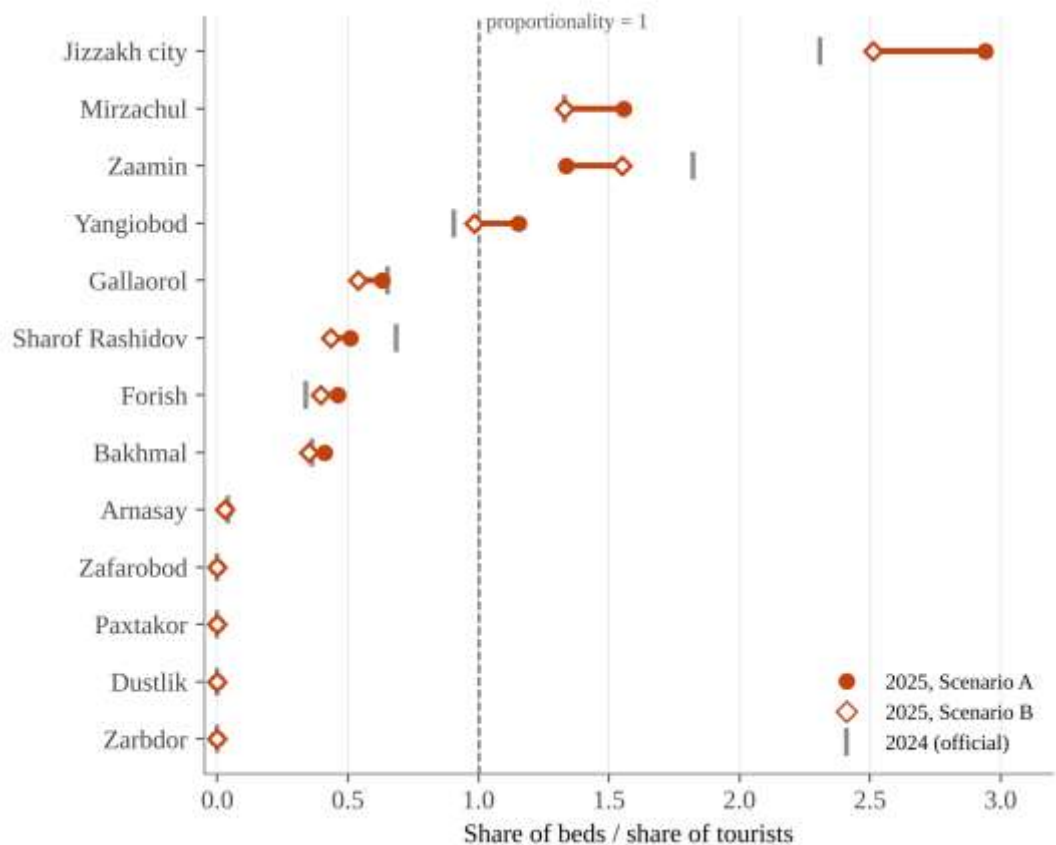


Figure 1. Infrastructure disparity coefficient by district

Source: author's calculations.

The results make it possible to divide the territories into three groups. The first group comprises areas where infrastructure is over-concentrated relative to tourist flows: Jizzakh city ($K = 2.51\text{--}2.94$), Mirzachul ($1.33\text{--}1.56$) and Zaamin ($1.34\text{--}1.55$) districts. The second group includes Yangiobod district ($0.98\text{--}1.15$), where infrastructure is broadly proportional to tourist flows.

The third and largest group consists of areas with an infrastructure shortage. Arnasay district receives 8.4 percent of tourists but has only 0.2–0.3 percent of beds ($K = 0.03$). In Bakhmal ($0.35\text{--}0.41$), Forish ($0.40\text{--}0.46$), Sharof Rashidov ($0.43\text{--}0.51$) and Gallaorol ($0.54\text{--}0.63$) districts, infrastructure also lags considerably behind tourist flows. In Dustlik, Zarbdor, Zafarobod and Paxtakor districts, the coefficient equals zero because there are no accommodation facilities [15].

Notably, the coefficient for Zaamin district fell from 1.82 in 2024 to 1.34–1.55 in 2025. This indicates that, although infrastructure in the district is growing, tourist flows are growing even faster. Across the region, there were only 1.69–1.98 beds per 1,000 tourists in 2025.

Regional inequality indices

The overall inequality in the distribution of tourist flows and infrastructure components was assessed using formulas (3)–(5) (Table 6).

