Deep Analysis of the Homogenization Phenomenon of the Ancient Water Towns in Jiangnan: A Dual Perspective on Landscape Patterns and Tourism Destination Images

Xue Chen, Yue Yin, Mu Jiang *, and Hong Lin *

Abstract: Attractiveness plays a key role in the marketing activities that promote the sustainable development of tourist destinations. Many researchers have acknowledged that regional tourist destinations face challenges in attracting tourists due to homogeneity. Achieving sustainability of the ecological landscapes of tourist destinations, creating a unique image that differentiates them from other destinations, and fostering cooperative relationships among regional tourist destinations remain significant challenges. To investigate the reasons behind this and potential solutions to the homogeneity of tourist attractions in regional tourist destinations, our research team employed methods including landscape pattern analysis, tourist destination image analysis, principal component analysis (PCA), clustering algorithm (K-means), text analysis, word frequency analysis, sentiment analysis, and semantic network analysis. Through an in-depth examination of the homogenization phenomenon in the ancient towns of the southern Yangtze River, our research confirms that the spatial form of these ancient towns has become increasingly simple and scattered over time, with a concentration of the same land use types. Half of the sampled ancient towns had exhibited homogeneity in landscape patterns by 2020, with pronounced homogeneity observed in cultivated land, water networks, and hand-made land. Excessive commercialization has further contributed to the loss of local characteristics, resulting in homogeneity issues in the image of tourist destinations in the Jiangnan water towns and ancient towns. This article discusses the characteristics of homogeneity in the ancient towns of the Jiangnan water towns and their practical implications, offering valuable insights and experiences to tourism planners, designers, researchers, and other stakeholders engaged in the study of sustainable regional tourism destinations.

Keywords: the ancient waterfront towns in the south of Yangtze River; Jiangnan; landscape pattern; tourism destination image; homogeneity; heritage tourism attractions

1. Introduction

Tourist attractions, as a core component, significantly drive the tourism industry’s sustainable development [1]. Researchers have recently begun to place increasing emphasis on exploring the role of diversification in tourist attractions within the tourism industry [2]. Lots of researchers have suggested that diversification is one of the key influencers leading to sustainable tourism development [3,4]. Homogenization not only diminishes the competitive edge of individual tourist destinations [5] but also poses a potential threat to the integrity of ecological landscapes [6]. Therefore, revealing the homogenization phenomenon in tourist destinations is a significant topic. This can contribute to a clear exposition of the formation process and specific characteristics of homogenization, providing a fresh perspective for subsequent research and resolution of homogenization issues. The ancient water towns of Jiangnan, with their unique geographical environment and rich history, are vital attractions for domestic and international visitors [7]. As essential carriers of Chinese local culture, the exploration of the cultural heritage value of these
towns, as well as their protection and utilization, have drawn considerable attention from Chinese scholars. Researchers have discussed various aspects of the towns, including spatial features, cultural landscapes, value assessments, protection, and tourism development, establishing a relatively comprehensive knowledge system of these ancient water towns [7–9]. In studying these towns’ sustainable development, scholars have identified issues including ecological degradation [10], over-commercialization [11], and homogenization [12,13]. In recent years, China’s research on ancient town tourism has primarily focused on the features and value of tourist resources, inherent flaws in tourist products, the impact of over-commercialization, discussions on competitive cooperation in tourist regions, and sustainable development. The findings underscore that the successful development of ancient towns necessitates strategic planning by the government, cultural exploration, unique tourism project design to avoid homogenization, and a delicate balance between cultural preservation and commercial activities [14,15]. Although homogenization has negatively impacted the sustainability of ancient town tourism, current research primarily focuses on local aspects of this homogenization phenomenon, with an emphasis on commercial product homogeneity [16]. Attractions are fundamental to tourism, and the landscape character is an important attraction, yet existing research overlooks the significance of landscape patterns in the sustainable development and differentiation planning of these town landscapes. Additionally, the homogenization of tourist destination image is also one of the multifaceted aspects of the homogenization problem. At the same time, there is a significant connection between tourist attractions and the image of tourist destinations. Research on tourist destination image aids in understanding how the ancient water towns of Jiangnan are marketed and perceived by tourists. However, current research on destination image largely focuses on the image analysis of individual destinations [17,18], with a notable lack of comparative studies on the image of the Jiangnan ancient water towns as tourist destinations.

Considering the limitations of previous research, this article embraces a two-pronged approach: landscape pattern analysis and destination image analysis. This study investigates the homogenization issue of Jiangnan’s ancient water towns through detailed research. The main objectives of this study are as follows: (1) Analyzing the landscape patterns of Jiangnan’s ancient water towns to distinguish similarities and differences in their physical structures and layouts. (2) Through an analysis of the tourist destination images of Jiangnan’s ancient water towns, we strive to comprehend visitor perceptions. This will assist in determining if there is a homogenization issue with the tourism image of these towns and its impact on preserving their unique identities. (3) By adopting this dual perspective, we aim to explore the causes, characteristics, and implications of homogenization from both landscape and tourist perspectives. This exploration will aid in formulating strategies to protect their cultural identity and promote sustainable development amidst burgeoning tourism.

2. Literature Review

2.1. Jiangnan Water Towns and Homogenization

In human geography, “Jiangnan” denotes the area south of the Yangtze River’s middle and lower reaches [13], particularly encompassing southern Jiangsu Province, northern Zhejiang Province, and the regions of the Yangtze River Delta and Taihu Lake. This subtropical monsoon region is known for its humid climate, rich network of rivers, and abundant marshes and lakes, earning it the moniker “water town and marshland country [19]”. The “Jiangnan Water Towns” concept was first proposed in 1996 by Professor Ruan Yisan and his colleagues at Tongji University. Since Zhouzhuang Ancient Town initiated tourism development in the 1980s, the Jiangnan water towns and their surrounding areas have seen nearly three decades of tourism growth, becoming renowned tourism brands in China that draw attention and praise from both domestic and foreign tourists. Ms. Ming Jiayang, the director of the UNESCO World Heritage Center for the Asia-Pacific region, suggested that the ancient towns of Wuzhen, Xitang, Nanxun in Zhejiang, and Zhouzhuang, Tongli,
and Luzhi in Jiangsu jointly apply for World Cultural Heritage status. This proposal was eventually realized, forming the initial joint pattern of Jiangnan water towns, representing the traditional Jiangnan ancient towns in China [20]. Research on Jiangnan water towns has been highly regarded in China, and scholars have gradually discovered the issues that these ancient towns face during their development. According to Bian, X. (2010), since the 1980s, after Zhouzhuang Ancient Town initiated tourism development, the region and its surrounding Jiangnan water towns have undergone nearly 30 years of tourism development, making them renowned tourism brands in China, attracting widespread attention and praise from domestic and foreign tourists. However, they also face various challenges, including a singular tourism approach, limited tourism space, weakened attractiveness of tourism products, over-commercialization, destruction of historical and cultural buildings and environments, loss of historical and cultural authenticity, insufficient funds for tourism development and preservation, and low quality of tourist experiences [21]. Chen, M. (2018) indicated that research on the protection and utilization value of China’s historical and cultural towns, using the Jiangnan water towns as a case study, highlights that these towns were among the pioneers of tourism development in China. However, commercial tourism development has also brought negative impacts, leading to the serious commercialization and homogenization of cultural products and causing the disappearance of traditional appearances and cultures in these towns [20]. Liu, S. and Shu, H. (2020) argue that as cultural heritage, Jiangnan water towns confront various challenges during tourism development, where excessive commercialization leads to a loss of local characteristics in these historic towns. Therefore, previous research underscores that environmental degradation, commercialization, and homogenization significantly affect the development of Jiangnan water towns. These unresolved issues have persisted for a considerable period.

The term “homogenization” originally emerged in commodity trade, where it refers to the mutual imitation among different brands of similar products, leading to a progressive market similarity in terms of appearance and marketing methods. Subsequently, the concept of homogenization was adopted in many fields. Wang, W. (2022) pointed out that there is a relatively high overlap of ecological niches in the Chengyu Metropolitan Circle’s tourism competitiveness, indicating a serious phenomenon of tourism homogenization in the area [22]. Sharma, S. et al. (2022) emphasized the importance of intensity analysis and landscape pattern transformation models in sustainable landscape development and planning, as Pitorgarh’s urban development sacrificed arable land and vegetation, resulting in urban agglomeration and homogenization, as well as disintegration and fragmentation in peripheral areas [6]. Shi, C. (2022) studied the homogenization phenomenon in the tourism development of the six major ancient water towns in Jiangnan. Through the use of questionnaires and interviews, the research found that the homogenization of Jiangnan ancient towns refers to the lack of distinct characteristics in terms of management methods, architectural forms, product forms, dining, and entertainment programs during the tourism development process. Regardless of which ancient town tourists visit, they experience the same or similar things, leading to aesthetic fatigue among tourists [23]. Therefore, the issue of homogenization can cause various negative impacts. From the perspective of sustainable tourism development, destination homogenization not only increases the pressure of tourism industry competition but may also lead to excessive development and environmental degradation in tourist destinations, thus affecting their long-term development.

