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Article

Spatial Targeting Of State Tourism Infrastructure Programmes And Inter-District Service Disparities: The Case Of Jizzakh Region

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Abstract: The article assesses the spatial targeting of state programmes for tourism infrastructure development in the Jizzakh region against inter-district disparities in services. Under Presidential Resolutions PQ-35 and PQ-161 (2026), tourism projects are concentrated in selected districts, yet their effect on territorial gaps has not been evaluated. The aim is to determine how far programme measures match district development needs. Using official data for 13 territorial units over 2019–2025 and the first half of 2026, the study applies the Gini and Theil indices, σ- and β-convergence, a programme coverage index developed by the authors and Spearman rank correlation. The results show that disparities in per capita services widened: the Gini coefficient rose from 0.269 to 0.330, and no β-convergence was found. No association was observed between programme coverage and the relative development level of districts ($\varrho = 0.03$), while the lagging and slowest-growing districts, Yangiobod, Zarbdor and Mirzachul, remained outside tourism measures. In the first half of 2026, services in programme districts grew by 48.4% in aggregate against 36.3% in other districts excluding Jizzakh city, but the medians were almost equal, so the gap is treated only as an early signal. The findings support need-based project selection criteria and district-level tourism statistics.

Keywords: tourism infrastructure; state programmes; spatial targeting; place-based policy; services sector; regional disparities; Gini coefficient; σ-convergence; β-convergence; Spearman rank correlation; Jizzakh region

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1. Introduction

In recent years, tourism has become one of the priority areas of regional economic development in Uzbekistan. According to preliminary data of the Statistics Agency, 11.7 million foreign tourists visited the country in 2025, which is 46.8 percent more than in 2024 [1]. State policy in the sector is acquiring an increasingly explicit territorial dimension: investment in tourism infrastructure is now planned with reference to specific districts and land plots.

Jizzakh region is a clear example of this process. Presidential Resolutions No. PQ-35 of 30 January 2026 [2] and No. PQ-161 of 30 April 2026 [3] assigned large tourism complexes and master-plan areas to particular districts of the region. In particular, 67 new accommodation facilities and 1,800 jobs are to be created in the region in 2026–2027 [3].

At the same time, economic activity within the region is distributed unevenly. In 2025, market services worth UZS 24,612.9 billion were provided in the region [4]. Jizzakh city accounts for 45.9 percent of services recorded at the district level, and per capita services differ 10.7-fold between the territories with the highest and the lowest values (authors' calculations based on data of the regional statistics department [4]). Under these conditions, the question of which districts state programmes are directed to, and how well this allocation matches territorial needs, becomes an important scientific and practical issue.

Regional economics emphasises that the effectiveness of place-based policy depends on whether resources are allocated with regard to the potential and development level of each territory [5]. The experience of Southern European countries shows empirically that tourism can help reduce income gaps between regions [6], and evidence from China indicates that tourism development contributes significantly to reducing regional income inequality [7].

Whether such an outcome is achieved, however, depends on how tourism resources and investment are distributed across territories.

Theoretically, regional disparities have been explained by F. Perroux's growth-pole concept [8] and by G. Myrdal's cumulative causation, under which market forces widen the gap between developed and lagging regions [9]. J. G. Williamson showed that regional inequality rises in the early stages of national development and declines later [10]. These processes are measured with the σ- and β-convergence framework of R. Barro and X. Sala-i-Martin [11] and the entropy index of H. Theil [12]. Within the place-based approach [5], A. Rodríguez-Pose warns that neglecting economically "left-behind" places has serious social and political consequences [13]. Empirical tourism studies, however, treat tourism development itself as the explanatory factor and do not assess the spatial targeting of state programmes separately [6, 7].

The authors' previous work [14] identified significant territorial disparities in tourism infrastructure of Jizzakh region and their impact on tourist flows, while other Uzbek studies examined the economic essence and regional role of tourism infrastructure [15] and the role of accommodation facilities and attractions [16]. However, the territorial allocation of state programme measures has not been systematically compared with the development level of districts; in other words, it remains unclear whether the programmes are directed to the areas that need them most. The aim of this study is to assess how far the territorial allocation of state programme measures for tourism infrastructure development in Jizzakh region matches inter-district disparities in services and the development needs of districts.

This paper addresses three research questions: (RQ1) How have inter-district disparities in per capita services in Jizzakh region changed in 2019–2025, and is there evidence of convergence? (RQ2) How are the tourism measures of PQ-35 and PQ-161 distributed across districts, and does this distribution correspond to the relative development level of districts? (RQ3) What do the first data for 2026 show about the growth of districts covered and not covered by the programmes?

