Postprint: Spatial Differentiation and Causative Analysis of Tourism and Leisure Districts in China

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Abstract

Investigating the determinants of spatial distribution of tourism leisure districts holds significant importance for their healthy development. This study analyzes the spatial distribution disparities and their determinants of tourism leisure districts, utilizing 689 tourism leisure districts across China in 2024 as the research sample, and employing kernel density analysis, Dagum Gini coefficient, and geographic detector. The results indicate: (1) Tourism leisure districts can be classified into natural recreation, cultural leisure, health-entertainment recreation, and specialized leisure categories based on their functions and characteristics, with the quantitative hierarchy descending as: cultural leisure > health-entertainment recreation > natural recreation > specialized leisure. (2) The overall distribution pattern of tourism leisure districts in China exhibits a "bipolar dispersed, multi-core point-patch" configuration. The poles are predominantly distributed across urban agglomerations, with the Beijing-Tianjin-Hebei urban agglomeration maintaining pole positions across all categories, owing to its advantages in functional complementarity and rapid factor mobility. (3) Regarding distribution disparities, the various differences of tourism leisure districts descend in order as: inter-provincial, sub-sample cross-overlap phenomenon, and intra-provincial. Among inter-regional differences, most difference pairs constitute cross-regional types, manifesting pronounced east-west disparities overall, while intra-regional differences demonstrate a characteristic of "low in the east and west, high in the middle." (4) From the causal analysis perspective, the influence magnitude of production-living-ecological space on tourism leisure districts descends as: living function > production function > ecological function. The interaction among factors substantially enhances the explanatory power for tourism leisure districts, wherein living function constitutes the dominant factor, production function the critical factor, and ecological function the positive catalytic factor.

Full Text

Spatial Differences and Causes of Tourism and Leisure Blocks in China

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Abstract: Investigating the causes of spatial distribution patterns in tourism and leisure blocks is crucial for their healthy development. This study examines 689 tourism and leisure blocks across China, analyzing spatial distribution differences and their underlying causes through kernel density analysis, Dagum Gini coefficient, and geodetector methods. The findings reveal: (1) Based on function and characteristics, tourism and leisure blocks can be categorized into natural recreation, cultural leisure, entertainment recreation, and specialized leisure types, with quantities descending in the order: cultural leisure > entertainment recreation > natural recreation > specialized leisure. (2) The overall distribution pattern exhibits a "bipolar dispersion, multi-core point-piece" structure. The poles are primarily anchored in urban agglomerations, with the Beijing-Tianjin-Hebei region occupying pole positions across all categories due to its functional complementarity and rapid factor circulation. (3) Regarding distribution differences, the hierarchy from largest to smallest is: inter-provincial > sub-sample cross-overlap > intra-provincial. Most inter-domain difference pairings are cross-regional, showing pronounced east-west disparities, while intra-domain differences follow a "low east-west, high middle" pattern. (4) In causal analysis, the influence magnitude of production-living-ecology spaces on tourism and leisure blocks is: life function > production function > ecological function. Factor interactions significantly enhance explanatory power, with life function as the dominant factor, production function as the key factor, and ecological function as a positive catalytic factor.

Keywords: tourism and leisure blocks; spatial differences; Dagum Gini coefficient; geodetector; influencing factors

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1. Introduction

Tourism and leisure blocks represent distinctive urban spaces with strong regional characteristics and cultural themes that integrate tourism, leisure, consumption, and cultural elements. These vibrant venues cater to diverse and personalized demands from both tourists and local residents, promoting efficient tourism development. The "14th Five-Year Plan for Tourism Development" proposes establishing national-level tourism and leisure blocks to optimize urban-rural tourism spaces, innovate consumption scenarios, and satisfy

public demand for diversified and personalized experiences.

However, homogeneous clustering of similar blocks and lack of comprehensive spatial planning remain problematic. To address these issues and enable tourism and leisure blocks to better fulfill their comprehensive functions, it is essential to clarify their spatial distribution patterns from a holistic perspective, provide strategic planning foundations, and conduct in-depth investigations into distribution causes. Therefore, studying the spatial distribution causes of tourism and leisure blocks is significant for their healthy development.

Academic research on tourism and leisure blocks has focused primarily on: (1) **Spatial distribution studies** at urban or block scales, examining the distribution of tourism elements or commercial outlets within blocks. Since commercial outlets constitute important components of blocks, research emphasizes their spatial distribution in relation to street network accessibility. Compared to other tourism destinations like rural tourism sites or ski resorts, block studies share concerns about spatial agglomeration but differ in scale, focusing on internal block structures rather than national or provincial patterns.

