

**Exploring the experience design strategy
based on visualization method in landscape
context**

February 2023

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Graduate School of
Science and Engineering
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(千葉大学審査学位論文)

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Abstract

The discussion about inclusive tourism in rural areas has been emphasized recently. But developing rural areas in response to inclusive tourism has many problems. Problems can be divided into several categories. Firstly, few tourists travel to rural places because the developed area is not attractive. Secondly, the area is not attractive because the design and services are not suited to the area. Thirdly, the people living in village have low happiness. So, the research aims to propose a visualization method-based dynamic design strategy that explores a new balance between the tourism experience and the local development.

The thesis is started with a research survey. The research used qualitative and quantitative data analysis. First, it explored three groups (developers, villagers, and tourists) and analyzed the relationship and differences between various services and the landscape composition. Second, the thesis introduced the concept of 'servicescape' and user experience. It defined three scene factors and four tourist experience factors through factor and regression analysis. Furthermore, according to the relevant content of landscape perception, we applied a visualization method based on image entropy. We also proposed a visualization framework which is the primary method in dynamic design strategy.

We conducted research and application in two traditional villages in Western Zhejiang, China. First, we subdivided the types into 16 categories according to landscape aesthetics and entropy image. We even introduced the related classification of landscape services (LS) and historical landscape elements (HLE) into the research. Especially in the design project of revitalization in Yuan Touli village, we used the visualization method during the whole design and construction process. We found the method is not an easy way to analyze but also an efficient tool in participant design by the different roles. The visualization method can solve the problems mentioned before effectively. Finally, the thesis expounds on the feasibility of the visualization framework in it exploratory, generative, and evaluative design phases. We also discussed the design definition and described the study's limitations and future research directions.

In conclusion, inclusive tourism and social innovation are closely related. The buildings and landscapes of traditional villages have cultural value and protecting and improving these landscapes enhances the tourism experience and revitalization the local place. Especially after the Covid-19 outbreak, tourism in rural China has shown an increasing trend, and the main implementers must focus on tourists' overall experience and encourage public participation.

Keywords: visualization method, tourist experience design, landscape design, rural village in China

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Chapter 1

Introduction

In 2020, a global new crown pneumonia epidemic changed people's lifestyles. According to the United Nations population statistics, at least 91% of the country's population (about 7.1 billion people) live in the countries in which people live have imposed various restrictions on the tourism hospitality industry [1]. All tourist destinations have also restricted inbound travel for tourists [2]. Travel demand has plummeted due to the disrupted travel services industry. In 2020, the decline rate of global domestic tourist arrivals was lower than the decline rate of income, and domestic tourist arrivals will increase in 2021. According to the representative data of the OTA industry, like Expedia, Booking, Ctrip, etc., the travel demand during the epidemic shifted from outbound to domestic travel, long-term domestic to surrounding local travel, and group to individual travel [3].

The development in the western region of Zhejiang Province in China is outstanding. The Big Data Platform indicated that during the golden holiday in 2021, Hangzhou Lin'an District received 837,200 visitors, with rural tourism constituting 532,000 visitors. This statistic reveals that rural tourism constitutes more than half of the total tourists. Furthermore, new tourism models have been gradually formed, and new business models have offered experiences to tourists, such as the Caoshangang Starry Sky Camp located at an altitude of 1100 meters above sea level, with a comprehensive view of the mountains. Visitors can enjoy stargazing, watch the clouds and early morning sunrise, taste wine, and food, and enjoy music and movies, especially suitable for young people and family tours. From the information above, rural tourism constantly expands other business models based on the landscape. Tourists will be attracted by the good landscape, bringing greater economic benefits. Finding the balance between ecology and economy is very important.

1. General Background

1.1. China's "rural revitalization" policy

The history of Chinese civilization, for thousands of years, has been rooted in the countryside. The countryside carries the main line of the Chinese civilization and farming economy and the essence of the local context. Rural society is the foundation of Chinese society [4]. During the early days of China's rural construction, Liang Shuming, Yan Yangchu, and other intellectuals conducted preliminary explorations of practice that laid a theoretical foundation for rural construction and preserved practical experience. China's rural development can be divided into **six stages**. **The first stage** is the "rural revolution movement" that "the cultivators have their land". **The second stage** is developing the dual structure of the urban and rural areas, primarily with people's cooperatives as the main body. **The third stage** is the small-scale peasant economy that characterizes the family and the joint production contract responsibility system. **The fourth stage** is coordinating the development of urban and rural areas and implementing the policy of "urban giving back to the countryside". **The fifth stage** is integrating the urban and rural development oriented by rural transformation. **The sixth stage** is coordinating the urban and rural areas for development-oriented rural revitalization.

The concept of "rural revitalization" first appeared in October 2017, when the 19th National Congress of the Communist Party of China proposed implementing the rural revitalization strategy. Rural revitalization specifies the ideal vision of achieving *common prosperity* and Chinese-style modernization as a much-needed strategy for the country. Currently, rural revitalization, under the new development concept, aims to seek happiness for the people, rejuvenation for the nation, and focus on the people. The critical goals are "obvious and substantial progress for common prosperity

of all people" and the theoretical key points of "innovation, coordination, greenness, openness, and sharing." Today, China is capable of moving from "rich first" to "common prosperity". Based on agricultural modernization, the rural revitalization strategic thought proposes rural modernization, enriching the connotation and target system of national modernization.

The key data of tourism helps rural revitalization. Tourism's direct and indirect employment population is 79.87 million, and rural tourism resources account for 70%. In the first ten months of 2021, rural tourism received 1.85 billion tourists, and there was an increase of 43.4% year-on-year. In the first half of 2021, domestic tourism revenue reached 1.63 trillion yuan, recovering from the epidemic's impact, and helping economic development and rural revitalization. In the first half of 2021, the rural residents' trips increased by 126.1% year-on-year, and tourism enthusiasm recovered strongly [2].

1.2. Tourism of Traditional villages

Traditional villages are essential carriers of tangible and intangible cultural heritage, providing significant resources to historical stories and folklore in the wrong time and region [5, 6]. China has a long history of agricultural culture; thus, traditional architectural villages were formed early. They are rural settlements formed spontaneously among humans, embodying their long-term interaction with nature. They are also non-renewable cultural resources in Chinese civilization [7]. China's "rural revitalization policy" prioritizes protecting and developing traditional villages [8], so traditional vernacular architecture has attracted increasing attention. Traditional dwellings dominantly manifest past lifestyles and are an essential tangible cultural heritage [9]. Habitat culture originates from human needs for a settled life and people's long-term adaptation to local climate and other natural conditions [10]. As essential assets of traditional Chinese villages, traditional houses are the tangible cultural carriers that support the generation and inheritance of traditional villages [11, 12].

As urbanization accelerates, the progress of modern civilization, the severe excavation of rural areas, and countless traditional dwellings are being replaced by modern buildings or gradually disappearing due to abandonment and disrepair. Meanwhile, tourism essentially supports local socio-economic development. The extensive efforts to develop tourism and vicious competition have led to the gradual disappearance of traditional dwellings in certain areas, challenging existing heritage conservation. Compared to some magnificent historical buildings or traditional urban dwellings, most of the traditional dwellings in western Zhejiang are simply styled and decorated, reflecting the living conditions of ordinary people. The quality of preservation of these traditional dwellings is an essential prerequisite for continuing their usable value. The traditional rural house value should embody the ecological concept and economic value, highlighting the harmony between man and nature and integrating exquisite culture.