The study contributes in three ways. First, it provides district-level evidence on σ- and β-convergence of per capita services in Jizzakh region using an official series that is free of the methodological break present in regional totals. Second, it proposes a programme coverage index that translates the territorial provisions of state resolutions into a measurable indicator. Third, it combines this index with the relative development level of districts in a "need–programme" matrix, which identifies districts left outside state tourism measures despite lagging behind.

2. Materials and Methods

2.1. Data

The study uses data of the Jizzakh Regional Statistics Department on the volume of services in 12 districts and Jizzakh city [4], press releases on the permanent population [17], and the texts and annexes of Resolutions PQ-35 [2] and PQ-161 [3]. The analysis covers 2019–2025 and the first half of 2026. Because sharp changes are observed in the values of some districts between 2018 and 2019 (for example, a 2.3-fold increase in Bakhmal district), the analysis starts in 2019. Since 2023, estimates of the informal and hidden economy have been added to the regional total of services, but these estimates are not reflected in district-level data. The district series is therefore comparable over the whole period. All values are in current prices.

2.2. Inequality and convergence measures

Per capita services were calculated as $y_{it} = S_{it}/\bar{P}_{it}$, where S_{it} is the volume of services in territory i in year t and $\bar{P}_{it}$ is the average of the permanent population at the beginning and end of the year. Inter-territorial inequality was assessed using the Gini coefficient (1) and the Theil index (2):

$$G = \frac{2\sum_{i=1}^{n} i\ y_{(i)}}{n\sum_{i=1}^{n} y_i} - \frac{n+1}{n}, \qquad (1)$$

$$T = \frac{1}{n}\sum_{i=1}^{n} \frac{y_i}{\bar{y}} \ln\frac{y_i}{\bar{y}}, \qquad (2)$$

where $y_{(i)}$ are the values ranked in ascending order, $\bar{y}$ is the mean and $n = 13$ is the number of territories.

σ-convergence was assessed using the standard deviation of the logarithm of per capita services (3), and β-convergence by regressing the average annual growth rate on the initial level (4) [11]:

$$\sigma_t = \sqrt{\frac{1}{n}\sum_{i=1}^{n}\left(\ln y_{it} - \overline{\ln y_t}\right)^2}, \qquad (3)$$

$$\frac{1}{T}\ln\frac{y_{i,2025}}{y_{i,2019}} = \alpha + \beta \ln y_{i,2019} + \varepsilon_i. \qquad (4)$$

A decrease in σ_t over time indicates σ-convergence, and a negative and statistically significant β indicates β-convergence. Given the small number of observations, the regression results are interpreted descriptively and were also estimated separately for the 12 districts excluding Jizzakh city.

2.3. Programme coverage index and alignment

To assess the spatial targeting of state programmes, the authors constructed a programme coverage index:

$$PI_i = \sum_{k=1}^{5} D_{ik}, \qquad (5)$$

where $D_{ik} = 1$ if district i is named in measure k, and $D_{ik} = 0$ otherwise. Five measures were included: clause 3(g)(i) of PQ-35 (five large tourism complexes), clause 15 (establishment of tourism complexes), tourism investment projects in Annex 1, clause 14 (expansion of Arnasay airport), and master-plan areas in Annexes 2–3 of PQ-161. The index ranges from 0 to 5; districts with $PI_i \geq 3$ were classified as "programme" districts.

The association between programme coverage and the relative development level of a district, $R_i = y_{i,2025}/y_{2025}$, was measured by the Spearman rank correlation:

$$\rho = 1 - \frac{6\sum_{i=1}^{n} d_i^2}{n\,(n^2 - 1)}, \qquad (6)$$

where d_i is the difference between the ranks of territory i on the two indicators; average ranks were used for ties. A negative and significant ρ means that programmes are directed to lagging districts. A four-group typology of districts was also built on the basis of relative development level (the median of R_i for the 12 districts) and programme coverage. The growth of programme and non-programme districts in the first half of 2026 was compared using aggregate and median values and the Mann–Whitney test. Calculations were performed in MS Excel (formulas) and Python (scipy library).