Table 6. Regional inequality indices for tourist flows and infrastructure components

Indicator	Gini coefficient (G)	Theil index (T)	HHI	Coefficient of variation (V)
Tourists, 2023	0.506	0.428	0.147	0.954
Tourists, 2024	0.472	0.368	0.137	0.887
Tourists, 2025	0.522	0.503	0.181	1.161
Beds, 2024 (official)	0.700	0.994	0.287	1.654
Beds, 2025 (A)	0.716	1.053	0.312	1.747
Beds, 2025 (B)	0.746	1.177	0.368	1.944
Accommodation facilities, 2024	0.690	0.912	0.250	1.500
Guests, 2024	0.797	1.342	0.404	2.061
Guests, 2025 (estimate)	0.781	1.304	0.362	–
Travel agencies, 2024	0.817	1.528	0.500	2.345

Source: author's calculations. $n = 13$; under an equal distribution, $HHI = 0.077$.

For all infrastructure indicators, inequality indices are higher than those for tourist flows. In 2025, the Gini coefficient for accommodation beds was 0.716–0.746, compared with 0.522 for tourist flows. The difference is even more pronounced for the Theil index: 1.053–1.177 for beds versus 0.503 for tourist flows. Infrastructure is thus more strongly concentrated than tourist demand [16].

By component, the highest concentration is observed in tour operator services ($G = 0.817$; $HHI = 0.500$), followed by the number of guests ($G = 0.781\text{--}0.797$) and accommodation beds ($G = 0.700\text{--}0.746$). The index for the number of accommodation facilities ($G = 0.690$) is slightly lower than that for beds, indicating that large-capacity facilities are concentrated in a few areas.

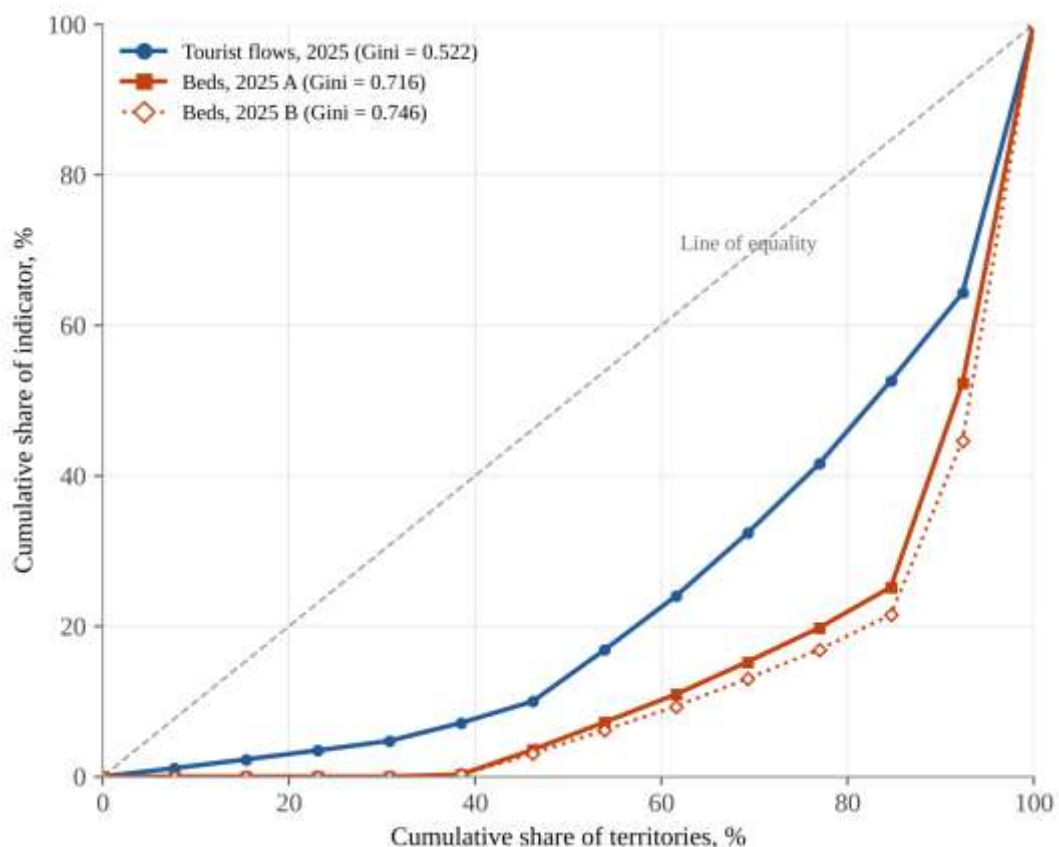


Figure 2. Lorenz curves for tourist flows and accommodation beds, 2025

Source: author's calculations. Beds are the author's estimates.