Rural tourism is a hot topic in citizens, more and more people want to travel in rural place for the fresh air and special food, although the rural tourism is popular, the destination is not attractive enough and many people don't want to go to the same place twice. Not only the tourists but also the villagers, they are not satisfied with the living environment and low income make them feel depressed. Developers designed many landscapes, services, and facilities that don't match the demand of villagers and tourists. These designs are not what the tourists and villagers want, but developers don't know what they want. So, solving the gap between developers, villagers and tourists is a tricky problem.

As we all know, rural areas have rich natural and agricultural resources, simple folk customs, and profound cultural heritage, thereby providing a new mission and opportunities. Rural tourism development can meet the diversified needs of tourists, promote residents' income, and enhance the public infrastructure and service functions of rural areas. Rural tourism is a regional economic and social activity that significantly affects rural areas' economic, social, cultural, and ecological aspects.

China's tourism market demand is strong, and the supply of traditional tourist destinations is insufficient.

2. Literature review

The rural landscape is to a large extent a historical product, integrating the positive factors between the society and environment [13]. Providing a unique cultural value is indispensable and core necessity for traditional villages. The Chinese government has promoted the rural land consolidation project from top to bottom at an unprecedented scale in recent years, vigorously developing tourism projects with the help of the excellent natural resources in the countryside. The extension and expansion have continued in numerous villages, especially traditional villages [14].

An traditional village is similar to a museum: it contains treasures and serves to convey regional culture and represent history. Therefore, an interdisciplinary exploration and practice is indispensable for current landscape designs. At the same time, dynamic thinking can reduce the hidden risks of the loss of ecological and cultural landscapes [15]. For example, it can help to determine approaches to design and offer service through tourist user experience. The relevant content of the design cooperates with the planning and design of the landscape to enhance the tourist experience. Such designs are creative [16] and can organically combine ecology and human perception and reflect a respect for the ecological environment.

The historical landscape of traditional villages in China is an essential element of such villages. Rural settlements, where people gather and settle down, are also space for people in the city and villages to gather. These landscapes are not merely rural buildings but public facilities for residents and have their own cultural attributes. Consequently, a rural settlement is a community with architectural form and people; it contains various activities, economic activities, and active elements.

2.1. Landscape service(LS)and historical landscape element(HLE) in rural places

Landscape service indicates that human activities, biological and nonbiological factors together shape the landscape. The interdisciplinary concept integrates additional services related to providing space [17]. Tiziano Cattaneo et al. [18] proposed the use of the design as a tool that would serve to revive the lost relationship between the environment, culture, heritage, and citizens to promote inclusive tourism as a means for social integration. Tourism promotes local development, while increased tourism infrastructure provides access to new areas. Rural development is driven by rural tourism. With the recent increase in the number of tourists in traditional villages, many tourists have shown great expectations from traditional villages. From their visits, they can learn about the local people and traditional local culture. the wisdom of traditional culture cannot be ignored [19].

The landscape, being the core of tourist attractions, acts as the start and end factor attracting tourists and prompting them to evaluate the experience as satisfactory [20]. Haines-Young and Potschin grouped landscape services [21] and landscape service (LS) classification under the Common International Classification of Ecosystem Services (CICES):

- Provisioning: nutrition, material, energy, daily activities
- Regulation and maintenance: regulation of wastes, flow regulation, regulation of physical environment, regulation of biotic environment, regulation of the spatial structure
- Cultural and social class: health, enjoyment, self-fulfilment (personal), social fulfilment.

Table 1-1 Classification of landscape services: description of the new services and their related concepts (from Vallés-Planells et al. [17])

Class	Group	Definition	Concept
1.Daily Activities	Place to live	Provision of a space for residential location, a home	Carrier functions Provision of

	Place to work	Provision of open spaces or urbanized areas where people develop their job	space
	Place to move	Provision of spatial communication. it is not only related to transport networks but also to open spaces that allow people to commute, travel, or access other services	
2. Landscape Aesthetic perception	Connection of spaces	Ability to facilitate ecological, visual, or functional connectivity between different areas	Connectivity
	Provision of spatial complexity	Related to the degree of diversity and richness of landscape elements that might improve possibilities for exploration, resilience, and visual absorption capacity	Diversity Heterogeneity complexity
3. Enjoyment (mostly for tourists)	Passive enjoyment	Enjoyment of attractive vistas, a quiet place to read a book, the possibility of seeing wildlife, or cultural heritage	Aesthetic Appreciation values, and heritage
	Active enjoyment	Related to more dynamic ways of enjoying spare time like opportunities for hiking climbing, gardening, hunting, fishing, or providing a place for children to play.	Recreation, tourism , and ecotourism
4. Personal Fulfilment (mostly for tourists)	Way-finding	Provision of cues that enhance spatially orientation, the sense of where one is, and how to get where one is going	Orientation
	Didactic resources	Opportunities to learn about rock formation, flora and fauna species, past civilizations, or traditional farming practices.	Education. Educational values, learning
	Spiritual experience	Provision of sacred places for religious practices or sites connected to legends or myths	Spiritual experience and religious values
	Source of inspiration	Inspiration for art, literature, music architecture cinema, or advertising	Inspiration for culture art. and design
5. Social Fulfilment (mostly for local people)	Social interactions	Provision of social surroundings separate from the two usual social environments of home and the workplace that provide opportunities for social encounters	Community activities, social relations
	Place identity	Contribution to shaping of community identity by providing icons and distinguishing it from others	Sense of place identity, cultural diversity, and identity
	Sense of continuity	Provision of stable reference points through the life course	Sense of history, sense of continuity

According to Tveit et al. [22], the Historic Landscape Element (HLE) is an essential bearer of collective services and integral to the basic cultural landscape. The term landscape is frequently used in the scientific literature on ecosystem services. Landscape services and ecosystems are often used interchangeably [23, 24].

The new LS classification is an integrated and interdisciplinary approach [25]. Its new taxonomy of landscape services is built including 18 groups, with its associated definitions and concepts. We mainly highlighted the Enjoyment which is closed to user experience in the original table by Valles-planells et al. [17]. Regarding Historic Landscape Elements (HLEs), the authors revised and modified the tables presented by Bastian et al. [26] Tiziano Cattaneo et al. [18] add several historical elements from the Chinese context. It provides a better understanding of local traditional landscape and culture.

Table 1-2 Examples of historical landscape elements (HLE): categories and types (modified and adapted to the Western Zhejiang context from Bastian and Walz [27] and Cattaneo et al. [18]).