However, existing research has not explicitly demonstrated how urbanization and tourism development have impacted the landscape patterns of these ancient towns, leading to their eventual homogenization. Consequently, undertaking a longitudinal study to analyze changes in the Jiangnan water towns’ landscape patterns over the past 20 years could provide a crucial and innovative approach to investigating their homogenization, thus helping to bridge this research gap.
2.2. Heritage Tourism Attractions

Tourist attractions are typically viewed as essential factors in marketing activities. As stated by Boniface and Cooper (2001), attractions are the lifeblood of tourism, engendering sightseeing, inciting long-distance travel, and fostering the entire tourism industry [24]. The definition of ‘tourist attractions’ is varied. In a narrow sense, tourist attractions refer to tourism resources, including natural and cultural resources. In a broader sense, tourist attractions encompass intangible resources such as tourism services, social systems, and the lifestyle of residents. Alan Fyall summarizes the definition of tourist attractions as the various things and factors from the natural world and human society that attract tourists, making them a core element in tourism activities.

Darren Timothy further categorizes heritage tourist attractions in the broadest sense into natural and man-made attractions. He believes that heritage also includes natural heritage, and cultural heritage consists of both tangible and intangible aspects [25]. The cultural heritage of Jiangnan ancient towns can also be categorized into tangible cultural heritage and intangible cultural heritage [26]. Tangible cultural heritage encompasses historical artifacts, historic buildings, and cultural sites such as characteristic water town architecture, streets, teahouses, bridges, and docks. Moreover, Jiangnan ancient towns not only boast the natural beauty and cultural landscapes of “small bridges, flowing water, and traditional homes” but also possess a rich heritage of water town culture and intangible cultural elements. Both tangible cultural heritage and intangible cultural heritage have the potential to serve as tourist attractions for heritage tourism in Jiangnan water towns. However, the primary tourist attractions are still the natural wonders, tangible artifacts, and the fruits of human diligence and wisdom [1].

Tourist attractions hold power to allure not only because they become appealing after being visited but also due to the desire that people develop to see them, even before a firsthand experience [26]. As Wen Chunyan et al. (2009) highlighted, the destination image represents the overall impression created by the intertwining of different attractions and various aspects of a tourist destination [27]. The most widely accepted definition of destination image, by Crompton (1979), pertains to the holistic beliefs, ideas, and impressions that individuals hold about a particular tourist destination. An examination of these towns’ destination image can illuminate whether there is a homogenization issue in the selection of primary tourist attractions in Jiangnan water towns, as well as how these ancient towns are perceived and marketed to tourists. The role of the image of a tourist destination (TDI) in attracting tourists is a widely confirmed viewpoint. As noted by Picazo, Patricia, and Moreno-Gil, Sergio (2019), in today’s intensely competitive market, creating the right impression is crucial for success. Moreover, the evaluation and analysis of a destination image are principally performed from the viewpoint of tourists’ perceptions [28]. The research content includes the concept and components of TDI [29–31], the influencing factors of the formation and change of TDI [32], the role of TDI in tourist behavior and destination marketing [33–35], the methods for shaping TDI [36], and the measurement and evaluation of TDI [37–39]. Research on destination image has been extensive; however, there have been relatively few comprehensive studies analyzing the destination image of Jiangnan ancient towns. Zhu Zhehui et al. (2021) conducted a web data analysis of the destination image of three ancient towns: Wuzhen, Xitang, and Zhouzhuang. They identified the issue of homogenization in the destination image of these three towns [40]. However, the research data was based on the period from January 2015 to January 2018. Therefore, further research on the most recent destination image of Jiangnan water towns is necessary. Analyzing the recent destination image of Jiangnan ancient towns would illustrate the perception of tourists from 2020 to the present, providing valuable insights for shaping the image of Jiangnan water towns in the future.

2.3. Landscape Pattern Analysis

With the continuous advancement of urbanization and industrialization, the water network and natural landscape pattern around the ancient water towns in the south of the
Yangtze River have been severely impacted, jeopardizing the preservation of the original regional features [41]. The land landscape of ancient water towns in the south of the Yangtze River is currently undergoing profound transformations at local, regional, and global scales. This landscape transformation is characterized by significant changes in landscape types and patterns, resulting in high productivity, which, in turn, leads to the transformation and loss of ecosystems in these ancient water towns. Notably, this includes the conversion of forest and agricultural land into agricultural and building land, respectively [6]. The analysis of landscape proves valuable in exploring the homogeneity characteristics of ancient towns through three primary aspects: analyzing the mosaic structure of ancient town landscape entities and landscape spaces [42], identifying the spatial changes of ancient towns, and evaluating human influence. As an example, P. Messerli et al. adopted a method of converting land cover patches into land cover mosaics to quantify landscape pattern data and investigate the link between land cover information and homogeneous features in the human settlement environment [43].

To effectively evaluate and monitor ecosystems, it is crucial to analyze spatial land cover patterns, commonly referred to as landscape patterns, across the entire landscape area. Researchers have attempted to employ a quantitative approach to determine significant changes in landscape patterns over time and space [44]. Extensive research has been conducted by scholars on spatial landscape patterns, demonstrating the continuous evolution of this field from static to dynamic, from cognition to exploration, and from description to analysis [45].

Landscape ecology researchers have recently shown interest in exploring the three dimensions of landscape topography, substrate, and genesis and their contributions to spatial heterogeneity [46]. For instance, Sun et al. conducted a study on the spatial pattern and vegetation coverage of terraced landscapes using field sampling and unmanned aerial vehicle (UAV) techniques [47]. Their findings revealed that terraced fields significantly altered the spatial pattern of soil moisture, nutrients, and vegetation distribution in the Loess Plateau. Similarly, the impact of urbanization on the regional ecological environment can be understood by observing the structural evolution of landscape patterns, as the fragmentation of landscape patterns is intricately linked to the decline in habitat quality [48]. Landscape indicators serve as widely utilized tools for analyzing, monitoring, and planning landscape patterns [49–51]. To examine changes in landscape patterns and their relationship with driving forces, researchers often employ various tools and methods, including remote sensing (RS), geographic information systems (GIS), land use models, and statistical methods [51–53]. Based on this, the present study will employ landscape pattern indices to describe the spatial forms of the ancient towns.

2.4. Tourism Destination Image Analysis

Baloglu and McCleary (1999) argue that cognitive and affective images directly impact the overall image, and cognitive images also influence the overall image indirectly through affective images. Based on this, a diagram illustrating the relationships between the components of the destination image can be constructed. With the advent of new media and the Web 2.0 era, the integration of the Internet and tourism is becoming increasingly extensive, common, and close-knit. User-generated content (UGC) is becoming more popular, with its characteristics of individuality, authenticity, freedom, and openness, allowing tourists to disseminate their perceptions and feelings about TDI by sharing them on Internet platforms more frequently. As a result, a newly emerging group of scholars uses text (travel notes or comments) or images posted by tourists on network platforms to conduct research on TDI [54,55]. Word frequency analysis, semantic network analysis, and sentiment analysis are commonly used methods for researching destination image. In a study conducted by Lu, L. et al. (2019), the researchers investigated the perceived destination image of Mount Hengshan, a tourist destination in China, using user-generated content (UGC) data. Word frequency analysis was used to study the cognitive image of
Mount Hengshan, while natural language analysis tools were used to analyze the affective image of the destination [56].

The image of a tourist destination (TDI) is an overall perception formed by tourists and potential tourists by processing information from various channels. Research on the image of tourist destinations began in the 1970s, with studies by Mayo (1973), Hunt (1975), and Goodrich (1978) exploring the relationship between tourist destinations and tourist preferences or visit intentions. After decades of development, the literature on domestic and international research into the image of tourist destinations has grown exponentially. TDI is a series of impressions, views, and emotional expressions regarding a tourist destination [57]. TDI belongs to the research field of cognitive psychology and refers to a tourist’s overall understanding and evaluation of a destination. Existing studies have shown that the image of a tourist destination has important value and significance for tourist decision-making [58,59], behavioral tendencies of tourists [60], tourist satisfaction [61], tourist loyalty [62], and destination marketing and promotion [63–65]. However, few studies have compared the images of tourist destinations in the same series and analyzed their homogenization.