The Lorenz curves (Figure 2) confirm this conclusion: under both scenarios, the curve for accommodation beds lies well below the curve for tourist flows. Thirty percent of the territories have no beds at all, while nearly three quarters of all beds are concentrated in two areas.

The regional concentration of tourist flows is not constant either (Figure 3). In 2023–2024, the Theil index fell from 0.428 to 0.368, indicating that the flow became somewhat more evenly distributed. In 2025, however, the index rose sharply to 0.503, and the Herfindahl–Hirschman index increased from 0.137 to 0.181. This change is mainly due to the growing share of Zaamin district [17].

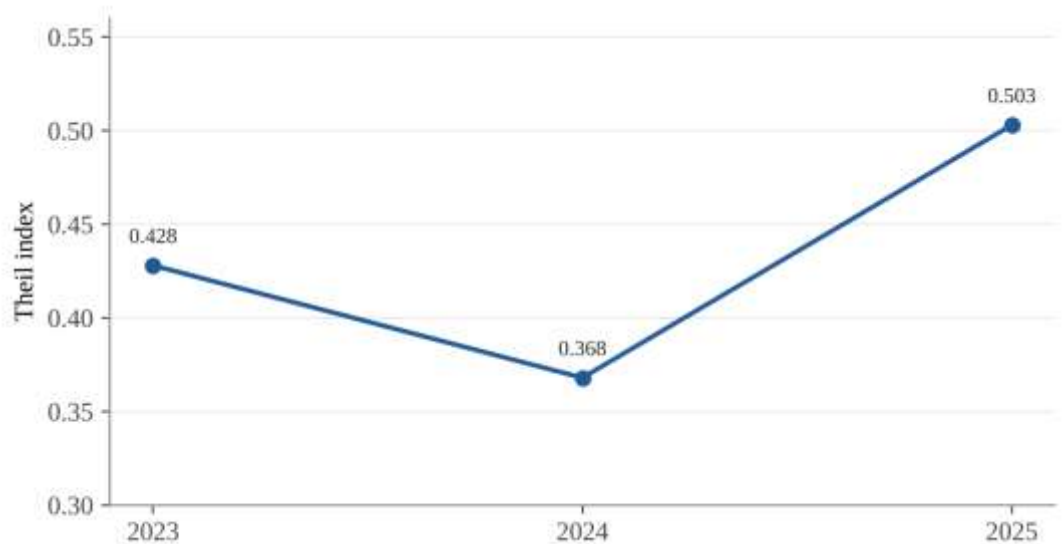


Figure 3. Dynamics of regional inequality in tourist flows (Theil index)

Source: author's calculations based on data of the Jizzakh regional administration.

4.5. The Zaamin tourist and recreational zone and its impact on concentration within the region

The Zaamin tourist and recreational zone covers a total area of 6,432.3 hectares, of which 950 hectares (14.8%) have been developed. The zone lies at an altitude of 1,900–3,500 metres above sea level, and 98.3 percent of its territory consists of land belonging to the Zaamin National Nature Park and the Zaamin State Mountain Juniper Reserve. This requires strict compliance with environmental requirements during construction.

Table 7. Structure of facilities commissioned in the Zaamin TRZ by component

Infrastructure component	Facilities	Capacity	Value, USD million	Share, %
Accommodation	4 hotels (3×3*, 1×2*)	910 beds	41.17	57.6
Transport and logistics	Zomin Ropeway cable car and car park	1,150 persons/hour	13.95	19.5
Catering and entertainment (complex)	Suspension bridge, restaurant, Jumping attraction	600 persons	9.83	13.8
Entertainment and recreation	Zomin Wellness, amphitheatre, Norway Park	100 persons; 1,000 seats	4.87	6.8
Information, service and safety	Emergency services and tourist police building	–	1.65	2.3
Total			71.48	100.0

Source: author's calculations based on data of the Zaamin TRZ Directorate.