3. Results

3.1. Dynamics of inter-district disparities in services

The analysis of district-level data shows that, although the services sector grew rapidly in 2019–2025, this growth was distributed unevenly across territories. Services recorded at the district level increased from UZS 4,305.1 billion in 2019 to UZS 16,631.4 billion in 2025, and per capita services rose from UZS 3.15 million to UZS 10.71 million. Over the same period, the share of Jizzakh city in the district total increased from 41.0 to 45.9 percent (Table 1).

Table 1. Disparity indicators of per capita services across territories of Jizzakh region

Indicator	2019	2024	2025	2025 H1	2026 H1
Gini coefficient	0.269	0.321	0.330	0.349	0.318
Theil index	0.208	0.290	0.297	0.345	0.253
Coefficient of variation	0.811	0.984	0.995	1.094	0.896
Max/min ratio, times	6.6	10.3	10.7	11.5	8.9
σ (ln y), 13 territories	0.451	0.526	0.535	0.557	0.519

σ (ln y), 12 districts (excl. Jizzakh city)	0.149	0.206	0.222	0.205	0.252
Gini, 12 districts (excl. Jizzakh city)	0.084	0.100	0.110	0.103	0.131
Share of Jizzakh city in district total, %	41.0	45.8	45.9	49.0	43.0

Source: authors' calculations based on data of the Jizzakh Regional Statistics Department [4, 17]. Half-year indicators are comparable only with each other.

As Table 1 shows, all disparity indicators for per capita services increased in 2019–2025. The Gini coefficient rose from 0.269 to 0.330, the Theil index from 0.208 to 0.297, and the ratio between the territories with the highest and the lowest values from 6.6 to 10.7. The increase in the logarithmic standard deviation from 0.451 to 0.535 indicates σ-divergence rather than σ-convergence.

Importantly, the widening gap is not explained solely by the dominance of Jizzakh city. Excluding the city, σ among the 12 districts increased from 0.149 to 0.222 and the Gini coefficient from 0.084 to 0.110; the districts themselves are thus increasingly diverging in their development. In the first half of 2026, σ for the 13 territories decreased from 0.557 to 0.519 compared with the same period of the previous year, but this was due to slow growth in Jizzakh city: σ among the 12 districts, on the contrary, increased from 0.205 to 0.252.

3.2. Convergence analysis

The results of the β-convergence analysis are presented in Table 2 and Figure 1. In 2019–2025, per capita services in the region grew by an average of 22.6 percent per year (in current prices). The highest growth rate was recorded in the most developed territory, Jizzakh city (24.8%), while the lowest rates were observed in Yangiobod (15.2%), Zarbdor (16.1%) and Mirzachul (16.4%).

Table 2. Per capita services by district and their growth rate

Territory	2019, mln UZS	2025, mln UZS	Average annual growth, %	Relative level 2025 (region = 1)
Jizzakh city	10.02	37.88	24.8	3.54
Arnasay	1.75	5.92	22.5	0.55
Bakhmal	1.86	6.93	24.5	0.65
Gallaorol	2.19	7.62	23.2	0.71
Sharof Rashidov	2.51	7.72	20.6	0.72
Dustlik	2.25	6.41	19.1	0.60
Zaamin	2.31	6.51	18.9	0.61
Zarbdor	1.88	4.60	16.1	0.43
Mirzachul	2.45	6.07	16.4	0.57
Zafarobod	1.69	4.77	18.9	0.45
Paxtakor	2.02	7.30	23.9	0.68
Forish	1.99	6.25	21.0	0.58
Yangiobod	1.52	3.55	15.2	0.33

Region (sum of districts)	**3.15**	**10.71**	**22.6**	**1.00**

β-convergence: β (13 territories) = 0.024; t = 1.49; p = 0.16; R^2 = 0.17

β-convergence: β (12 districts) = 0.017; t = 0.32; p = 0.75; R^2 = 0.01

Source: authors' calculations based on [4, 17]. Growth rates in current prices; β estimated by Eq. (4).

The β coefficient estimated from regression (4) is positive (β = 0.024) and statistically insignificant (p = 0.16). For the 12 districts excluding Jizzakh city, β also remains positive (β = 0.017; p = 0.75). Thus, during the study period, districts with a low initial level did not grow faster, i.e. no β-convergence was observed. Figure 1 shows that Arnasay, Bakhmal, Paxtakor and Gallaorol grew at rates close to the regional average and partly narrowed their lag, whereas Yangiobod, Zarbdor and Mirzachul grew more slowly than all other territories and became the main source of the widening gap.