HLE categories	HLE types (examples)
Agriculture	Old rice paddies and terraces, vineyards, meadows with scattered fruit trees, hedges, stone ridges, old agricultural field terraces, wet meadows, heathlands
Forestry and mountain	Pastoral woodlands, sacred mountain
Settlement types	Single-street villages, scattered settlements, compact settlements
Traffic	Sunken pathways, water pathways, tree-lined avenues, narrow gauge railways
Mining	Relics of old ore or coal mines, relics of peat cuts, former stone or chalk quarries
Processing of food and materials	Wind and water mills, old warehouses and silos, workshops of wood, stone, ceramics, etc
Military, security, administration and representation	Battle fields, ramparts, fortresses, castles, walls
Building types	Buildings in the local architectural style, manor houses, bamboo houses, gardens, ruins
Religion	Monasteries, cemeteries, temples
Fishery and hunting	Fishery and hunting

2.2. Visualization methods based on Landscape aesthetic

Various forms of visual communication have a long history in environmental management (Table 4-1), especially in landscape architecture and planning [28]. Visualisation has a dual advantage: it can realistically improve virtual viewing ability and the degree of interaction while significantly reducing related costs. The use of visualisation as a participatory tool continues to expand. The opportunities and demands for visualisation are increasing with the participation of public members and the development of the landscape planning field, covering a more comprehensive range of issues. Beatrice John et al. used decision-visualisation environments to obtain an active development network and form an efficient discussion community [29]. They also organised activities and shared their indirections, made suggestions for design and planning, and determined whether the differences in viewing behaviour were complicated [30]. The difference in degree is relative, while the complexity is represented by the spectral entropy of the photo. The eye-tracking experiment serves to measure visual behaviour when observing photos. More urbanised landscapes offer more extensive and decentralised exploration [31].

Table 1-3 Development of visualisation in the landscape

Years	Methodology	Literature
1960	photographs and photomontages have been widely used	[30];[32]
1990	CAD, GIS and landscape visualization software enhanced the possibilities for digital representation	[33]
In the past decade	the availability of free virtual globe software has opened up additional opportunities for real-time display, particularly given the scope for customization and incorporation of 3D buildings or vegetation	[34]
Nowadays	CAD or GIS database and then generate three main types of 3D outputs. 1. rendered still images (or scrolling panoramas) from defined viewpoints, 2. animated sequences (showing fly-throughs along specified paths or changes over time), 3. real-time models (or virtual worlds) where the user has the ability to freely navigate a landscape	[35];[33]

Using the entropy methods also combine different approach to analyse a specific scene. Pearson's correlation coefficients calculated between the eye-tracking metrics and the inverse function of the spectral entropy. These results confirm the findings of the analysis performed on the different urbanization classes as they also indicate an increase in visual exploration when the visual complexity of the landscape image increases. Entropy is relevant to applications in environmental aesthetics [36]. L Dupont, et al. computed if differences in viewing behaviours are related to differences in complexity, expressed by the photograph's spectral entropy [31]. Numerous studies have shown that image entropy is strongly correlated with rated visual diversity and complexity. Consequently, entropy strongly indicates subjective impressions of visual complexity in landscape scenes. Stamps mentioned that numerous studies have demonstrated image entropy to be highly correlated with rated visual diversity and with visual complexity [37]. Entropy, thus, strongly indicates subjective impressions of visual complexity in landscape scenes [38]. This conclusion is relevant for our study, which is concerned with the visual complexity of a landscape view as perceived and experienced by people.

2.3. Servicescape and Tourist Experience Design

Kotler [39] observed that the service environment affected consumer behaviour and used the term 'atmospherics' to describe a service environment carefully designed to emotionally affect the consumer and thereby enhance consumer intentions. In his study on service environments, Bitner [40] used the term 'servicescape' to define the specially designed and controlled elements of the physical environment of a service venue. The term 'servicescape' has been gradually accepted by researchers and has become a common term for service environment research. Subsequently, the meaning of service scenario has been expanded to include the physical environment of the service place as well as the social interaction and natural elements [41-43] of the servicescape. Furthermore, the servicescape model was extended by dividing the servicescape into the physical and social dimensions. Symbolic and natural dimensions can be considered as types of physical dimensions. Pinen & Gilmore classified customer experiences into four categories based on the tourist's level of involvement and motivation: entertainment, educational, escape, and aesthetic experiences [44].

Concerning tourist experience, Wang et al. [45] examined wetland ecotourism and obtained three dimensions of aesthetic experience, emotional experience, and behavioral experience through a regression analysis based on the Schmitt strategy module. In addition, the content and classification of tourism experiences vary for research contexts. Agapito, Valle & Mendes [46] investigated rural tourism experiences and divided them into visual, auditory, and tactile according to the sensory dimensions. In their study on nature tourism experiences, Vespestad & Lindberg [47] divided the content of experiences into authentic, entertainment, presence, and socio-cultural.

Hauberg [48] and Roggema [49] define design research as "an academic study that explores through design, develops projects, and investigates different materials in which a design is performed - sketches, maps, and others" [49]. According to Hauberg [48], "it is used to describe the various ways in which design is interactive when new knowledge about the world is generated through designing." "The approach contributes to the generation of desirable and unexpected urban perspectives, thereby replacing modifiable but less desirable urban developments" [50]. According to Nassauer and Opdam [51], design contributes scientific knowledge to decision-making by scientists and practitioners, implying that the mode-process paradigm should be applied to design practise.

3. Study area

The western region of Zhejiang Province in China comprises three topographies: hills, basins, and mountains. The local area brings together settlement, living, Hakka, and architectural cultures.

These factors make western Zhejiang form a cultural circle with unique settlement, architectural forms, and customs.