To conclude, homogenization is a multifaceted phenomenon that invites analysis from a variety of perspectives and dimensions. We have selected two critical perspectives for our study of the homogenization of ancient towns in Jiangnan water towns: landscape pattern and destination image. We have constructed a new theoretical framework, derived from relevant theories, to study the homogenization of tourist destinations (refer to Figure 1). Furthermore, an empirical study was conducted employing the commonly used research methods of landscape pattern analysis and destination image evaluation. There is a noticeable lack of analysis in existing research regarding the homogenization issue in Jiangnan water towns, particularly from the perspectives of landscape patterns and destination image. This study seeks to fill this research gap by offering insights from these specific angles.

Figure 1. A theoretical model for the study of homogenization of Jiangnan tourist destinations.

3. Materials and Methods

3.1. Study Area

The research area encompasses 15 ancient towns located in Jiangsu, Zhejiang, and Shanghai. These towns include Huishan Ancient Town, Jinxin Ancient Town, Lili Ancient Town, Fenghuang Ancient Town, Luzhi Ancient Town, Nanxun Ancient Town, Qiaodeng Ancient Town, Shaxi Ancient Town, Tongli Ancient Town, Wuzhen, Xitang Ancient Town, Xinchang Ancient Town, Xinshi Ancient Town, Zhenze Ancient Town, and Zhouzhuan Ancient Town (Figure 2). The term “ancient towns in the south of the Yangtze River”
mentioned in this research pertains to a specific concept, referring to towns that have been recognized as famous historical and cultural towns in China. These towns have either been included in the “China World Cultural Heritage Preparatory List” or subsequently added to the list [66].

Figure 2. The location of Jiangsu, Zhejiang, and Shanghai in China (a); the location of the Jiangnan area (b); and the locations of 15 ancient towns (c).

3.2. Materials

The research data pertaining to the landscape pattern perspective are derived from the GlobeLand30 V2020 version. GlobeLand30 is a global land cover dataset developed by China with a spatial resolution of 30 m. The GlobeLand30 V2020 data adopt the WGS-84 coordinate system. For the area between 85° south latitude and 85° north latitude, the projection method utilizes the UTM projection with 6-degree zones. The coordinate unit is meters, and no zone number is added to the coordinates. The accuracy evaluation of GlobeLand30 V2020 data was conducted by a team led by the Aerospace Information Innovation Institute of the Chinese Academy of Sciences. They employed a comprehensive data sampling method based on the landscape shape index sampling model, using over 230,000 sample points. The evaluation results indicate that the overall accuracy of GlobeLand30 V2020 data is 85.72%, with a Kappa coefficient of 0.82.

There are three main steps in collecting landscape model data. First, download the landscape pattern data of the region N50_30 in GlobeLand30 in 2000, 2010, and 2020. Second, preprocess the downloaded data in ArcGIS, including removing black edges and mosaicking. Cut out 15 ancient towns, add a classification table of land use types to the attribute table of each layer, and select all data for symbolization against the color classification table. Third, export the layers in ArcGIS in tiff format, import them into Fragstats 4.2, add layers, check the seven landscape analysis parameters that need to be analyzed, and finally, output the data.

The research data concerning the perspective of tourism destination image are obtained from Ctrip.com (www.ctrip.com), accessed on 15 May 2023. Ctrip.com is the largest online travel operator (OTA) in China, having the earliest website launch and the highest number of customer visits. In 1996, the State Administration of Cultural Heritage of China included the six ancient towns of Zhouzhuang, Tongli, Xitang, Wuzhen, Nanxun, and Luzhi in the China World Cultural Heritage Preparatory List. These towns represent ancient towns south of the Yangtze River. To obtain sufficient text data, this study utilized Python crawlers to acquire tourist comment data on the scenic spots of these six Jiangnan water towns and ancient towns from Ctrip.com. The data collection period spanned from 1 January 2020 to 10 May 2023. The research team initially used search terms such as “Zhouzhuang Ancient Town”, “Tongli Ancient Town”, “Luzhi Ancient Town”, “Xitang Scenic Area”, “Wuzhen”, and “Nanxun Ancient Town” in the “Destination Guide” section of the Ctrip website to retrieve and obtain tourist “user comment” data. Relevant data were obtained using Python crawlers, and after removing duplicate and highly irrelevant user reviews,
a total of 14,152 online tourist reviews were collected. These included 2999 reviews from tourists visiting "Zhouzhuang Ancient Town", 3005 reviews from "Tongli Ancient Town", 1859 reviews from "Luzhi Ancient Town", 2994 reviews from the "Xitang Scenic Area", 3002 reviews from "Wuzhen", and 2995 reviews from "Nanxun Ancient Town".

3.3. Research Methods

3.3.1. Research Framework

In this research project (Figure 3), we explore the morphological characteristics of Jiangnan ancient towns, specifically their compactness, complexity, and agglomeration. This is achieved by collecting land use data from 15 representative ancient Jiangnan water towns, evaluating seven landscape variables, and analyzing the degree of principal components. Subsequently, cluster analysis is employed to assess the degree of homogenization and spatial orientation of the Jiangnan ancient water towns. Additionally, we utilize a text analysis method to interpret the text of tourist reviews of the six ancient water towns in the south of the Yangtze River. By analyzing the destination image based on online tourist reviews, we employ word frequency analysis, sentiment analysis, and semantic web analysis to further investigate whether visitors perceive the homogenization of natural resources within the ancient water towns in the south of the Yangtze River. Furthermore, we aim to identify potential aspects of homogenization through the examination of tourist evaluations.

Figure 3. Overall research framework.

3.3.2. Description of the Spatial Form of Ancient Towns—Landscape Pattern Index

To quantify the morphological characteristics of ancient water towns in the south of the Yangtze River region, we employed seven widely recognized landscape indices (Table 1). These indices consist of patch density (PD), mean patch size (MPS), edge density (ED), patch cohesion index (COHESION), mean shape index (MSI), fractal dimensionality index (FRAC), and Euclidean nearest neighbor distance (ENN). PD and COHESION are utilized to assess the level of urban patch fragmentation, while MPS is used to measure the size of urban land patches. ED, MSI, and FRAC serve to quantify the complexity and compactness of urban form, and ENN indicates the degree of dispersion of urban land. Fragstats 4.2 software was employed for all calculations.
Table 1. Landscape index used to describe the shape of ancient towns in Jiangnan water towns.

<table>
<thead>
<tr>
<th>Index (Abbreviation)</th>
<th>Equation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Patch Density (PD)</td>
<td>PD = ( \frac{N}{\text{AREA}} )</td>
<td>N = Number of patches. AREA = Total landscape area.</td>
</tr>
<tr>
<td>2. Mean Patch Size (MPS)</td>
<td>MPS = ( \frac{\sum_{j} PA_{j}}{N} )</td>
<td>N = Number of patches. PA(_{j}) = Area of patch ( j ).</td>
</tr>
<tr>
<td>3. Edge Density (ED)</td>
<td>ED = ( \frac{E}{\text{AREA}} )</td>
<td>E = Total length of edge in landscape. AREA = Total landscape area.</td>
</tr>
<tr>
<td>4. Patch Cohesion Index (COHESION)</td>
<td>COHESION = ( \left[ 1 - \frac{\sum_{i,j} p_{ij}}{\sqrt{N}} \right] \cdot 100 )</td>
<td>( p_{ij} ) = Perimeter of patch ( ij ) in terms of number of cell surfaces. ( a_{ij} ) = Area of patch ( ij ) in terms of number of cells. Z = Total number of cells in the landscape.</td>
</tr>
<tr>
<td>5. Mean Shape Index (MSI)</td>
<td>MSI = ( \frac{0.25E}{\sqrt{\text{AREA}}} )</td>
<td></td>
</tr>
<tr>
<td>6. Fractal Dimension (FRAC)</td>
<td>FRAC = ( \frac{\ln(0.25p_{ij})}{\ln(a_{ij})} )</td>
<td></td>
</tr>
<tr>
<td>7. Euclidean Nearest-Neighbor Distance (ENN)</td>
<td>ENN = ( h_{ij} )</td>
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</table>

Principal component analysis (PCA) is an unsupervised learning technique that allows for the consolidation of multiple variables into a smaller set of variables while preserving a significant amount of information from the original variables [67]. In this study [13], the seven landscape pattern index variables exhibited a high degree of correlation, with an increase in analysis time due to a large number of prediction weights under consideration. In such situations, the utilization of principal component analysis (PCA) can be beneficial. PCA partitions the dimensionally reduced landscape form index into three categories, namely, PC1, PC2, and PC3, to provide a more concise understanding of the temporal and spatial characteristics of the landscape form of ancient towns.