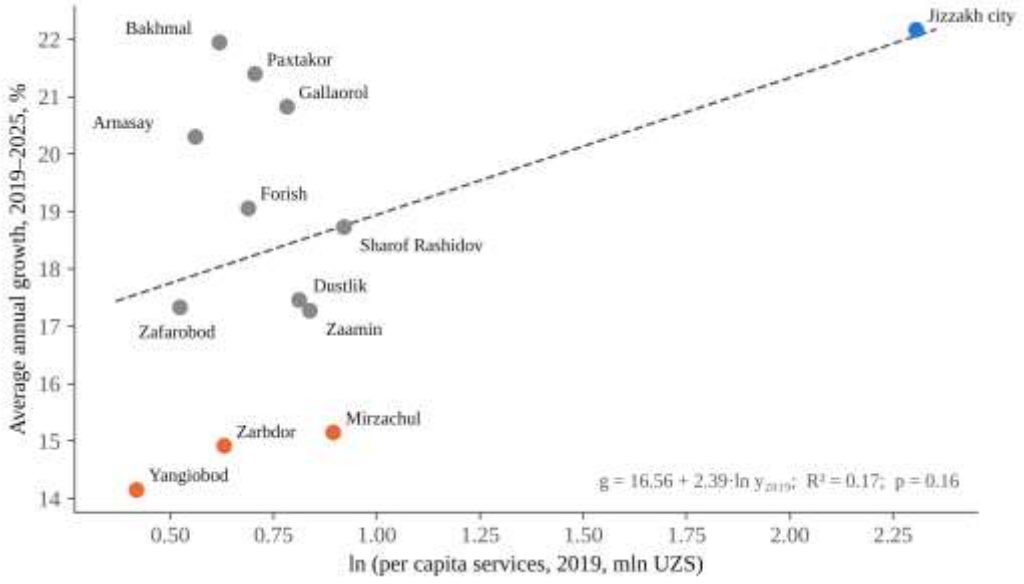


Figure 1. Initial level and growth rate of districts (β-convergence)
Source: compiled by the authors based on Table 2.

3.3. Territorial allocation of state programme measures

The district-level allocation of tourism measures envisaged for Jizzakh region in PQ-35 and PQ-161 is shown in Table 3. The measures are concentrated mainly in five districts — Arnasay, Bakhmal, Zafarobod, Forish and Sharof Rashidov — all of which have a programme coverage index of 3 or higher. The highest index (PI = 4) belongs to Arnasay district, where a large tourism complex, the expansion of the airport and a 207-hectare master-plan area along the Aydar–Arnasay lakes are envisaged. Projects with a specified investment volume are located in Forish (USD 80 million), Sharof Rashidov (USD 35 million) and Arnasay (USD 11 million).

Table 3. District allocation of tourism measures of state programmes and the programme coverage index

Territory	PQ-35, 3(g)(i)	PQ-35, cl. 15	PQ-35, Annex 1	PQ-35, cl. 14	PQ-161, master plan	PI	Relative level 2025
Arnasay	+	+	–	+ (USD 11 m)	+ (207 ha)	4	0.55
Bakhmal	+	+	–	–	+ (39 ha)	3	0.65
Zafarobod	+	+	–	–	+ (115 ha)	3	0.45

Forish	+	+	+ (USD 80 m)	–	–	3	0.58
Sharof Rashidov	+	+	+ (USD 35 m)	–	–	3	0.72
Gallaorol	–	+	–	–	–	1	0.71
Zaamin	–	–	–	–	+ (81.7 ha)	1	0.61
Paxtakor	–	–	–	–	–	0	0.68
Dustlik	–	–	–	–	–	0	0.60
Mirzachul	–	–	–	–	–	0	0.57
Zarbdor	–	–	–	–	–	0	0.43
Yangiobod	–	–	–	–	–	0	0.33
Jizzakh city	–	–	–	–	–	0	3.54

Source: compiled by the authors based on the texts of PQ-35 [2] and PQ-161 [3]. "+" – the district is named in the measure.

Gallaorol and Zaamin districts are named in one measure each. Jizzakh city and the districts of Paxtakor, Dustlik, Mirzachul, Zarbdor and Yangiobod are not included in any of the tourism measures analysed. It should be noted that the regional targets of PQ-161 (67 accommodation facilities, 1,800 jobs) are not broken down by district and were therefore not included in the index.

3.4. Alignment of programmes with territorial needs

The Spearman rank correlation between the programme coverage index and the relative development level of districts in 2025 is $\rho = 0.03$ ($p = 0.92$). This indicates that programme measures are practically unrelated to the development level of districts, i.e. they are systematically directed neither to lagging nor to relatively developed districts. This result is clearly visible in the "need–programme" matrix in Figure 2.