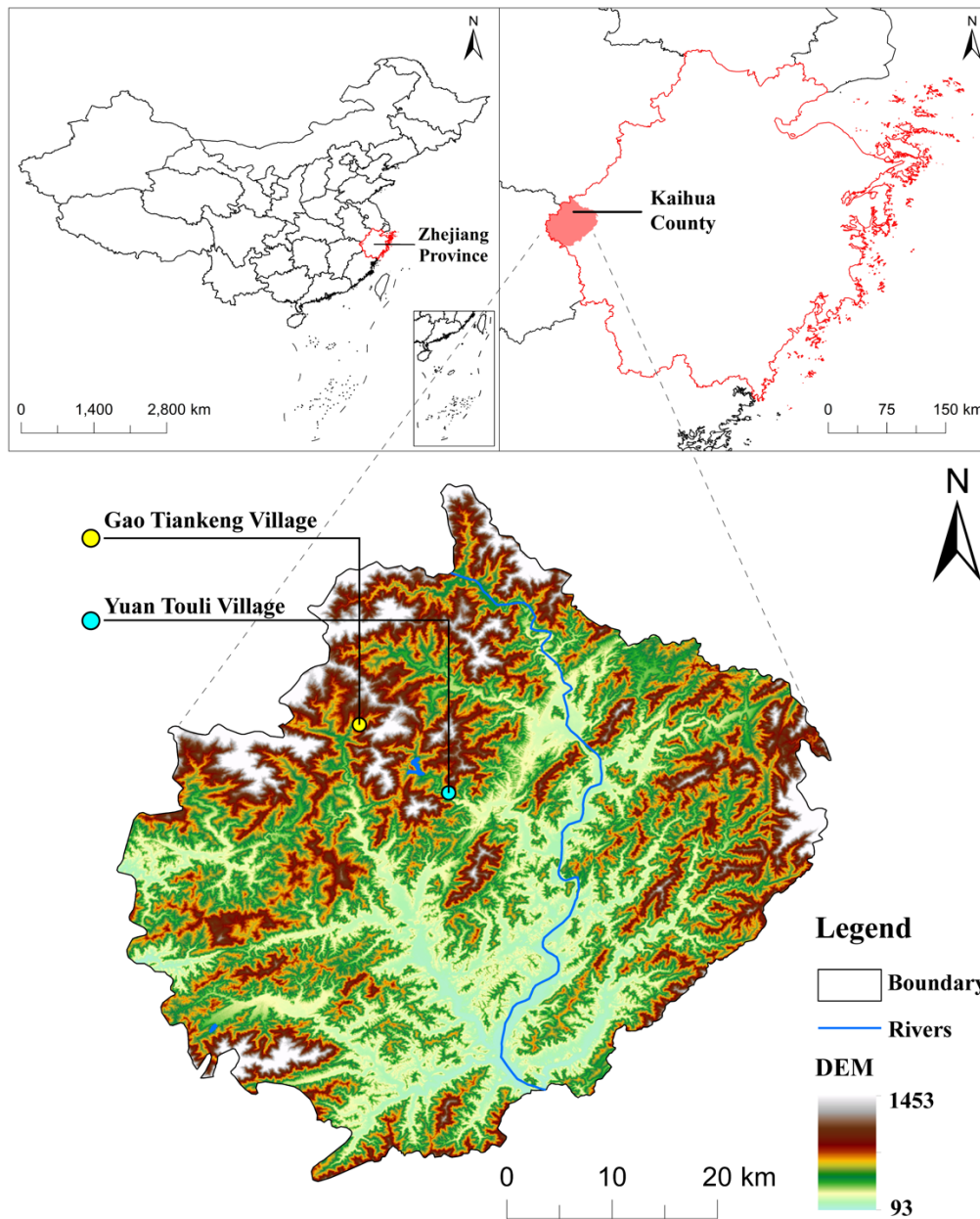


Figure 1-1 Kaihua area map and topographic map

Kaihua County is located in the west of Zhejiang Province, northwest of Quzhou City, the source of the Qianjiang River, and the junction of the three provinces of Zhejiang, Anhui and Jiangxi (Figure 1-1). Between 37°50". The terrain of Kaihua County is dominated by hills, known as "nine mountains, half water, and half fields." The whole terrain is high in the northwest and low in the southeast, and the central and southeastern parts gradually transition from middle mountains to low mountains, high hills, low hills, and small valleys. Kaihua County has a subtropical monsoon climate with four distinct seasons, mild and pleasant. The annual average temperature is 16.4 °C, the annual average rainfall is 1814 mm, and the sunshine hours are 1712.5 hours. The two villages in this study are traditional villages located in the mountainous area of Kaihua County, namely Gaotiankeng Village and Dayuantou Village (Yuan Touli village). The two villages have richness tourism resources, including special natural resources and humanistic resources.

1. Gao Tiankeng Village (Figure 1-2) has the original regional ecological landscape. The

village was transformed into a cultural and creative homestay, catering, stargazing, camping, research, and other tourism de-signs without affecting the aboriginal villagers. It is a unique tourist village. "Embroidery" kung fu in Kaihua preserves the original texture and promotes integrated development of the cultural tourism industry through cultural heritage. It includes building wineries, tofu workshops, tea workshops, etc. In November 2021, the Village received a total of 41,000 tourists, a year-on-year increase of 36.1%. It drove the industrial tourism operating income of 2.47 million yuan, a year-on-year increase of 31.2%. So, how to balance the tourists experience with the local people's daily life is the challenge.

2. Yuantouli Village (Figure1-2) has 148 people according to the original household registration. This village has a beautiful ecological environment and well-preserved traditional homestead. The villagers have reclaimed land and planted various trees, but its remote location limits the economic benefits. The township government highly supports economic activities. Yuan Touli's historical and cultural village project was started in 2019. Micro-renovation has been conducted to preserve rammed earth houses and increase good living facilities to form a "source of historical and cultural village scenic spot". The project was launched in July 2022. Qing Shui fish, native honey, organic tea, and sorghum wine are available in high amounts in this village located on the mountain..

It started to open to tourists in July 2022. This traditional village, hidden in the deep mountains, has been revived with vigor and vitality. The occupancy rate of homestays in July and August, 2022 was around 95%, and its turnover in August was more than 700,000 yuan. The food and beverage ingredients used in the homestay are purchased from farmers in the village. A stable supply chain of agricultural products like Qingshui fish, native honey, organic tea, and sorghum wine has also been formed.



Figure 1-2 google map, rendering and photos of Gaotiankeng Village and Yuan Touli Village

4. Research Framework

4.1. Research purpose

The research object of this paper is the dynamic design strategy based on visualization methods (entropy image), which aims to narrow the gap between people and the environment by exploring the balance between user experience and the ecological environment. Dynamic strategies focus on temporal and spatial dynamics. Tourism experience is a process, and the tourism experience in a region is a whole. We suggest a holistic design strategy to research tourist experience [52]. The new human-environment relationship type will promote regional development.

Figure 1-3 Show the research scales and purpose, we focus on the landscape of the ecosystem and the tourism experience of the economy and try to use the visualization method way as the main part of design strategy to enhance the balance of ecosystem and economy. So, in conclude, this study uses the design innovation to Promotes the sustainable development of ecology and economy. And This study adopts a solution-oriented way of thinking. Visualization methods guide rural tourism experience and landscape design.

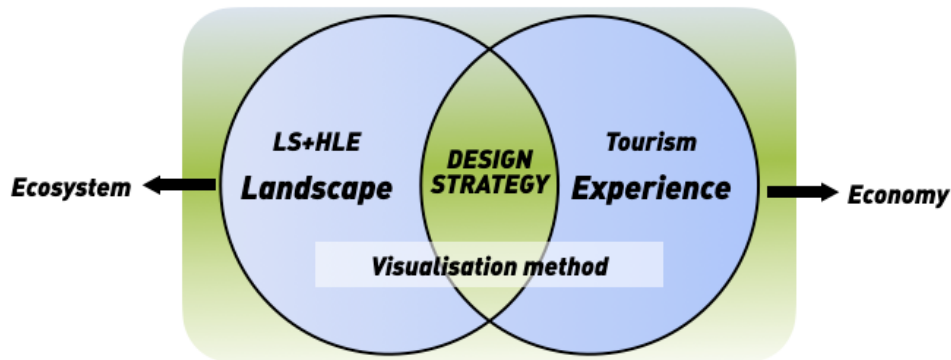


Figure 1-3 Research scales and purpose

Most ecosystem services assessments of landscape attributes focus on readily available data, namely, land cover. However, when simple types and raw data are used, the results may not be realistic [53]. Landscape properties practically include both abiotic and biotic elements. Woźniak [54] introduced the term service landscape potential to emphasize that the probabilities of willingness to satisfy needs are unequal, a step narrowing the gap between supply and demand. Intrinsic landscape potential (purely the supply side) describes the non-spatial distribution of opportunities. In tourism, service providers can combine landscape services with prearranged service delivery to improve the experience. This study proposes a dynamic design strategy maximizing the potential landscape services to improve services based on Landscape service user experience. For designers, using visualization improves the research and design process efficiency to create correct and functional designs.

The research concept progress is presented in Figures 1-4, Various landscapes have distinct properties. The intrinsic landscape potential is defined based on the possible outdoor leisure activities. Tourist willingness to undertake activities is the service landscape potential, which is markedly less than the intrinsic landscape potential. Satisfaction is an important element in the concept of tourism experience.