3.3.3. Homogenization Direction of Ancient Town Morphology—Clustering Algorithm (K-Means)

The K-means model, a widely used clustering model, clusters the landscape pattern data of ancient towns by dividing them into \( k \) clusters and determining the average center of gravity for each cluster [68]. The distances between different clusters are then calculated to establish a cluster structure that determines the direction of homogenization in the morphology of ancient towns. The model facilitates clustering by minimizing distances within clusters and maximizing distances between clusters, thereby achieving the following:

1. Let \( X \) be a given data sample containing \( n \) objects \( X = \{X_{1}, X_{2}, X_{3}, \ldots, X_{n}\} \), where each object has \( m \)-dimensional attributes;
2. The sample is partitioned into \( k \) cluster centers, \( \{C_{1}, C_{2}, C_{3}, \ldots, C_{k}\}, 1 < k \leq n \). The Euclidean distance from each object to each cluster center is calculated using the following mathematical expression:

\[
dis(X_{i}, C_{j}) = \sqrt{\sum_{t=1}^{m} (X_{it} - C_{jt})^2} \quad (1)
\]

\( X_{i} \) refers to the \( i \)-th object 1 \( \leq i \leq n \), \( C_{j} \) represents \( k \) of the \( j \)-th cluster center 1 \( \leq j \leq k \), \( X_{it} \) represents the \( t \)-th attribute of the \( i \)-th object 1 \( \leq t \leq m \), and \( C_{jt} \) represents the \( t \)-th attribute of the \( j \)-th cluster center.
3. The sample is assigned to which center is closest to a center, and \( k \) clusters are obtained \( \{S_{1}, S_{2}, S_{3}, \ldots, S_{k}\}; \)
4. The mean value of each center sample is calculated, and the calculation formula is as follows:

\[ C_l = \frac{\sum_{X_i \in S_l} X_i}{|S_l|} \]  

(2)

\( C_l \) represents the center of the \( l \)-th cluster \( 1 \leq l \leq k \), \( |S_l| \) represents the number of objects in the \( l \)-th cluster, and \( X_i \) represents the \( i \)-th object in the \( l \)-th cluster, \( 1 \leq i \leq |S_l| \).

3.3.4. Analysis of the Tourist Destination Image of Ancient Towns—A Textual Analysis

Textual analysis is a research methodology providing an objective, quantitative description of explicit content [69,70]. Compared to multivariate analysis methods based on questionnaire surveys, the greatest advantage of textual analysis is its capability to capture the complete psychological perceptions of tourists [18]. In the realm of textual analysis, this study employs the ROST Content Mining method and corresponding ROST CM 6.0 software, performing word frequency analysis, sentiment analysis, and network semantic analysis on the obtained UCG online review data. ROST CM 6.0 software, designed and coded by Professor Shen Yang of the School of Information Management, Wuhan University, encompasses functions such as text processing, content mining, and visualization of analysis results. Users of ROST CM are spread over more than 100 universities worldwide, including Cambridge University, Loughborough University, Texas A&M University, Hokkaido University in Japan, Peking University, Tsinghua University, and Zhejiang University. Text processing allows for bulk handling of obtained data based on field characteristics, auxiliary word groups, or self-coded measures, such as information extraction, replacement, deletion, and supplementation. Functional analysis first necessitates text tokenization, after which it can assist mining and analysis as needed, such as word frequency analysis, English–Chinese word frequency analysis, clustering and classification analysis, sentiment tendency analysis, semantic network analysis, social network analysis, and visual display of analysis results. To accurately distinguish and effectively extract high-frequency and sentiment words related to the study, ROST CM 6.0 supports a custom dictionary feature. It is currently widely applied in management science, sociology, and information science research fields and has become an essential approach to studying the image of tourism destinations [71–74]. The research primarily employs word frequency analysis, sentiment analysis, and network semantic analysis to mine and analyze the obtained 14,152 tourist review data.

Word Frequency Analysis: Word frequency analysis is used to count the occurrence of words in online textual materials, uncover the core information hidden in the text, and discover regularities in the vocabulary description of the research object through semantic network analysis [75]. Word frequency analysis is a rudimentary but highly effective text-mining method. This study focuses on tourists’ overall image perception of the six major ancient towns in Jiangnan through word frequency analysis. Before mining the text, we first preprocess the 14,152 texts and set up a custom dictionary that includes words such as “Zhouzhuang”, “Tongli”, “Luzhi”, “Xitang”, “Wuzhen”, and “Nanxun”. After the first segmentation, we put words unrelated to the research content, such as “I”, “of”, “and”, etc., into the filter word list and finally generate high-frequency words about the user reviews of the six major ancient towns in Jiangnan.

Sentiment Analysis: Sentiment analysis involves induction and inference of the emotional tones (negative or positive) of subjective texts, sentences, or phrases, thereby identifying the emotional types of tourist comments, including positive emotions, neutral emotions, or negative emotions. As a research method in marketing, sentiment analysis can efficiently and in real-time reflect consumers’ comprehensive evaluation of products or services [76]. This study uses the Emotion Analysis Tool in ROST CM 6.0 software. Through this tool, detailed results of sentiment analysis, sentiment segmentation statistical results, neutral emotion result files, and sentiment distribution statistical view results can be obtained.
Semantic Network Analysis: Semantic network analysis is based on word frequency analysis and focuses not on the words themselves but on the relationship patterns between words. This method can deconstruct the semantic path between the syntax and concepts of online textual content, thereby identifying the associations and meanings of textual vocabulary. This study uses semantic network analysis to analyze network text with negative emotions and generates semantic network diagrams, further obtaining and analyzing factors leading to tourists’ negative emotions.

4. Results

4.1. Spatiotemporal Characteristics of Ancient Town Form

Among the 15 mentioned Jiangnan water towns, only the first 11 were selected for landscape pattern index analysis to ensure sample data accuracy. Examining the landscape pattern index in 2000 (Table 2), Jinxi Ancient Town had the highest edge density (ED) index, while Shaxi Ancient Town had the highest mean shape index (MSI), mean patch size (MPS), patch cohesion index (COHESION), and Euclidean nearest neighbor distance (ENN) index. Tongli Ancient Town had the highest fractal dimensionality index (FRAC), and Huishan Ancient Town had the highest patch density (PD). Analyzing the landscape pattern index in 2010 (Table 3), Lili Ancient Town had the highest ED index; Xitang Ancient Town had the highest MSI and FRAC indices; Tongli Ancient Town had the highest PD index; and Huishan Ancient Town had the highest MPS and ENN indices. Nanxun Ancient Town had the highest COHESION index. Evaluating the landscape pattern index in 2020 (Table 4), Lili Ancient Town had the highest ED index; Shaxi Ancient Town had the highest MPS and MSI indices; Xitang Ancient Town had the highest FRAC index; Huishan Ancient Town had the highest PD index; and Jinxi Ancient Town had the highest COHESION and ENN indices among these 11 ancient towns.

Table 2. 2000 Landscape Pattern Index.

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<tr>
<th></th>
<th>ED</th>
<th>MSI</th>
<th>FRAC</th>
<th>PD</th>
<th>MPS</th>
<th>COHESION</th>
<th>ENN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinxi</td>
<td>58.5994</td>
<td>1.7054</td>
<td>1.0581</td>
<td>2.8763</td>
<td>34.7675</td>
<td>99.1959</td>
<td>187.6722</td>
</tr>
<tr>
<td>Lili</td>
<td>57.7301</td>
<td>1.7200</td>
<td>1.0811</td>
<td>2.4094</td>
<td>41.5047</td>
<td>99.3657</td>
<td>168.4556</td>
</tr>
<tr>
<td>Luzhi</td>
<td>36.9015</td>
<td>1.7325</td>
<td>1.0797</td>
<td>1.7088</td>
<td>58.5217</td>
<td>99.1308</td>
<td>195.4717</td>
</tr>
<tr>
<td>Nanxun</td>
<td>19.7322</td>
<td>1.5903</td>
<td>1.0712</td>
<td>1.4528</td>
<td>68.8316</td>
<td>99.5771</td>
<td>187.8192</td>
</tr>
<tr>
<td>Phoenix</td>
<td>28.9517</td>
<td>1.6840</td>
<td>1.0804</td>
<td>1.6337</td>
<td>61.2091</td>
<td>99.6943</td>
<td>243.4317</td>
</tr>
<tr>
<td>Qiantong</td>
<td>52.8447</td>
<td>1.6080</td>
<td>1.0738</td>
<td>3.2893</td>
<td>30.4016</td>
<td>99.4293</td>
<td>133.4520</td>
</tr>
<tr>
<td>Shaxi</td>
<td>24.0285</td>
<td>1.8676</td>
<td>1.0811</td>
<td>0.8556</td>
<td>116.8838</td>
<td>99.7667</td>
<td>321.8509</td>
</tr>
<tr>
<td>Tongli</td>
<td>40.2981</td>
<td>1.7647</td>
<td>1.0830</td>
<td>1.6824</td>
<td>59.4391</td>
<td>99.0595</td>
<td>264.6637</td>
</tr>
<tr>
<td>Wuzhen</td>
<td>16.8490</td>
<td>1.4575</td>
<td>1.0705</td>
<td>1.7476</td>
<td>57.22</td>
<td>99.6956</td>
<td>175.8632</td>
</tr>
<tr>
<td>Xinshi</td>
<td>38.9015</td>
<td>1.4808</td>
<td>1.0635</td>
<td>4.0108</td>
<td>24.9324</td>
<td>99.0558</td>
<td>127.9611</td>
</tr>
</tbody>
</table>