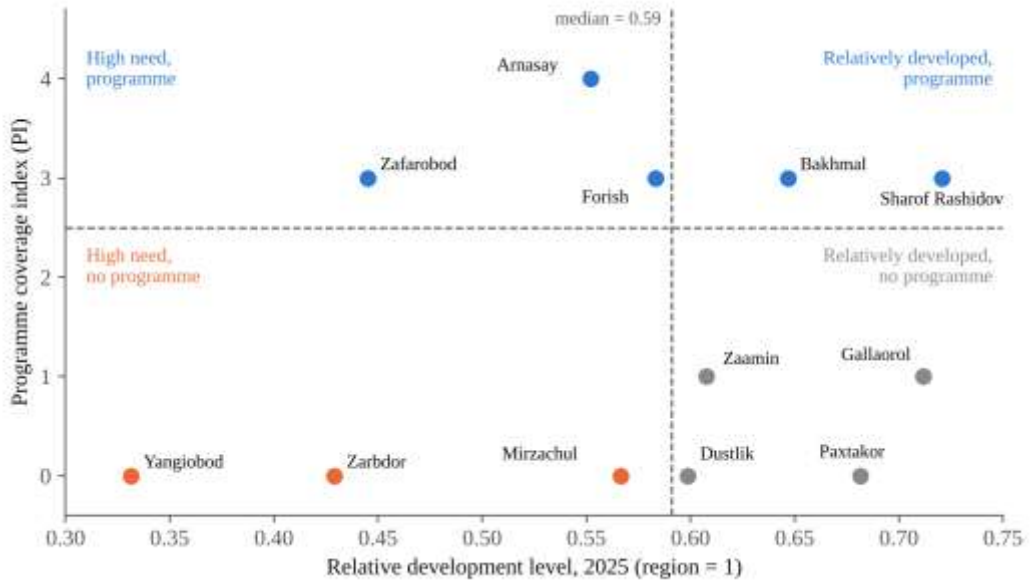


Figure 2. "Need–programme" matrix of districts

Source: compiled by the authors based on Tables 2 and 3. Jizzakh city (3.54) is not shown.

According to the matrix, the districts fall into four groups. The first group, "high need, programme", includes Zafarobod (0.45), Arnasay (0.55) and Forish (0.58), where state programmes are directed in line with needs. The second group, "relatively developed, programme", consists of Bakhmal (0.65) and Sharof Rashidov (0.72); these districts have

high tourism potential, and the location of projects there is determined by resource endowment rather than need. The third group, "high need, no programme", comprises Yangiobod (0.33), Zarbdor (0.43) and Mirzachul (0.57) — precisely the districts that grew most slowly in 2019–2025 and remained outside the programmes. The fourth group includes Dustlik, Zaamin, Paxtakor and Gallaorol.

3.5. First results for 2026

The growth rates of programme and non-programme districts in the first half of 2026 are compared in Table 4. In aggregate, services grew by 48.4 percent in programme districts, by 36.3 percent in non-programme districts (excluding Jizzakh city) and by 11.9 percent in Jizzakh city. The highest growth was observed in Arnasay (100.4%) and Bakhmal (66.6%).

Table 4. Growth of services by district in the first half of 2026

Territory	2025 H1, bn UZS	2026 H1, bn UZS	Growth, %	Group
Arnasay	118.8	238.1	100.4	Programme
Bakhmal	476.2	793.3	66.6	Programme
Sharof Rashidov	857.6	1,217.8	42.0	Programme
Zafarobod	106.9	139.0	30.0	Programme
Forish	303.3	375.7	23.9	Programme
Paxtakor	236.1	373.1	58.0	Non-programme
Zaamin	520.7	766.5	47.2	Non-programme
Dustlik	181.6	266.4	46.7	Non-programme
Yangiobod	47.7	68.0	42.6	Non-programme
Gallaorol	550.2	684.3	24.4	Non-programme
Mirzachul	157.8	190.8	20.9	Non-programme
Zarbdor	209.7	245.0	16.8	Non-programme
Jizzakh city	3,618.6	4,049.0	11.9	–
Programme districts (5): aggregate / median	**1,862.8**	**2,763.9**	**48.4 / 42.0**	
Non-programme districts (7): aggregate / median	**1,903.8**	**2,594.1**	**36.3 / 42.6**	
Mann–Whitney test: U = 22; p = 0.53				

Source: authors' calculations based on [4]. Preliminary data, current prices.