Therefore, designing inclusive tourism experiences, especially in rural areas, requires viewing tourists as consumers and participating in experience building. In this study, the overall experience was explored using visualization methods based on tourism experience design theory. In addition, tourists' dynamic perception of landscape aesthetics was evaluated. The effects of landscape services to tourists and the experience patterns affecting tourists during rural tourism are presented in this study. The findings will help designers and stakeholders apply landscape services and visualization methods to evaluate the correlation between landscape services and user experience.

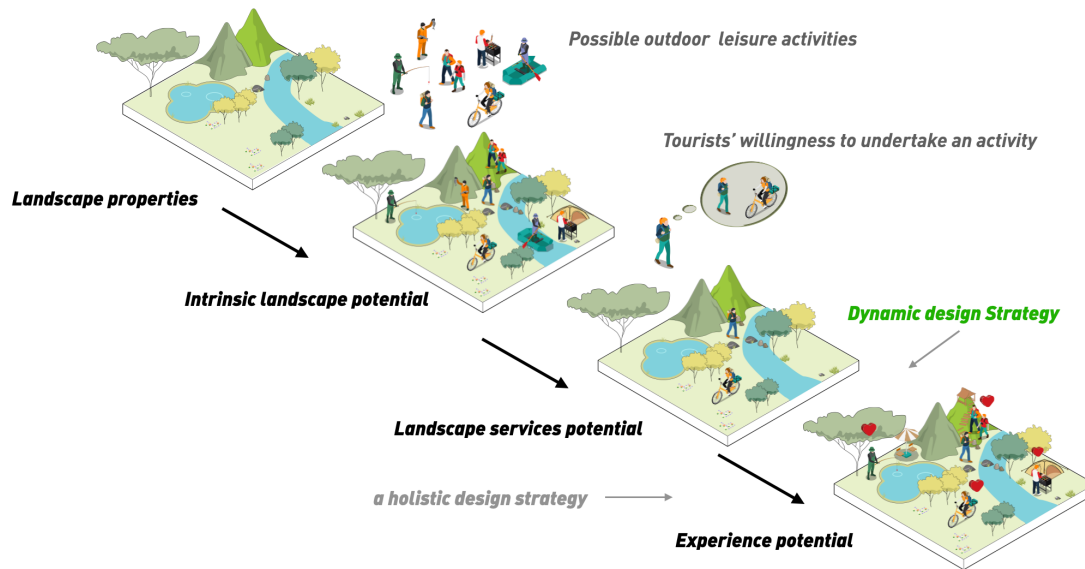


Figure 1-4 Framework of the research concept process

4.2. Research Significance

Historically, most research on traditional western China villages focused on village interiors, and more attention was given to internal village space than to external space [55], mainly crafted surroundings, structure tectonics, building typology, and the entire village formation. Considering the village group, this research adjusted the research perspective from landscape space to experience space, from single object design to overall experience design. The study of tourism experience logically extends the study of landscape planning in rural. We analyze the relationship between people and the environment from the user experience perspective and propose a design strategy to guide planners, designers, and managers on traditional villages through conservation and organic update.

From a historical research perspective, combining LS with HLE and analyzing it from the perspective of landscape aesthetic perception is an essential and effective complement to traditional village research, providing meaningful and comprehensive insights. Research on traditional villages usually focuses on village landscape planning and inclusive tourism while less on the combination of tourist experience and perception. However, the visualization system can quickly provide feedback and analyze the information on aesthetic perception and tourist experience. This study provides a fundamental tool for a more comprehensive study of tourism experience and landscape aesthetics in the future.

From a realistic perspective, the visitor's preference for the landscape helps formulate the design strategy and guide the design. The dynamic design strategy proposed in this study can reduce the damage of traditional landscapes and bridge the gap between visitor experience and planning and design. The dynamic strategy based on the overall design strategy can give more comprehensive feedback on the relationship between tourists' experience and landscape and promote people's tourism experience and historical landscape protection awareness through design (including landscape design and service design, etc.).

From a future development perspective, the research on design strategies mainly focuses on the relationship between people and the environment, providing theoretical support for the future protection of traditional villages and inclusive tourism development. Traditional villages have historically been relatively closed. Under China's urban and rural planning background, inclusive tourism deserves further attention. At the same time, it is the key to the dynamic design strategy to promote the development of the local tourism industry, help local villagers have better economic

income, and promote the improvement of the tourist experience.

4.3. Overview of the thesis

This study mainly addresses the premise of a virtuous cycle of the ecosystem, improving tourism and landscape services to promote locals and sustainable development, and enabling humans to obtain better landscape services through experience design. Based on the related theory of entropy image and landscape perception, a method of experience visualization was also proposed, analyzed, and applied (Figure 1-5). It mainly consists of four studies that are, respectively, in the second, third, fourth, and fifth chapters.

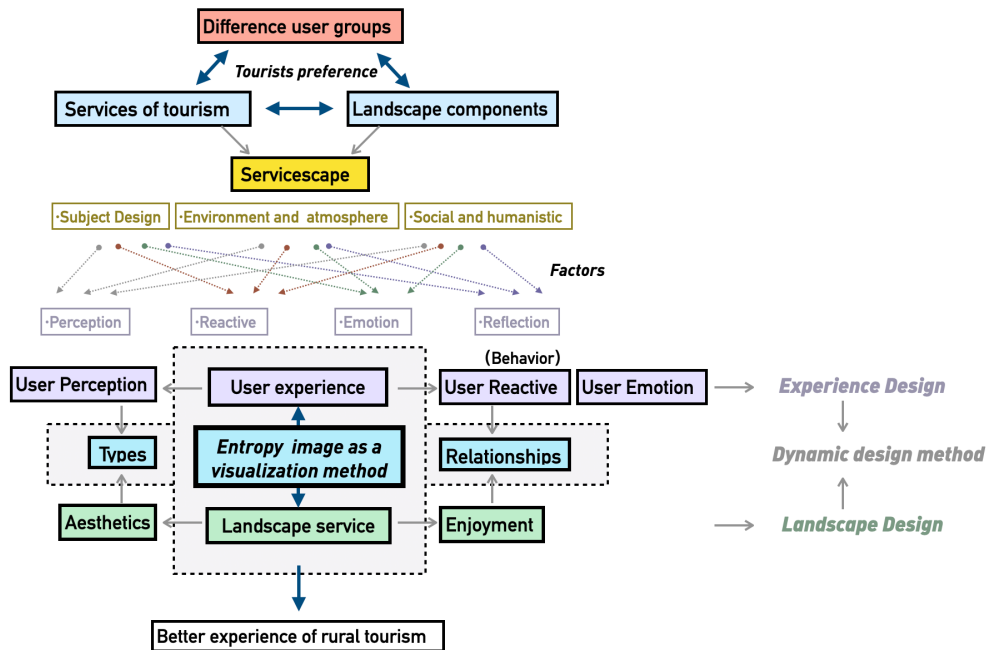


Figure 1-5 Framework of the research

Chapter 2 is about basic research. The summary of design practice and literature research, the service scenarios (7 types), landscape composition (10 types), and main groups (government, villagers, tourists) of rural tourism that can help. The research uses questionnaires to study the landscape preferences of various groups for various service scenarios. The results showed that people highly preferred scores for native and necessary landscapes and gave low scores for exotic and conventional landscapes.