(2) **Block formation causes**, where qualitative research indicates blocks are shaped by capital, social, and political factors driving spatial reproduction processes. Quantitative studies reveal varying correlations between influencing factors across industry types, with blocks also influenced by external factors like consumer demand. The tourism attribute of leisure blocks creates commonalities with other tourism destinations regarding capital-economic influences, though blocks—mostly distributed in urban areas—are more affected by surrounding spatial environments than rural tourism sites, which are heavily influenced by natural village environments. Additionally, while rural tourism policies effectively shape spatial patterns, their impact on urban leisure blocks is more limited.

Current research gaps include: (1) Most spatial distribution studies focus on individual blocks or local geographic scopes, rarely examining national patterns through classification of all blocks; (2) Influencing factor studies remain fixed on single blocks with broad factors, lacking analysis of spatial distribution differences and their specific causes.

2. Methods

2.1 Data Sources National tourism and leisure block data were obtained from the Ministry of Culture and Tourism's first (January 2022), second (January 2023), and third (January 2024) batch lists, totaling 164 blocks. Provincial-level data came from provincial tourism department announcements (January 2021–December 2023), covering 30 provinces with 525 blocks. According to the *Classification and Evaluation of Tourism Resources* (GB/T 18972-2017) standard, blocks were categorized into natural recreation (184), cultural leisure (267), entertainment recreation (166), and specialized leisure (72) types. Chinese vector maps were sourced from the National Geographic Information Public

Service Platform (GS(2024)0650). Block coordinates were obtained using Baidu Maps API. The study adopted provincial scale for analysis, with influencing indicator data from 2023 statistical yearbooks, government websites, and economic databases.

2.2 Analytical Methods **Kernel Density Analysis** identifies spatial agglomeration centers for geographic elements. This method was applied to all blocks and their types to identify national-scale clusters.

Dagum Gini Coefficient decomposes regional differences into intra-regional, inter-regional, and transvariation density components, addressing sub-sample cross-overlap issues. The coefficient quantifies difference sources and their contributions across provinces.

Geodetector, developed by Wang et al. (2017), analyzes driving forces behind phenomena through factor detection and interaction detection. This study employs factor and interaction detection to analyze spatial distribution causes, with q-values indicating explanatory power. Natural breaks in ArcGIS were used for indicator discretization.

3. Results

3.1 Spatial Distribution Patterns Kernel density analysis reveals a "bipolar dispersion, multi-core point-piece" pattern nationwide [Figure 1: see original paper]. The bipolar structure centers on the Yangtze River Delta and Beijing-Tianjin-Hebei urban agglomerations, which form economic and population clusters through regional integration strategies. Multi-core points appear in Fujian, Guangdong, Jilin, Lanzhou-Xining urban agglomeration, and Chengdu-Chongqing economic circle, while piece-shaped distributions radiate from primary and secondary cores, mostly located below the Hu Huanyong Line.

Type-specific patterns show: natural recreation blocks follow bipolar distribution with expanded core areas; cultural leisure blocks develop three poles including Chengdu-Chongqing and Shanxi-Hebei-Shandong-Henan border regions; entertainment recreation blocks concentrate solely in Beijing-Tianjin-Hebei; specialized leisure blocks similarly cluster in Beijing-Tianjin-Hebei with all secondary cores radiating from this pole.

3.2 Distribution Differences **Overall Differences:** The national Gini coefficient is 0.547, with intra-group, inter-group, and transvariation density contributions of 0.017, 0.470, and 0.060 respectively. Inter-provincial differences constitute the primary source (85.995% contribution), followed by transvariation density (10.969%) and intra-group differences (3.037%). This indicates that inter-provincial disparities drive national inequality, while high-value cities in low-level provinces and low-value cities in high-level provinces hinder balanced development.

Inter-domain Differences: Among 435 provincial pairings, 16.129% show high differences and 16.129% show low differences, following a normal distribution. High-difference pairings involve Qinghai, Hebei, and Hubei, while low-difference pairings involve Shandong, Hunan, and Hainan. Most differences are cross-regional, particularly east-west oriented, with east-west and central-west differences being most common. Eastern and western provinces show significant internal variations, while central provinces maintain more balanced distributions.

Intra-domain Differences: Using natural breaks, provinces were categorized into low, medium-low, medium, medium-high, and high difference zones. The pattern shows "low east-west, high middle" characteristics, with eastern, central, and western regional Gini coefficients averaging 0.264, 0.332, and 0.268 respectively. High-difference provinces (Yunnan, Guangxi, Guizhou, Hunan, Zhejiang, Jiangsu) are predominantly southern and adjacent, forming clusters where agglomeration creates spillover effects that amplify neighboring differences.