However, the medians of the two groups are almost identical (42.0% and 42.6%), and the difference is not statistically significant according to the Mann–Whitney test (p = 0.53). The aggregate advantage of the programme group is driven mainly by Arnasay,

Bakhmal and Sharof Rashidov, while growth in Zafarobod and Forish was below the median. Moreover, the main PQ-35 projects are scheduled for commissioning in October–December 2026. The first-half results should therefore be interpreted as an early signal rather than a causal effect of the programmes. At the same time, growth in Zarbdor (16.8%) and Mirzachul (20.9%), which remain outside the programmes, was again among the lowest in 2026.

4. Discussion

4.1. Comparison with theory and other studies

The results show that the rapid growth of the services sector in Jizzakh region has not narrowed inter-territorial gaps. σ-divergence and the absence of β-convergence in per capita services are consistent with G. Myrdal's idea of cumulative causation [9] and with J. G. Williamson's conclusion that regional inequality rises in the early stages of development [10]. Whereas international studies have found tourism to be a factor of regional convergence [6, 7], no such effect is yet observed in Jizzakh region. In our view, the main reason is that tourism resources and investment are themselves unevenly distributed across territories.

State programme measures are concentrated in Arnasay, Bakhmal, Zafarobod, Forish and Sharof Rashidov districts. Four of them — Arnasay, Bakhmal, Forish and Sharof Rashidov — were assigned to the intermediate cluster of tourism infrastructure in the authors' previous study [14]. The programmes therefore mainly cover districts that have tourism potential but only moderately developed infrastructure. In this respect, PQ-35 and PQ-161 partly follow the principles of place-based policy [5]: projects are tied to the natural and recreational resources of territories.

However, the absence of an association between programme coverage and the development level of districts ($\varrho = 0.03$) shows that the programmes are not systematically directed towards regional equalisation. The lagging districts of Yangiobod, Zarbdor and Mirzachul remained outside tourism measures and grew most slowly in 2019–2025. A. Rodríguez-Pose described such territories as "places that don't matter" and warned that policies ignoring them heighten social and economic risks in the long run [13]. Tourism need not be the leading sector in every district; these districts therefore require measures that complement tourism.

4.2. Policy implications

The high growth observed in Arnasay and Bakhmal in the first half of 2026 may indicate a possible positive effect of the programmes. Given that the group medians do not differ and that the main projects will be commissioned at the end of 2026, these results cannot be regarded as a final assessment, and the effects of the programmes should be re-evaluated using data for 2027–2028. Based on the results, the following proposals were developed: (i) to introduce need-based criteria for selecting tourism projects that take into account the relative development level of a district alongside its resource potential; (ii) to give priority to Yangiobod, Zarbdor and Mirzachul districts when locating the 1,000 roadside trade, logistics and service facilities envisaged in PQ-35; (iii) to break down the regional targets of PQ-161 (67 accommodation facilities, 1,800 jobs) by district and monitor their implementation openly; and (iv) to publish tourism statistics (accommodation facilities, tourist numbers, accommodation and food services) annually at the district level.

4.3. Limitations and future research

The study relies on total services, as tourism-specific services are not published at the district level, and on current prices. The programme coverage index reflects the territorial scope of measures rather than their scale. Once district-level data on tourism-related services and indicators in constant prices become available, the effects of the programmes can be assessed with econometric methods, including after the main projects have been commissioned.

5. Conclusion

In 2019–2025, inter-territorial disparities in per capita services in Jizzakh region widened (the Gini coefficient rose from 0.269 to 0.330 and the ratio between the highest and the

lowest values from 6.6 to 10.7), including among the 12 districts excluding Jizzakh city, and no β-convergence was found, with Yangiobod, Zarbdor and Mirzachul growing most slowly. Tourism measures under PQ-35 and PQ-161 are concentrated in five districts, while six territories remain outside them; the absence of an association between programme coverage and the development level of districts ($\varrho = 0.03$) indicates that the programmes follow resource potential rather than regional equalisation. Although aggregate growth in the first half of 2026 was higher in programme districts (48.4% versus 36.3%), the medians were almost equal, so this is only an early signal to be re-assessed after the main projects are commissioned. For tourism infrastructure programmes to contribute to territorial balance, need-based criteria for project selection, complementary measures for lagging districts and district-level tourism statistics are necessary.

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