Chapter 3 further extends the second chapter. It introduces the term "servicescape" where we analyzed the primary factors and the relationship between servicescape and user experience. The chapter focuses on dividing servicescape into the main design, environmental atmosphere, and social and humanistic factors through variance, regression, and factor analysis, and divides user experience into perception, emotional, and reflection factors.

Chapter 4, according to the relevant landscape perception, we applied a visualization method based on image entropy and proposed a visualization framework that included landscape aesthetic type, landscape service combination, and tourist emotion color.

In Chapter 5, we researched and verified two traditional villages in western Zhejiang, China. First, we subdivided the types into 16 categories according to landscape aesthetics and visualization. The relationship between passive and active enjoyment is subdivided into eight combinations, providing design suggestions.

Chapter 6 according the results before, we introduce how to use the results to do the design

decisions in Yuan Touli village to develop local tourism. Then, discussing the design strategies to develop traditional village tourism and conclude the advantages and limitations of the research. In the post-Covid-19 world, the design paradigms are shifting, and there are new upcoming opportunities and challenges in rural tourism. Finally, it provides a general discussion of the overall results and concludes the paper.

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Chapter 2

Exploring the Tourist Experience by Analyzing the Relationship between Landscape Composition and Services from Different Roles Demand in Rural Areas

1. Introduction

Our research aims to understand the prerequisites for using these approaches in landscape planning and build a design approach framework that integrates them in the planning process.

1.1. Rural design in the Chinese context

In China, 70% of its population lives in villages or underdeveloped interiors, making it a nation of villages. Since China is one of the most populated countries, its 70% implies 900 million people [1]. The villages have no industrial force, with pastoral lands providing space for the increasing birthrates in its countryside. Tourism may positively impact the local community [2]. The revitalization efforts in the rural areas acknowledge that the rural tourism industry has a solid industrial driving force [3]. The Chinese government aims to modernize and civilize the countryside to improve the urbanized country. The government is rapidly progressing with efforts, including constructing roads, schools, and agriculture development. The government acts at the local and national level in the participation of tourism sectors, regarding it as a Top-down strategy [4]. The government is the leader and sponsor in rural design and planning practice, but the service object is villagers and tourists. The villagers are also stakeholders and service providers in rural tourism strategy.

For China's rural tourism, the developers are led by the government, and enterprises, artists, designers, etc. are the partners and cooperate with villagers and tourists to promote rural tourism development. The perspectives and emphases of the three are different, as follows:

Developer perspective: whether to attract tourists, increase fiscal revenue, improve living conditions, and protect the ecological environment.

Villager perspective: daily life, income situation, interpersonal communication

Tourist perspective: whether you are satisfied with the trip, enjoy the scenery, experience folk customs, communicate with local people, buy local products, and the price is reasonable.

Therefore, the joint corporation of the government, tourists, and villagers are significant from perspectives. What can the government, villagers, and tourists do in the rural design to promote tourism? This research helps us understand these three parties' roles in that sector and their relationships.

1.2. Landscape Preference

Landscape preference is a part of landscape perception, which reflects the comprehensive results of a series of perception activities, such as the public's emotional cognition of landscape. Knowing landscape preferences helps to explore which landscapes are most popular based on the user's comprehensive evaluation results of landscapes [5]. Previous studies on landscape preference have mainly focused on the relationship between landscape preference and landscape elements [6]. Among natural landscape features, total area and distance to water were given higher importance, indicating that people prefer continuous overall landscapes and water-friendly landscapes[7].

Numerous studies have shown that their sense of humanity will be better when people enjoy a continuous and magnificent natural landscape, such as continuous rice fields and a sea of flowers and forests [8].

Keyi Cai et al. [9] found that the best combination of landscape elements is an open landscape with flowing water, a shady plaza, rich vegetation, roads, and seating. A previous study found that the general public prefers to carry a natural 'feel' and diverse vegetation [10]. At the same time, this type of landscape ensures accessibility and recreational activities, which helps to strengthen the dependence on the site[11], thereby increasing the public's preference for landscape. According to the results of this study, landscape architects should pay attention to the combination and balance of natural landscape elements and leisure facilities. Regarding these study methods, most landscape preference studies are conducted with photographs, asking respondents to rate how beautiful or preferred photographs of different landscapes are. In recent years, photo simulation has also conducted landscape preference tests[12].

This chapter classifies the service types in the current rural tourism scene and summarizes the scene types and landscape composition types in different service types. At the same time, the three most important groups of people in the countryside are summarized. The relationship between these three groups of people is closer than in the city. The operators, including the government and designers, should provide opportunities to foster relationships with tourists to enhance their engagement [13]. In rural construction and tourism, the flexibility of the scene is very large. Service scenes may contain the same landscape but bring people different feelings. This chapter starts with the user's feelings, considers different groups of people and service types, the relationship between the two, and the landscape composition, and also summarizes the design opportunities from the user's preference for landscape composition in different scenarios.

2. Methodology

This chapter describes every method to conduct the study (Figure2-1). It describes the population, techniques used, the sample size, and the sampling techniques. It also includes the data collection and analysis method and its stages. (Appendix 1)

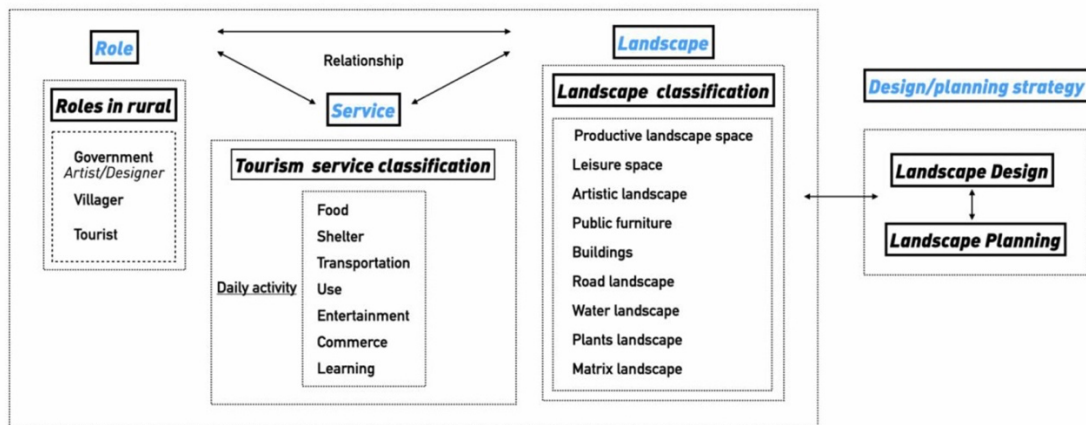


Figure 2-1 Methods of the research

Our method depended on the research questions that we focused on analyzing the relationship between landscape composition and the service from rural group roles. The research may not be precise but answers our questions. It gives some design framework in the rural landscape design and planning in a tourism context. We found the descriptive research design suitable while focusing on our analysis. We focused on:

- The discussion on the main roles of different groups in rural tourism development: the government, the villagers, and the tourists.