Jinxi Ancient Town in 2000 and Lili Ancient Town in 2010 and 2020 exhibited higher patch density (PD) values than other ancient water towns during the same periods [77]. This indicates scattered land use and increased habitat fragmentation, which could have adverse effects on plant and animal species. Shaxi Ancient Town in 2000 and 2020, as well as Xitang Ancient Town in 2010, demonstrated higher mean shape index (MSI) values than other ancient water towns in the same periods. This may be attributed to changes in multiple land use types, resulting in increased complexity of the landscape morphology. Tongli Ancient Town in 2000 and Xitang Ancient Town in 2010 and 2020 had higher fractal dimensionality index (FRAC) values than other ancient water towns during the same periods. These values, close to 2, indicate that the patches in Tongli Ancient Town and Xitang Ancient Town had more complex shapes and experienced greater disturbance from human activities. Huishan
Ancient Town exhibited higher patch density (PD) values in 2000, 2010, and 2020 than other water towns in the same periods. This suggests a higher degree of overall heterogeneity and fragmentation in the landscape of Huishan Ancient Town or certain land use types. Shaxi Ancient Town in 2000 and 2020, as well as Tongli Ancient Town in 2010, had larger mean patch size (MPS) values than other ancient water towns during the same periods, indicating an increasing number of patches and a tendency toward fragmentation. Shaxi Ancient Town in 2000, Nanxun Ancient Town in 2010, and Jinxi Ancient Town in 2020 showed gradual increases in patch cohesion (COHESION) compared to other ancient water towns during the same periods, indicating highly connected natural landscapes and a clustered distribution of patches. Shaxi Ancient Town in 2000, Tongli Ancient Town in 2010, and Jinxi Ancient Town in 2020 exhibited large Euclidean nearest neighbor average distances (ENN), indicating a greater average distance between similar adjacent patches in landscape forms, specifically a larger distance between the grid centers of the patch edges.

Using the matrix of seven pattern indices in 2000 as an example, we begin by computing the values on the diagonal of the covariance matrix for the seven landscape pattern indices (1ED, 2MSI, 3FRAC, 4PS, 5MPS, 6COHESION, and 7ENN). The resulting values are 0.0000, 0.0000, 0.0001, 0.0005, 0.0865, 0.4821, and 4.6136. Based on these data, we obtained the cumulative characteristic values (Y) for each landscape index (Figure 4). Subsequently,
considering the correlation among the seven landscape pattern indices, they are categorized into three groups: PC1 represents ED, MSI, and FRAC; PC2 represents PD, MPS, and COHESION; and PC3 represents ENN.

Figure 4. Principal component analysis of seven landscape pattern indices in 2000.

The spatial form changes of ancient towns from 2000, 2010 to 2020 are depicted in Figure 5, and all PC values are obtained by weighting and summing the corresponding indices. PC1 exhibited a gradual decline over this period, suggesting that the spatial form of ancient water towns south of the Yangtze River tended to become simpler and more dispersed over time. The PC2 index displayed a gradual increase followed by a decline, indicating that the spatial complexity of ancient towns intensified and then reverted back to simplicity. In comparison, the distribution range of PC2 and PC1 showed no significant changes over time when compared to PC3. The level of spatial form aggregation for the 11 ancient Jiangnan water towns deepened in 2000, experienced a sharp decrease in 2010, and then underwent rapid deepening in 2020.

4.2. Homogenization Features of the Ancient Town Form

Cluster analysis of the spatial form data for ancient town landscapes in 2000, 2010, and 2020 reveals that the K values for all three instances are 3. Different classifications are represented by purple, pink, and lake blue data points, while the hollow circles denote changes in the cluster centers in the K-Means algorithm. Analyzing the clustering data image for 2000 (Figure 6a), the Qiandeng Ancient Town, Tongli Ancient Town, Xitang Ancient Town, and Xinchang Ancient Town share similarities in spatial form and belong to the first cluster. Jinxi Ancient Town, Lili Ancient Town, Luzhi Ancient Town, Shaxi Ancient Town, Zhenze Ancient Town, Xinshi Ancient Town, and Zhouzhuang exhibit similar spatial forms and belong to the second cluster. Huishan Ancient Town, Fenghuang Ancient Town, Nanxun Ancient Town, and Wuzhen also share similarities in spatial form and belong to the third cluster. Examining the clustering data image for 2010 (Figure 6b), Qiandeng Ancient Town, Nanxun Ancient Town, Xitang Ancient Town, and Xinshi Ancient Town exhibit similar spatial forms and belong to the second cluster. Huishan Ancient Town, Jinxi Ancient Town, Lili Ancient Town, Luzhi Ancient Town, and Fenghuang Ancient Town share similarities in spatial form and belong to the second cluster. Shaxi Ancient Town, Tongli Ancient Town, Wuzhen, Xinchang Ancient Town, and Zhouzhuang exhibit similarities in spatial form and belong to the third cluster. Analyzing the cluster data image for 2020 (Figure 6c), Fenghuang Ancient Town, Nanxun Ancient Town, Tongli Ancient Town,
Town, Qiandeng Ancient Town, Wuzhen, Xitang Ancient Town, Xinchang Ancient Town, Xinshi Ancient Town, and Zhenze Ancient Town share similarities in spatial form and belong to the first cluster. Huishan Ancient Town, Jinxi Ancient Town, Lili Ancient Town, and Luzhi Ancient Town exhibit similarities in spatial form and belong to the second cluster. Shaxi Ancient Town and Zhouzhuang share similarities in spatial form and belong to the third cluster. Overall, based on cluster analysis of the landscape spatial forms of the 15 ancient water towns and ancient towns in the south of the Yangtze River, the number of ancient towns belonging to the first cluster has increased over the years. By 2020, nine out of the fifteen ancient water towns belonged to the first cluster, indicating a deepening degree of homogeneity.

**Figure 5.** 2000 PCA landscape pattern index (a), 2010 PCA landscape pattern index (b), 2020 PCA landscape pattern index (c).

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Ancient Town, and Xinchang Ancient Town share similarities in spatial form and belong to the first cluster. Jinxi Ancient Town, Lili Ancient Town, Luzhi Ancient Town, Shaxi Ancient Town, Zhenze Ancient Town, Xinshi Ancient Town, and Zhouzhuang exhibit similar spatial forms and belong to the second cluster. Huishan Ancient Town, Fenghuang Ancient Town, Nanxun Ancient Town, and Wuzhen also share similarities in spatial form and belong to the third cluster. Examining the clustering data image for 2010 (Figure 6b), Qiandeng Ancient Town, Nanxun Ancient Town, Xitang Ancient Town, and Xinshi Ancient Town exhibit similarities in spatial form and belong to the first cluster. Huishan Ancient Town, Jinxi Ancient Town, Lili Ancient Town, Luzhi Ancient Town, and Fenghuang Ancient Town share similarities in spatial form and belong to the second cluster. Shaxi Ancient Town, Tongli Ancient Town, Wuzhen, Xinchang Ancient Town, and Zhouzhuang exhibit similarities in spatial form and belong to the third cluster. Analyzing the cluster data image for 2020 (Figure 6c), Fenghuang Ancient Town, Nanxun Ancient Town, Tongli Ancient Town, Qiandeng Ancient Town, Wuzhen, Xitang Ancient Town, Xinchang Ancient Town, Xinshi Ancient Town, and Zhenze Ancient Town share similarities in spatial form and belong to the first cluster. Huishan Ancient Town, Jinxi Ancient Town, Lili Ancient Town, and Luzhi Ancient Town exhibit similarities in spatial form and belong to the second cluster. Shaxi Ancient Town and Zhouzhuang share similarities in spatial form and belong to the third cluster. Overall, based on cluster analysis of the landscape spatial forms of the 15 ancient water towns and ancient towns in the south of the Yangtze River, the number of ancient towns belonging to the first cluster has increased over the years. By 2020, nine out of the fifteen ancient water towns belonged to the first cluster, indicating a deepening degree of homogeneity.