Of the value of commissioned facilities, 57.6 percent is accounted for by accommodation and 19.5 percent by transport and logistics infrastructure (Table 7). In addition, facilities worth USD 26.9 million (chalet-style guesthouses, restaurants with 600 and 300 seats, and others) are under construction, and projects worth USD 147.3 million

are planned. The largest of the planned projects are a ski slope with a cable car (USD 54.6 million) and an apart-hotel with staff accommodation (USD 33.8 million) [18].

Thus, the Zaamin tourist and recreational zone is the only area in the region where all six components are being developed comprehensively. In addition, participants of the zone are granted exemptions from property tax, land tax, water use tax and profit tax. This preferential regime does not apply to the other districts of the region.

A scenario calculation was carried out to assess the zone's future impact. According to the master plan, 16,260 beds for tourists are to be created in the zone at the full development stage (11,544 in hotels, 2,016 in chalets and 2,700 in apartments). Assuming that the number of beds in other districts remains at the 2024 level, Zaamin district's share of the region's beds would rise from 43.5 percent to 90.2 percent, and to 95.3 percent together with Jizzakh city (author's calculation). This result shows that the Zaamin zone is emerging as a growth pole but that, without additional measures, the concentration of infrastructure within the region will increase further [19].

4. Discussion

Comparison of the results with theories and other studies

The results confirm F. Perroux's growth pole theory in the case of Jizzakh region. The Zaamin tourist and recreational zone is emerging as a growth pole created by the state: it is the only area in the region where all six infrastructure components are being developed comprehensively, and Zaamin district also receives 35.7 percent of the tourist flow. However, the spread of the growth impulse to surrounding areas predicted by the theory is not yet observed: while Zaamin district's share is increasing, Forish and Bakhmal districts, which have high tourist flows, continue to experience an infrastructure shortage.

This situation is consistent with G. Myrdal's concept of cumulative causation. The increase in the Theil index for tourist flows from 0.368 to 0.503 in 2024–2025 indicates that the "backwash" effect is stronger than the "spread" effect: investment, incentives and tourist flows are concentrating in a single area and reinforcing one another. At the same time, some districts (Sharof Rashidov, Zafarobod) show high growth rates of tourist flows. Further research on tourist movement routes is needed to determine whether this is related to the impact of the Zaamin zone [20].

From the perspective of J. Friedmann's core-periphery model two cores can be distinguished in the region: the administrative core, Jizzakh city, and the tourism core, Zaamin district. Together they account for 72.8 percent of accommodation beds (74.8–78.5 percent in 2025). Dustlik, Zarbdor, Zafarobod and Paxtakor districts, which have no accommodation facilities or travel agencies, form the tourism periphery [21].

The results are consistent with the findings of A. Daliev and T. Muxiddinov. In particular, the coefficient of variation reported in (116.1%) matches the value calculated in this study for tourist flows in 2025 ($V = 1.161$). However, by assessing disparities through a comparison of infrastructure and tourist flows, this study yields an important additional conclusion: inequality in infrastructure is higher than inequality in tourist flows (for beds, $G = 0.716$ – 0.746 ; for tourist flows, $G = 0.522$). This means that regional disparities are explained not only by the uneven distribution of tourist flows but also by the fact that infrastructure is concentrated even more strongly than demand. The grouping of territories obtained here also agrees with the K-means clusters reported in: the leading cluster (Jizzakh city and Zaamin) coincides with the areas of over-concentrated infrastructure, while the developing cluster (Arnasay, Bakhmal, Gallaorol, Sharof Rashidov and Forish) coincides with the districts identified here as having an infrastructure shortage despite high tourist flows. The two studies thus reach consistent conclusions using different methods. The combined use of the Gini coefficient and the Theil index to assess regional disparities in tourism is also consistent with international research practice [22].

Another important result is the decline in the disparity coefficient for Zaamin district from 1.82 to 1.34–1.55. This shows that even in the tourism core, infrastructure is lagging behind the rapid growth of tourist flows. With only 1.69–1.98 beds per 1,000 tourists in the region and only 5.5–5.7 percent of tourists staying in official accommodation facilities, the bulk of tourist flows appears to consist of day trips or unregistered accommodation.

Main causes of the disparities

First, the location of natural and recreational resources. Mountain areas (Zaamin, Bakhmal) and the Aydar–Arnasay lake system naturally direct tourist flows to particular areas. However, infrastructure has not developed in all resource-rich districts. For example, Arnasay district receives 8.4 percent of tourists but has only 0.2–0.3 percent of beds. The planned construction of a tourism centre on the shore of the Aydar–Arnasay lake system may help reduce this shortage [23].