- The classification of rural landscape composition and services
- The relationship among the roles, landscape composition, and services helps the rural design and planning strategy.
- Furthermore, (1) What scenes can be formed by the combination of different landscape types. (2) What services can be provided by different scenes. (3) The degree of demand of different people for the landscape composition of different service scenes.

We can see in practice and the interviews that the government, tourists, and villagers have different ideas and needs. This requires tripartite contract cooperation to form a harmonious landscape state. This paper summarizes the rural design planning strategy map through practices and literature reading, reflects the focus on landscape design and landscape planning with different services, and proposes the relevant design points. The data were collected through questionnaires from the villagers, government officials, and tourists using a background study and evaluating the interrelationships. Further, personal interviews were also conducted for the three groups. A sample size of 561 participants was estimated at the beginning of our data collection stage. We interviewed and provided the questionnaire to the villagers, the government officials, and the tourists by carefully assessing the landscape. In total, 561 people were targeted to begin with the investigation that helped in the data collection and analysis. They were asked to score the need of landscapes or services, based on actual experience related to rural tourism. The questionnaire is filled based on an 8-point scale, where 8 means highly needed and 1 means not needed at all. Data analysis: The SPSS 25.0 software was used to conduct the analysis. We analyzed if the difference between rural and urban tourism is due to the landscape composition and services or the gap in our three groups; government, villagers, and tourists. We used statistical models for data analysis and used the Bertin display primitive classification model for data representation. Then, we concluded the design preference points of all groups.

3. Discussions on the Roles of in Tourism

3.1. Governments groups, villagers, and tourists

(1) Developers groups

The situation is complexed in China, the top-to-down policy is the main way. The government is the developer group that cooperate with businesses, designers, artists, architects and so on. The developer groups should comment on the revenue from tourism resources, while the villagers should comment on the assimilation of tourism resources into their daily lives. For Chinese rural areas, tourism is a major development tool. The government plays a major role in its development process. They oversee investments, plans, entrepreneurial stimulation, investment stimulation, social tourism, management, research, education, and public training [14]. The relationship among the government, designers, and artists, in China's rural practices, is very close. We understand the necessity for government involvement in tourism development [15]. Their involvement in tourism usually includes formal ministries and other institutions. Cooperation through the different institutions is always imminent [16].

(2) Villagers

Villagers are living in their own homes not temporarily, so they consider their daily life. Participatory Rural Appraisal (PRA) [17] emphasizes public participation. Its main advantage is it provides opportunities to researchers/authorities in building communities. One of PRA's specific characteristics is to be united with the local community. This can happen overnight; living in the village for a while, working with the villagers, doing their household chores, farming, fishing, etc. The villagers provide services to the tourists, and they negotiate and determine the remuneration standards for different services. They select a tourism leader from the villagers for daily rotation

and management of tourism activities with the travel agency. Residents want to be the primary decision-makers for their communities as they share common future responsibilities for their areas. Their participation in rural tourism improves rural employment and provides participants with an additional income [18].

(3) Tourists

Tourists focus on their experience in travel in rural, actually rural tourism is not equal to sightseeing place, travel in rural are likely to visit others' hometowns or somewhere can give the space to relax and avoid the noisy of city. In tourists' perspective, experience and daily life is the most concerned points. The tourists' role depends on their education or civilization and their economic level. Their contribution improves tourism or builds other economic sectors. The best role they can play is properly utilizing the available resources of their tourist areas for leisure, entertainment, or education. Landscape services are the contributions made to landscape and its services for human well-being [19]. The good experience of tourists is a crucial factor to show rural development. Pull motives are more important to domestic travelers.

3.2. Relationship between the roles

Figure 2-2 shows that the government and the services of the designers and artists directly affect the villagers and tourists since they experience it first. The interaction between villagers and tourists promotes the communication of culture and design in design and planning. Villagers and tourists will include their needs, ideas, and problems on the government team that stimulates the developing design and planning. The mutual communication between villagers and tourists and understanding the village's cultural customs can also increase user experience.

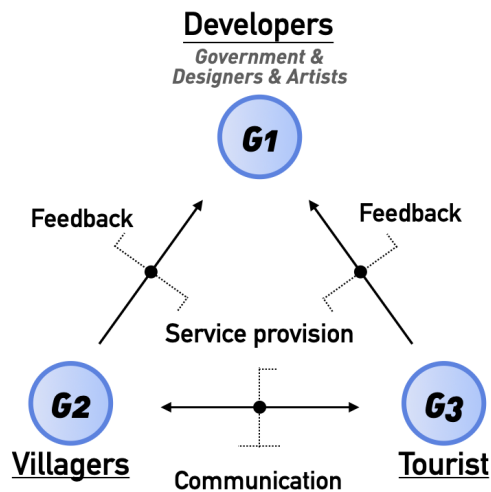


Figure 2-2 Relationships between government groups, villagers, and tourists in rural tourism

The government provides most of the funds to develop the tourism sector. When the government mishandles tourism kits, the tourist sector may stall for a moment. Government officials look for artists and design teams for rural planning and design to enhance the artistic atmosphere. The government dominates this top-down process. Our media is rapidly developing, and several spontaneous artistic creative activities are also in progress. The government staff, designers and artists belong to the design planning group. This solves the obstacles of developing the tourism sector, including a shortage of funds and human resources, poor community participation, poor monitoring evaluation, and supervision of the money allocated to the project. The government

provides a politically peaceful and suitable economic climate to improve tourist attraction. The government in the developed countries plays a minimal role in the tourism sector. The underdeveloped countries' government participates a lot, i.e., implementing laws and all activities happening in the tourism sector comes from the government. While top-down policy implementation drives the efficient completion in China, the focus should be to ensure that the process and the outcome of these projects are of high quality. There has to be a recognition and a positive perception of this quality among the public [20].

4. Classification of Landscape and services in rural tourism

4.1. Classification of landscape

Landscapes are of different varieties and types (Table 2-1). We modified and adapted the categories and types to the Chinese context [21]. The main parts are the cultural landscape and natural landscape. The classification of the landscape is essential for communication issues and research. The components used for classification include water and water views, infrastructure, land covers, and landform of any physical element of a geographical feature. The classification character defines people inhabiting a specific place and differentiates one tourist site from another. Landscape classification acts as a backdrop to the people's lifestyle in a specific area. Every rural area has a different landscape classification, and each classification has its aesthetic value [22]. A landscape can be a farm, a park, a desert, a coastal region, mountains, islands, polar regions, etc. Even if indicators for landscape types are transferable between landscapes, one needs to consider the local context while interpreting indicator values. The rural landscape is a valuable resource that supports multiple functions, and its structural changes will imply subsequent changes to the supported services [23].