3.3 Causal Analysis Indicator System: Based on production-living-ecology spaces, the system comprises 3 primary functions, 6 secondary indicators, and 18 tertiary indicators . Production function includes industrial production level and economic development benefits; life function includes resident quality of life and social security level; ecological function includes ecological pressure and ecological response.

Detection Results: Factor detection shows explanatory power ranging from 0.007 to 0.297, with significance levels decreasing after integration but remaining significant overall. Life function shows the strongest individual effect ($q = 0.297$), followed by production function ($q = 0.231$) and ecological function ($q = 0.156$). Secondary indicators rank: industrial production level > social security level > resident quality of life > economic development benefits > ecological pressure > ecological response.

Interaction Effects: All factor interactions show bi-factor enhancement or non-linear enhancement, with life and production functions increasing explanatory power up to 7.8 times their individual effects. Ecological function, while individually weak ($q = 0.156$), substantially strengthens other factors when combined (2.821–5.507× increase). This confirms life function as dominant, production as key, and ecological as catalytic.

Influencing Factors: - **Industrial Production Level** ($q = 0.231$): Reflects service industry development. Tourism revenue growth brings visitors, while industrial structure advancement concentrates potential tourists, making urban leisure blocks preferable destinations. - **Economic Development Benefits** ($q = 0.156$): Provides financial momentum for block development. Trade expansion stimulates investment, economic density reduces transaction costs, and development attracts diversified investment. - **Resident Quality of Life** (q

= 0.156): Determines participation frequency. Higher living standards create demand for social, experiential, and entertainment needs, with urban residents' stable incomes supporting consumption in multifunctional blocks. - **Social Security Level** (q = 0.156): Maintains consumption confidence by reducing anxiety about future expenses. Public infrastructure investment enhances visitor experience and attracts high-caliber residents with stronger consumption capacity. - **Ecological Pressure** (q = 0.007): Minimal direct impact. High pressure damages tourism resources and environments, causing resident outflow and visitor route changes. - **Ecological Response** (q = 0.156): Positive improvement behaviors. Green spaces mitigate urban heat island effects, while waste treatment maintains tourism image and attracts frequent short-term visits.

4. Discussion

This study provides a macro perspective on tourism and leisure block distribution, addressing research gaps in national-scale analysis and comprehensive factor interpretation. Previous studies focused on individual blocks or urban-scale commercial elements, whereas this research classifies all blocks and examines spatial patterns nationwide. While current influencing factor studies emphasize street types and tourist behavior, this work identifies difference sources and constructs a production-living-ecology indicator system tailored to block distribution variations.

The findings offer reference value for balancing national development and narrowing inter-provincial gaps. Limitations include indicator scale constraints due to statistical 口径, suggesting future research could incorporate multi-scale factor comparisons.

Recommendations: 1. **Type-specific strategies:** Develop targeted approaches for sport-oriented blocks (enhance safety measures) and culturally distinctive blocks (create immersive experiences). 2. **Distribution adjustment:** Avoid over-concentration or excessive dispersion by planning according to local population density and integrating with regional tourism development. 3. **Holistic perspective:** Rely on regional integration strategies to reduce inter-provincial differences while addressing high-value cities in low-level provinces and vice versa. Establish environmental accountability mechanisms and improve livelihoods to boost consumption confidence.

5. Conclusions

1. **Classification:** National tourism and leisure blocks divide into natural recreation, cultural leisure, entertainment recreation, and specialized leisure types, with quantities descending as: cultural leisure > entertainment recreation > natural recreation > specialized leisure.
2. **Spatial Pattern:** The overall "bipolar dispersion, multi-core point-piece" structure features poles anchored in urban agglomerations, particularly

Beijing-Tianjin-Hebei, which dominates across all categories through functional complementarity and rapid factor circulation.

3. **Distribution Differences:** The hierarchy is inter-provincial > subsample cross-overlap > intra-provincial. Inter-provincial differences are the primary cause of national inequality, showing clear east-west orientation. Intra-provincial differences follow a "low east-west, high middle" pattern, with medium-difference zones containing the most provinces.

4. **Causal Factors:** Explanatory power ranks: life function > production function > ecological function; industrial production level > social security level > resident quality of life > economic development benefits > ecological pressure. Factor interactions significantly enhance explanatory power, with life function as dominant, production function as key, and ecological function as catalytic.

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Note: Figure translations are in progress. See original paper for figures.