Second, the concentration of state investment and incentives in a single area. In the Zaamin tourist and recreational zone, facilities worth USD 71.5 million have been commissioned, facilities worth USD 26.9 million are under construction, and projects worth USD 147.3 million are planned. Participants in the zone benefit from exemptions from property tax, land tax, water use tax and profit tax. The absence of such a preferential regime in other districts also encourages private investment to flow into the zone. Scenario calculations show that, if the master plan is fully implemented, Zaamin district's share of the region's beds could reach 90.2 percent.

Third, access to transport, information and administrative services. As the administrative centre of the region, Jizzakh city lies on national highways and railways, which partly explains its leading position in terms of hotel stock (disparity coefficient of 2.51–2.94). However, as no quantitative district-level data on transport accessibility are available, assessing the impact of this factor quantitatively remains a task for future research.

Limitations and future research

Several limitations should be acknowledged. First, infrastructure indicators for 2025 rely on scenario-based estimates pending the publication of official district-level statistics; the fact that the main conclusion holds under both scenarios supports its robustness. Second, district-level official statistics are available only for accommodation facilities and tour operator services, so the remaining four components were examined using the Zaamin zone as a case. Third, the analysis is descriptive and does not test causal relationships; factors such as transport accessibility, population and territorial size were not included. Future research could incorporate these variables, apply spatial econometric methods, and extend the analysis to other regions of Uzbekistan.

5. Conclusion

The study revealed significant disparities in the spatial distribution of tourism infrastructure in Jizzakh region and led to the following conclusions. Tourism infrastructure is more strongly concentrated than tourist flows. In 2025, the Gini coefficient was 0.716–0.746 for accommodation beds and 0.522 for tourist flows. The highest concentration is observed in tour operator services ($G = 0.817$). The research hypothesis is thus confirmed. On the basis of the disparity coefficient, the region's territories were divided into three groups: areas with over-concentrated infrastructure (Jizzakh city, Zaamin and Mirzachul districts), a proportional area (Yangiobod district), and areas with an infrastructure shortage (Arnasay, Bakhmal, Forish, Sharof Rashidov and Gallaorol districts, as well as Dustlik, Zarbdor, Zafarobod and Paxtakor districts, which have no accommodation facilities). The Zaamin tourist and recreational zone is becoming the region's growth pole, but its positive impact on surrounding areas remains weak. In 2025, the regional concentration of tourist flows increased (the Theil index rose from 0.368 to 0.503), and full implementation of the master plan could raise Zaamin district's share of

the region's beds to 90.2 percent. Based on the results, the following proposals were developed: to encourage the establishment of family guesthouses, campsites and small hotels in districts with an infrastructure shortage, primarily Arnasay, Forish and Bakhmal, and to give priority to the tourism centre on the shore of the Aydar–Arnasay lake system as a project serving this purpose; to consider the gradual extension of the tax incentives granted to participants of the Zaamin tourist and recreational zone to tourism infrastructure projects in districts with an infrastructure shortage; to extend the impact of the Zaamin zone to neighbouring districts by developing combined tourist routes linking the zone with tourist sites in other districts and by involving local service providers in the zone's activities; to introduce a system of indicators for monitoring the territorial balance of tourism infrastructure in the region, comprising the disparity coefficient, the number of beds per 1,000 tourists, and the Gini and Theil indices, and to extend statistical monitoring to all infrastructure components at district level.