![Figure 6. Visualization of cluster centers of ancient towns in three time periods. (a) Visualization of ancient town cluster centers in the 2000s; (b) Visualization of ancient town cluster centers in the 2010s; (c) Visualization of ancient town cluster centers in the 2020s.](image)

Although the eigenvalue of PC1 is relatively high, it can be seen from the results in Figure 5 that from 2000 to 2020, the PC1 value of Jiangnan ancient water towns showed a slow downward trend as a whole, and the PC2 value first increased, and then decreased. Subsequently, we identified nine ancient towns exhibiting a tendency toward homogeneity and determined the specific land use types in which this homogeneity occurs. The PC2 dataset for 2020 was chosen for analysis (Table 5), revealing that the values for cultivated land, water network, and hand-made land were similar across the nine ancient towns. The similarity in spatial compactness among these towns in terms of cultivated land, water network, and hand-made land indicates that their landscape spatial patterns exhibit homogeneous characteristics. These findings align with the results obtained from the cluster analysis, further substantiating the presence of homogeneity in the landscape spatial patterns.

**Table 5.** Comparison of PC2 landscape pattern data of 6 land use types in 9 Jiangnan ancient water towns in 2020.

<table>
<thead>
<tr>
<th>PC2</th>
<th>Plow</th>
<th>Grass</th>
<th>Shrubland</th>
<th>Wetland</th>
<th>Water</th>
<th>Hand-Made Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoenix Ancient Town</td>
<td>101.8</td>
<td>45.855</td>
<td></td>
<td></td>
<td>98.301</td>
<td>100.502</td>
</tr>
<tr>
<td>Nanxun Ancient Town</td>
<td>101.817</td>
<td>99.909</td>
<td></td>
<td></td>
<td>100.839</td>
<td></td>
</tr>
<tr>
<td>Tongli Ancient Town</td>
<td>101.422</td>
<td>99.024</td>
<td></td>
<td></td>
<td>99.716</td>
<td></td>
</tr>
<tr>
<td>Xinchang Ancient Town</td>
<td>101.413</td>
<td>99.252</td>
<td></td>
<td></td>
<td>100.231</td>
<td></td>
</tr>
<tr>
<td>Xinshi Ancient Town</td>
<td>101.952</td>
<td>102.059</td>
<td></td>
<td></td>
<td>99.53</td>
<td></td>
</tr>
<tr>
<td>Xitang Ancient Town</td>
<td>101.838</td>
<td>86.26</td>
<td>98.87</td>
<td></td>
<td>95.515</td>
<td>101.335</td>
</tr>
<tr>
<td>Qiandeng Ancient Town</td>
<td>101.457</td>
<td>48.429</td>
<td></td>
<td>98.859</td>
<td>101.32</td>
<td></td>
</tr>
<tr>
<td>Wu Ancient Town</td>
<td>102.029</td>
<td>96.909</td>
<td></td>
<td>99.39</td>
<td>99.733</td>
<td></td>
</tr>
<tr>
<td>Zhenze Ancient Town</td>
<td>101.724</td>
<td>84.456</td>
<td></td>
<td>99.19</td>
<td>100.926</td>
<td></td>
</tr>
</tbody>
</table>
4.3. Homogenization Characteristics of the Tourist Destination Image of Ancient Towns

4.3.1. Word Frequency and High-Frequency Words

Word frequency analysis is used for the analysis of tourists’ destination image perception of the six major ancient towns in Jiangnan. Word frequency analysis uses ROST CM 6.0 software to refine the feature words with higher frequency in online reviews, summarizing the top 100 high-frequency words. The analysis and organization of the top 100 frequently occurring words in online tourist reviews of the six major ancient towns in Jiangnan (Table 6) reveal three research findings. First, tourists’ cognition of the destination image of the six major ancient towns in Jiangnan is consistent, which is reflected in the top ten high-frequency words of the six ancient towns, all of which include “ancient town”, “Jiangnan”, “water town”, and “scenic area”. This indicates that tourists have low brand recognition for each ancient town. Second, the high-frequency word “commercialization” is in the top 50 of the word frequency ranking of each ancient town. Tracing back to the original text online, related comments include, “Tongli is also quite commercialized now, there are many shops selling pearls, wine, pastries, and cheongsams, and some brands have several stores, making it difficult to tell which is real and which is fake”. This reflects that tourists believe that the six major water towns have encountered the problem of overcommercialization in the development of tourism. Third, the word “similar” appears in the top 100 words of the remaining five ancient towns except for Wuzhen. One tourist commented, “There are many water towns in Jiangnan, and after careful selection, we chose Wuzhen. We are short on time and it is not possible to visit them all. In addition, they all look quite similar. The night view of Xizha in Wuzhen is very beautiful; of course, the commercialization is high, which everyone understands and can accept. Xitang, Nanxun, Zhouzhuang, Luzhi, they are all good, but how can we visit them all. Visiting one representative town is satisfying”. This indicates that for tourists, there is a problem of homogenization in the destination image of ancient town tourism.

The previous word frequency analysis found that the tourist destination images reflected by the top 20 high-frequency words of different ancient towns are the same, and the brand differences between ancient towns are not obvious. The images of different ancient towns have low recognizability for Chinese tourists. To further identify tourists’ perception of the brand image of the ancient towns, the sequence numbers and frequencies of the top 100 high-frequency words (see Supplementary Table S1) in the comments of the six major ancient towns in Jiangnan were used as variables for curve fitting, and it was found that the high-frequency words followed a power-law distribution (Figure 7). The coefficient of determination $R^2$ values of the simulation equation are 0.9866, 0.9929, 0.9882, 0.9923, 0.9917, and 0.9883, respectively, indicating a high goodness-of-fit. According to the long tail theory, the word frequency distribution of the reviews of the six major ancient towns in Jiangnan exhibits a clear “long tail” distribution characteristic. The power-law distribution and “long tail” characteristic suggest that, while a small number of words (head) are frequently used in tourist reviews, a large number of words (long tail) are less common but still contribute to the overall understanding and interpretation of the destination image. This finding indicates a wide range of attributes and elements associated with the brand image of ancient towns as perceived by tourists. Furthermore, the high goodness-of-fit values demonstrate the validity of the power-law distribution model in this context.
Table 6. High-frequency words in destination image perception of the six major ancient water towns in Jiangnan.

<table>
<thead>
<tr>
<th>High-Frequency Words of Zhouzhuang Ancient Town</th>
<th>Ranking</th>
<th>High-Frequency Words of Tongli Ancient Town</th>
<th>Ranking</th>
<th>High-Frequency Words of Luzhi Ancient Town</th>
<th>Ranking</th>
<th>High-Frequency Words of Xitang Ancient Town</th>
<th>Ranking</th>
<th>High-Frequency Words of Wuzhen Ancient Town</th>
<th>Ranking</th>
<th>High-Frequency Words of Nanxun Ancient Town</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>ancient town</td>
<td>1</td>
<td>ancient town</td>
<td>1</td>
<td>Xitang</td>
<td>1</td>
<td>Wuqin</td>
<td>1</td>
<td>ancient town</td>
<td>1</td>
<td>ancient town</td>
<td>1</td>
</tr>
<tr>
<td>Jiangnan water town</td>
<td>3</td>
<td>attractions</td>
<td>4</td>
<td>Jiangnan</td>
<td>4</td>
<td>ancient town</td>
<td>4</td>
<td>water town</td>
<td>5</td>
<td>Nanxun</td>
<td>2</td>
</tr>
<tr>
<td>scenery</td>
<td>5</td>
<td>entrance fee</td>
<td>5</td>
<td>scenic area</td>
<td>5</td>
<td>water town</td>
<td>5</td>
<td>attractions</td>
<td>5</td>
<td>water town</td>
<td>5</td>
</tr>
<tr>
<td>picturesque bridges and flowing water place</td>
<td>6</td>
<td>water town</td>
<td>6</td>
<td>bars</td>
<td>6</td>
<td>scenic area</td>
<td>6</td>
<td>scenery</td>
<td>6</td>
<td>scenic area</td>
<td>6</td>
</tr>
<tr>
<td>scenic area</td>
<td>8</td>
<td>place</td>
<td>7</td>
<td>local cuisine</td>
<td>7</td>
<td>Dongzha</td>
<td>7</td>
<td>entrance fee</td>
<td>7</td>
<td>entrance fee</td>
<td>7</td>
</tr>
<tr>
<td>evening worth</td>
<td>9</td>
<td>scenic area</td>
<td>9</td>
<td>evening</td>
<td>9</td>
<td>place</td>
<td>9</td>
<td>water town</td>
<td>9</td>
<td>water town</td>
<td>9</td>
</tr>
<tr>
<td>Suzhou</td>
<td>10</td>
<td>Suzhou</td>
<td>10</td>
<td>place</td>
<td>10</td>
<td>night view</td>
<td>10</td>
<td>place</td>
<td>10</td>
<td>place</td>
<td>10</td>
</tr>
<tr>
<td>commercialized</td>
<td>26</td>
<td>commercialized</td>
<td>30</td>
<td>commercialized</td>
<td>28</td>
<td>commercialized</td>
<td>48</td>
<td>commercialized</td>
<td>29</td>
<td>commercialized</td>
<td>29</td>
</tr>
<tr>
<td>similar/homogenized</td>
<td>84</td>
<td>similar/homogenized</td>
<td>89</td>
<td>similar/homogenized</td>
<td>89</td>
<td>similar/homogenized</td>
<td>82</td>
<td>similar/homogenized</td>
<td>100</td>
<td>similar/homogenized</td>
<td></td>
</tr>
</tbody>
</table>
4.3.2. Sentiment Analysis and Satisfaction Evaluation

The emotional cognition of tourists toward the six major ancient towns in Jiangnan is an important part of their overall image. Studies have shown that tourists with high positive emotions believe that tourism products are more attractive and unique [78]. As a research method in market marketing, sentiment analysis efficiently and in real time reflects consumers’ evaluations. The sentiment analysis tool in ROST CM 6.0 is used to analyze the comments of the six major ancient towns in Jiangnan. The results show (Figure 8) that, overall, tourists have positive emotions toward the six major ancient towns in Jiangnan, with positive emotions at approximately 71%, very few neutral emotions, and negative emotions at approximately 28%. This indicates that tourists believe that the ancient towns in Jiangnan are worthy of being tourist destinations, but there are some aspects that should be further improved. The aspects in need of improvement have generated negative
emotions in tourists, reducing tourists’ evaluation of the ancient towns in Jiangnan. The detailed analysis of the sources of negative emotions can help identify these areas that need improvement and contribute to enhancing the overall tourism experience and satisfaction. These findings underline the importance of ongoing monitoring and analysis of tourist reviews to understand their perceptions and emotions and adapt tourism services and offerings accordingly.

![Figure 8. Sentiment analysis of the six major ancient water towns in Jiangnan.](image)

4.3.3. Semantic Network Analysis

To further understand the factors that influence negative sentiment among tourists and to propose suggestions for the sustainable development of tourism in Jiangnan’s ancient water towns, we conducted a semantic network analysis of negative sentiment. This analysis generated a semantic network graph (Figure 9) that depicts the primary factors influencing negative sentiments among visitors to the six major ancient water towns of Jiangnan. Notably, factors such as “overcommercialization of ancient towns”, “perceived similarity among the towns”, and “poor value-for-money of admission fees” have been identified, all of which negatively affect tourist satisfaction. For instance, through retrospective analysis of original comments, our research team identified one tourist review stating, “Zhouzhuang is excessively commercialized, with streets full of vendors selling the same products. The so-called grand mansions are just Zhang Hall and Shen Hall, which are not particularly distinct when compared to mansions in other ancient towns. The entrance fee seems to be 100 yuan, and although one might save a bit by buying a bundled ticket on Ctrip, the overall value-for-money after the visit does not feel high”.

![Semantic Network Graph](image)
Figure 9. Negative emotion semantic network diagrams of the six major ancient water towns in Jiangnan.
5. Discussion

5.1. The Shape of Ancient Towns in Jiangnan Water Towns Is Gradually Homogenized

Firstly, this study examines the spatial environmental morphology characteristics of 15 typical ancient water towns in the southern region of the Yangtze River from the perspective of landscape patterns. Recognizing the sensitivity of these ancient towns to their environment, this paper aims to gain a comprehensive understanding of their spatial characteristics. The principal component analysis is employed to explore the correlations between landscape indices, effectively reducing the influence of human factors and enabling a macrolevel evaluation of the morphological characteristics of Jiangnan water towns. The data used in this study primarily consist of global land cover data, which offer extensive coverage and high-resolution readings, thereby enhancing the accuracy of the analysis of the spatial environmental morphology of ancient towns in the southern Yangtze River region.

5.1.1. Homogenization: The Result of Multiple Factors

Ancient water towns in the southern Yangtze River region are characterized by their interconnectedness through ancient canals and water networks, forming a distinct cultural fabric of production and livelihood intertwined with water. However, the clustering algorithm-based analysis of morphological homogeneity data from 2000 to 2020 reveals that the homogeneity of cultivated land, water networks, and hand-made land in Jiangnan water towns has become increasingly apparent. This homogeneity does not stem from the formation of large-scale “urban clusters” through canal and water network expansion in the traditional sense but rather arises from a combination of factors [79]. In view of the homogenization of cultivated land, water network, and man-made land in Jiangnan water towns and ancient towns, the following three measures need to be implemented: protecting traditional characteristic agriculture, maintaining the unique wetland ecosystem in water towns, and preserving traditional buildings in ancient towns while preventing repeated construction and random construction and demolition.

5.1.2. Spatial Form: Corresponding to Local Identity

The development of tourism in ancient water towns in the south of the Yangtze River has become an important driving force for accelerating urbanization and industrial restructuring. Faced with the challenge of spatial homogeneity, it is necessary to elucidate and refine the objective expression of local characteristics in the spatial form of ancient towns in the southern Yangtze River region, emphasizing the spatial and temporal differences and ensuring that the spatial form resonates with the local identity. As Heidegger once stated in his work, “Wherever we are, no matter how we relate to any being, identification makes them clear to us [80].” At the same time, echoing the local identity in terms of spatial form will also help to improve the homogeneity of ancient towns in the south of the Yangtze River. The relationship between place identity and tourism benefits is positively correlated; the higher the degree of place identity, the higher the tourism benefits [81]. The spatial form is the way to understand the regional culture and the material carrier of the local people’s emotions. When the spatial form echoes the local identity, it can indirectly promote the tourism benefits of the ancient water towns in the south of the Yangtze River, thereby further promoting the differentiated development of the ancient water towns in the south of the Yangtze River.

5.1.3. Emphasize the Sustainability of the Ecological Landscape of Tourist Destinations

Balancing economic interests and environmental pressure is crucial for achieving sustainable tourism development. In the ecological landscape protection areas of ancient towns, it is important to respect the local tradition of vegetation planting and adhere to principles of environmental aesthetics and ecological sustainability. Specifically, in terms of system and mechanism innovation, it is necessary to formulate sustainable tourism policies, implement energy-saving emission reduction and resource recovery systems, and promote local communities to participate in tourism management decision-making; in terms of
publicity and education, it is necessary to promote low-impact tourism activities, enhance environmental education and visitor awareness; and in terms of scenic spot management, it is necessary to limit the number of tourists and visit times and focus on protecting natural habitats.

5.2. The Tourist Destination Image of Ancient Towns

5.2.1. Perception of Tourist Destination Image and Strategies

Secondly, this study conducted an analysis of tourist review texts for the six major Jiangnan water towns, examining the destination image of these towns in the minds of Chinese tourists. The research findings were similar to those of previous scholars who analyzed textual content from January 2015 to January 2018, including news articles, official WeChat public accounts, and online travelogues, indicating that the destination image of the six major Jiangnan water towns does exhibit a certain degree of homogenization [40]. In this study, data from tourist reviews on Ctrip.com from January 2020 to May 2023 were utilized to further investigate the latest destination image of these water towns. The results revealed that the brand identity of the six major Jiangnan water towns is not highly distinctive, and most tourists still perceive them as typical Jiangnan water towns with “small bridges, flowing water, and traditional houses”. This suggests that the landscape features of Jiangnan water towns are crucial references for tourists and significantly contribute to the destination image of these towns. Tourists’ evaluations of Jiangnan water towns are based on their perceptions and experiences of the landscape features, such as the main scenic elements and spatial layouts. Therefore, it is speculated that the primary tourist attraction of Jiangnan water towns, namely their landscape features, experiences homogenization issues. Moreover, based on sentiment analysis of tourist reviews, it can be observed that the homogenization of landscape patterns leads to negative experiential feelings among tourists.

From the perspective of information dissemination, scholars like Clare A. Gunn classify destination images into three categories: primordial image, induced image, and composite image. The primordial image refers to the first impression of a destination formed by individuals through education or non-commercial sources of popular culture and literature and is endogenous. The induced image, on the other hand, results from deliberate commercial advertising and promotional efforts by the destination. Finally, the composite image is a more comprehensive perception formed by travelers based on their experiences and prior knowledge after visiting the destination. Thus, it is crucial to focus on differentiating the induced image construction.

The research team speculates this phenomenon occurs for two primary reasons. Primarily, all the Jiangnan water towns are rooted in the shared cultural heritage of the Wu and Yue dynasties, situated in the Taihu Lake Basin, and influenced by the water town lifestyle, inevitably leading to the association with the typical impression of “small bridges, flowing water, and traditional houses” that characterizes the Jiangnan water towns. Furthermore, the destination image of Jiangnan water towns indicates that the prominent tourist products they offer exhibit a high degree of homogeneity, lacking significant differentiating factors. The root cause of this lies in the fact that tourism products rely on existing resources to quickly develop corresponding attractions for visitors. Since such products often lack interactive and unique elements, they are prone to replication and result in reduced product differentiation.