REFERENCES

- [1] Kun.uz, 'A tourism centre to be built on the shore of the Aydar–Arnasay lake system in Jizzakh'. [Online]. Available: <https://kun.uz/kr/news/2025/07/23/jizzaxning-aydar-arnasoy-kollar-tizimi-qirgogida-turizm-markazi-barpo-etiladi>
- [2] X. Li, Y. Huang, and Y. Wang, 'Differences in tourism economic development and its influencing factors among three major city clusters along the middle reaches of the Yangtze River', *PLoS ONE*, vol. 19, no. 5, p. e0299773, 2024, doi: 10.1371/journal.pone.0299773.
- [3] N. A. Zuparova and S. Sh. Yusupov, 'Economic essence, structure and regional role of tourism infrastructure', *Muhandislik va iqtisodiyot*, vol. 4, no. 9, pp. 21–27, 2026, doi: 10.5281/zenodo.23117896.
- [4] G. Myrdal, *Economic Theory and Under-Developed Regions*. London, UK: Duckworth, 1957.
- [5] Dunyo News Agency, 'In 2025, Uzbekistan welcomed a record 11.7 million foreign tourists'. [Online]. Available: <https://dunyo.info/en/turizm/v-2025-godu-uzbekistan-prinyal-iz-za-rubezha-rekordnye-117-milliona>
- [6] Jizzakh Regional Administration (Khokimiyat), 'Information on the implementation of targets for attracting foreign and domestic tourists to Jizzakh region (2023–2025)', Jizzakh Regional Administration, Administrative reports, 2026.
- [7] L. Dwyer and P. Forsyth, Eds, *International Handbook on the Economics of Tourism*. Cheltenham, UK: Edward Elgar, 2006.
- [8] P.-L. Lau, T. T. R. Koo, and L. Dwyer, 'Metrics to measure the geographic characteristics of tourism markets: An integrated approach based on Gini index decomposition', *Tourism Management*, vol. 59, pp. 171–181, 2017, doi: 10.1016/j.tourman.2016.07.019.
- [9] F. Perroux, 'Note sur la notion de «pôle de croissance»', *Économie appliquée*, vol. 8, no. 1–2, pp. 307–320, 1955.
- [10] President of the Republic of Uzbekistan, 'On measures to establish the Zaamin tourist and recreational zone and an international all-season resort (Decree No. PF-6201)'. Apr. 06, 2021.
- [11] President of the Republic of Uzbekistan, 'On measures to increase the role and importance of tourism in the economy by sharply increasing tourist flows and rapidly expanding the scope of tourist services in 2025–2026 (Decree No. PF-87)'. May 15, 2025. [Online]. Available: <https://lex.uz/docs/-7531559>
- [12] Republic of Uzbekistan, 'On Tourism (Law No. ZRU-549)'. Jul. 18, 2019. [Online]. Available: <https://lex.uz/docs/4428097>
- [13] J. Friedmann, *Regional Development Policy: A Case Study of Venezuela*. Cambridge, MA, USA: MIT Press, 1966.
- [14] A. Sh. Daliev and T. Sh. Muxiddinov, 'Territorial disproportions in tourism infrastructure of the Jizzakh region and their impact on tourist flows', *Econoscitech Integration*, no. 6, pp. 610–615, 2026, doi: 10.5281/zenodo.20966443.
- [15] J. R. B. Ritchie and G. I. Crouch, *The Competitive Destination: A Sustainable Tourism Perspective*. Wallingford, UK: CABI Publishing, 2003.

- [16] R. W. Butler, 'The concept of a tourist area cycle of evolution: Implications for management of resources', *Canadian Geographer*, vol. 24, no. 1, pp. 5–12, 1980, doi: 10.1111/j.1541-0064.1980.tb00970.x.
- [17] J. B. Abdiramanov, M. R. Usmanov, and X. O. Abdinazarova, 'The role of accommodation facilities and attractions in the development of tourism in Jizzakh region', *Science and Society*, no. 3–1, pp. 92–94, 2026.
- [18] H. Li, J. L. Chen, G. Li, and C. Goh, 'Tourism and regional income inequality: Evidence from China', *Annals of Tourism Research*, vol. 58, pp. 81–99, 2016, doi: 10.1016/j.annals.2016.02.001.
- [19] Jizzakh Regional Statistics Department, 'Tourism in Jizzakh region: Results for 2024', Jizzakh Regional Statistics Department, Press release, Aug. 2025. [Online]. Available: <https://www.jizzaxstat.uz/uploads/docs/2025%20yil/03/turizm.pdf>
- [20] F. Ismoilova, 'Tourism infrastructure in Uzbekistan and its classification', *Central Asian Journal of Multidisciplinary Research and Management Studies*, vol. 1, no. 13, pp. 4–7, 2024, doi: 10.5281/zenodo.13756302.
- [21] E. Inskeep, *Tourism Planning: An Integrated and Sustainable Development Approach*. New York, NY, USA: Van Nostrand Reinhold, 1991.
- [22] D. G. Pearce, *Tourist Development*, 2nd edn. Harlow, UK: Longman Scientific & Technical, 1989.
- [23] Directorate of the Zaamin Tourist and Recreational Zone, 'Zaamin tourist and recreational zone, Suffa Plateau 2400'. Apr. 14, 2025.