Analyzing the long-tail curves of high-frequency words associated with the ancient towns in the six Jiangnan water towns, it is evident that the perception of each ancient town’s tourist destination consists of core and peripheral images. The characteristic words at the head of the curve represent the core image, which encapsulates the overall image characteristics of the ancient town and reflects the tourism products offered. On the other hand, the long-tail words can be seen as the marginal image of the perception [82], providing insight into tourists’ cognitive understanding of different ancient towns. Drawing upon Rogers’ innovation diffusion theory [83], this segment of the market may initially consist of
innovators for the six ancient towns in the southern Yangtze River, but they are likely to evolve into mainstream buyers later, becoming the core group in the destination market. Building on the long-tail distribution structure, Pan, B. and Li, X. R. (2011) discovered that users employing niche words in online environments demonstrate stronger intentions to travel [84]. Hence, within the image structure of Jiangnan water towns and ancient towns, marginal image components often represent potential market opportunities, underscoring their significance in enhancing recognition and warranting ample attention from Jiangnan water towns. Moreover, relying solely on a single attraction, a destination is unlikely to sustain itself in the long term. In the sustainable development of a destination, tourist attractions can act as “stimulants”. Therefore, we recommend that the official media of each ancient town can refer to their respective marginal images to create distinctive and personalized brand images that attract visitors. Recognizing the role of tangible cultural heritage in destination marketing, unique historical sites and museums can be promoted as tourist attractions to create distinctive destination brands. For instance, Tongli Ancient Town can focus on promoting the “Tuisi Garden” as a World Cultural Heritage site, enhancing its image and improving overall tourist satisfaction. Tangible cultural heritage holds significant historical, cultural, and artistic value and has the potential to attract visitors from around the world. Leveraging these cultural assets enables destinations to offer distinct tourism experiences and attract a larger number of tourists.

5.2.2. Sentiment Analysis Destination Image and Strategies

Through sentiment analysis, it has been observed that tourists exhibit higher levels of positive emotions toward the six ancient water towns in the southern Yangtze River compared to negative emotions. The primary influencing factor for negative emotions stems from the extensive introduction of low-end tourism businesses in various ancient towns aimed at accelerating their transformation from historical communities to tourist attractions. This has resulted in a disconnect between the business format of ancient towns and their heritage value, leading to a significant homogenization phenomenon among the business formats across ancient towns. Consequently, tourists’ evaluations of the ancient water towns in Jiangnan have been negatively affected, while commercial and public facilities and spaces that should serve the town’s residents have been marginalized. As a result, the interests of residents are compromised, and conflicts arise between them and the management agencies responsible for protection and travel companies. Liu, S., and Shu, H. (2020) also highlight that excessive commercialization can lead to the loss of local characteristics in historical towns. In light of our analysis, we recommend that management agencies and tourism companies, while fostering the growth of tourism, should place greater emphasis on preserving the historical and cultural heritage values of ancient towns and curbing over-commercialization. Such measures will help ensure the diversity and local characteristics of the tourism industry and cater to the interests and needs of local residents.

This study introduces a theoretical model to analyze the homogenization of tourist destinations and offers two novel research perspectives to examine the same issue in ancient towns within Jiangnan water towns. At the same time, considering the multiple negative impacts brought about by homogenization, identifying the facets of homogenization in the ancient water towns of Jiangnan and proposing recommendations to break the homogenization mold has significant practical implications for the sustainable development of the ecological landscape and tourism industry of the ancient water towns in Jiangnan. It should be noted that our conclusions are based solely on the analysis of 15 ancient water towns in Jiangnan. While the six major ancient water towns in Jiangnan have garnered significant attention and generated abundant tourist reviews, the same cannot be said for other ancient towns, where tourist review data might be scarce. Additionally, our study has not fully considered the perspectives of international tourists or reviews from other platforms. Therefore, we recommend that future research endeavors should aim to expand the scope of study and collect more comprehensive data to provide more precise
and targeted recommendations for the sustainable development of ancient water towns in the Jiangnan region. By adopting a more inclusive and comprehensive approach in future research, we can gain a deeper understanding of the dynamics at play in the development and perception of the ancient water towns in Jiangnan, ultimately leading to more effective strategies for their sustainable development.

6. Conclusions

The ancient water towns in Jiangnan, as cultural heritage, hold significant importance. However, the issue of homogenization poses a real challenge to their development. While many scholars have already studied and identified this problem, a definitive solution is yet to be found. In this study, we have taken an innovative approach by examining the homogenization characteristics of the landscape patterns in these ancient water towns. Additionally, we have provided evidence to support the existence of homogenization in the destination image of these towns. By shedding light on both the landscape patterns and destination image homogenization, this research contributes to a deeper understanding of the issue. Acknowledging and addressing these homogenization challenges is crucial for the sustainable development and preservation of the unique cultural heritage represented by the ancient water towns in Jiangnan. The conclusions of this study are as follows:

(1) The physical structure and layout of the ancient water towns of Jiangnan tend to be single and fragmented. The results show that the spatial form of the ancient water towns in Jiangnan tends to be simple and dispersed over time, with an increased degree of spatial form aggregation for the same type of land use. From 2000 to 2020, the homogenization trend of the ancient water towns in Jiangnan in terms of farmland, water networks, and artificial land use has become more prominent, further revealing the existence of homogenization issues with natural tourism resources in the ancient water towns of Jiangnan.

(2) Tourists' image perception of the ancient water towns of Jiangnan is homogeneous. Tourists' perception of the ancient water towns in Jiangnan reveals a convergence of tourist attractions in the ancient water towns, with homogenization evident in two aspects. The first aspect pertains to the homogenization of natural tourism resources, signifying a lack of substantial differentiation in tourists' perception of natural resources across different ancient towns.

(3) Excessive commercialization has led to the homogenization of cultural resources in the ancient water towns of Jiangnan. The second aspect involves the homogeneity of cultural tourism resources to a certain extent, wherein excessive commercialization results in insufficient differentiation of tourists in the cultural resources of different ancient towns. This phenomenon hints at the issues present in the development of tourism resources in the ancient water towns of Jiangnan and also provides valuable references for the future development and management of its tourism resources.

This research examines the homogenization phenomenon in Jiangnan water towns, focusing on two distinct dimensions: landscape patterns and tourist destination image. The challenge of homogenization in tourist destinations is multifaceted, necessitating a thorough and iterative research process for detailed understanding. Given our limited research conditions, we utilized a rather conventional research method yet endeavored to construct a new theoretical framework and analyze the homogenization phenomenon in Jiangnan water towns from multiple perspectives. Understandably, our theoretical framework is poised for further development and refinement: (1) The issue of homogenization in tourist destinations is multi-dimensional. While this research focuses on landscape patterns and tourist destination images, other perspectives can be considered for comprehensive study, necessitating further exploration. (2) This research posits a mutual relationship between the image of a tourist destination and its attractions; however, the underlying mechanism of this connection warrants further investigation. Future studies can probe into this mechanism using methods like questionnaire surveys and in-depth interviews, which include determining influencing factors, uncovering the influence process, analyzing outcomes,
and constructing influence models. (3) The strategies outlined in the discussion section of this study offer a conceptual pathway and guidance to address homogenization in tourist destinations. However, these strategies need to be validated and enriched through further research.

**Supplementary Materials:** The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su151612595/s1, Table S1: High-frequency words in destination image perception of the six major ancient water towns in Jiangnan.

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**References**

6. Sharma, S.; Joshi, P.K.; Fürst, C. Exploring multiscale influence of urban growth on landscape patterns of two emerging urban centers in the Western Himalaya. *Land* 2022, 11, 2281. [CrossRef]
7. Porfyriou, H. Urban heritage conservation of China’s historic water towns and the role of Professor Ruan Yisan: Nanxun, Tongli, and Wuzhen. *Heritage* 2019, 2, 2417–2443. [CrossRef]
51. Li, X.; Zhang, C.; Li, W.; Ricard, R.; Meng, Q.; Zhang, W. Assessing street-level urban greenery using Google Street View and a modified green view index. Urban For. Urban Green. 2015, 14, 675–685. [CrossRef]


54. Marín-Roig, E. Measuring destination image through travel reviews in search engines. Sustainability 2017, 9, 1425. [CrossRef]


57. Crompton, J.L. An assessment of the image of Mexico as a vacation destination and the influence of geographical location upon that image. J. Travel Res. 1979, 17, 18–23. [CrossRef]


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