Table 2-1 Landscape classification in rural places

Landscape classification	Examples
Productive landscape space (outdoor)	Aquaculture system space, animal feeding space, botanic garden, plantation garden, large area landscape plant, agricultural productive landscape space, agricultural facility landscape space
Leisure space (outdoor)	Square, pavilion, corridor, lawn, garden, greenhouse, market, gallery, stage
Artistic landscape	Landscape sculpture, signboard, sign, lamplight
Public furniture	Seat, table, garbage can, street lamp, fence, fitness equipment, sunny or rainy facilities, cook kit
Buildings	Residential buildings, public buildings, productive buildings
Residential buildings	Residence with courtyard
Public buildings	Hotel, reception center, restroom, stadium, various exhibition halls, rental agency, parking lot, station, supermarket, laundry tray
Productive buildings	Seed storage, livestock farm, food and feed processing station, tractor station
Road landscape	Entrance to a village, street, lane, bridge, plank road, walkway, greenway
Water landscape	Water gap, well bay, pool, ravine stream, sea
Animal landscape	Mammal, amphibious animals, pets
Plants landscape	Wood, bamboo forest, traditional trees, nature plants, landscape plants, courtyard plants
Matrix landscape	Farmland, rock, sand beach, mountain, wood, lake, sea, land, terrace

4.2. Classifications of seven main services about tourism

Tourism is an economic sector that keeps improving over the years. There are classifications of Tourism services- distance and duration of stay, the tourists' origin, means of transport, and the conduct of stay, interaction of travelers with the tourist area, the remuneration, age, and the number of tourists. After many design practices and rural tourism cases, we found a total of seven types of daily services (Table 2-2), including food, transportation, housing, usage, entertainment, commerce, and learning. These seven types affect all aspects of peoples' life.

Table 2-2 Services classification in rural tourism

Service classification	Examples
Food	Picking, tasting, cookout, ordering, self-service, barbecue, DIY cooking
Accommodation	Accommodation, camping, rest
Transportation	Sightseeing, traveling
Usage	Theme activities, business communication, interactive experience, hand-made experience, reception, stage performance, outdoor movies, etc. (used for specific theme activities), etc.: Purpose/commerce
Entertainment	Contact, feeding, appreciation, fishing, fish and shrimp catching, leisure and entertainment, cultivation, picking, contest, sports activities, playing, dance, climbing, swim, drifting, drilling
Commerce	Offline sales, online sales, trial experience
Learning service	DIY activities, activities, hand-made experience, explanation, learning, exchanges, reading

5. Results

We used the SPSS 25.0 software to verify the reliability and validity of the 561 qualified questionnaires.

5.1. Reliability and validity test

Analysis of the Cronbach value can be obtained from the reliability and angle analysis, and the reliability coefficient value is 0.878, which is greater than 0.8, thus indicating that the reliability of the research data is very high quality. When performing a validity test, if the KMO value is higher than 0.8, it means that the validity is good; if the value is between 0.7 and 0.8, it means that the validity is good; if the value is between 0.6 and 0.7, it means that the validity is good. In general, if the value is less than 0.6, the validity is poor; the result is the KMO value is 0.832, and the KMO value is higher than 0.8, indicating that the data validity is very high.

5.2. Mapping the design framework

First, we conducted field research and interviews on the leading areas of rural tourism in China. According to the classification of landscape services, daily activities in the provision, we summarized seven main services: food, housing, transportation, use, play, business, and learning. In our preliminary research, we conducted random interviews with tourists. What are the most anticipated aspects of rural tourism? Through the summary of the keywords, 75.4% are to feel the beautiful scenery and aerobic breathing. 74.7% interviewees choose to understand local culture and regional customs. 49.6% choose taste fresh farm food. 43.3% buy local specialty products. 36.4% experience a slow pace of life. Landscapes and services are crucial for tourism activities in rural scenes. 82.2% of the service is mainly for play, 63.1% is for the service of catering, 35.7% is for the service of accommodation, 39.4% is for the provision of specific matters, 23% is for the service of travel and transportation, 9.8% services are mainly based on consumption and purchase, and 4.1% are services based on learning. The choice of play and catering accounts for more than half of the total, the service, accommodation and travel used range from 20% to 40%, and the consumption and study are less than 10%. According to the human and natural landscape classification, it analyzes and refines the rural scenes in Zhejiang.

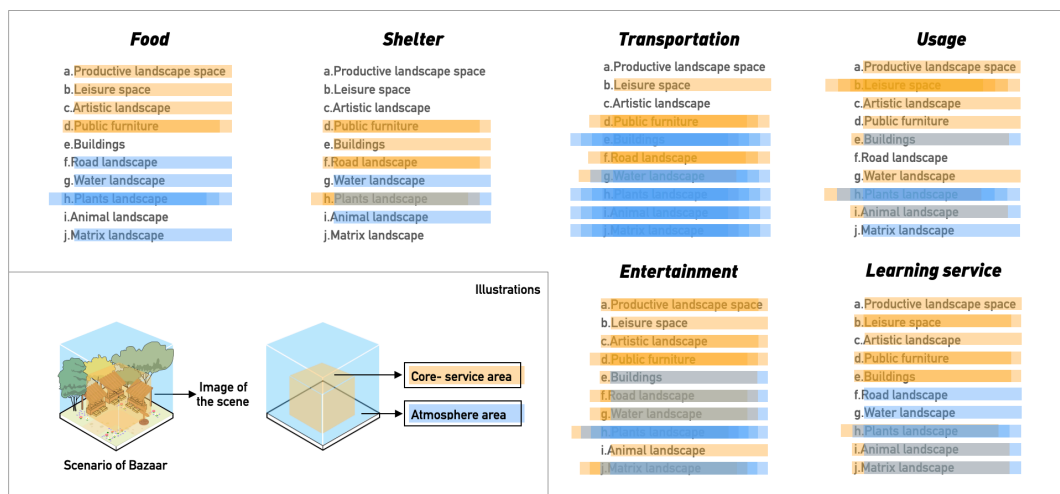


Figure 2-3 Result from mapping the landscape design and planning matrix

In drawing the analysis map, we distinguished the core service and atmosphere areas for investigation (Figure 2-3). Concerning the landscape composition, yellow blocks denote the core service areas, and blue blocks denote the atmosphere areas [24]. Then, we marked the colors on landscape types in different services. Overall, the landscape types in core service areas are more inclined towards artificial landscapes, and those in the atmosphere area are more inclined towards natural landscapes. Most landscape types can be used in core service areas for entertainment services, so the landscape types are more affluent and broader in scope [25].

Thereafter, we conducted interviews and questionnaires to know tourists' travel intentions. The question was as follows: 'In which of the following scenarios would you prefer to do something related to [specific service]?' For shelter, most people preferred self-driving to see the scenery, as it is the most convenient option due to the inaccessibility of the countryside. Moreover, it allows them to visit more villages and see more scenery in the same area. More people preferred to choose the house for shelter, and the B&B industry constituted a large proportion of rural tourism. B&B houses are designed with unique features, and it is more convenient to integrate food, accommodation, and entertainment [26]. Accordingly, users' choices indicated that local cultural features such as bazaar and landscape features such as countryside view, picnic with more open scenes such as rafting, picking, and so on are more popular among tourists. However, studies should focus on exploring whether the classification of main design and environmental elements is scientific, whether other influencing factors exist, and whether a correlation exists with user experience.

5.3. Analyzing the differences of landscape components in services

We obtained the data through surveys, questionnaires, and interviews and mapped the results of the collected data on a framework diagram. The graph shows that users have different degrees of demand for each landscape in various services. We map the landscape composition of the seven main service types into the A-J landscape types:

1. The entertainment service is random and subjective and is affected by the motivation of tourists and the service provided. The service used is more of the services provided, and the same place can provide various services. The diversity of service functions formed by the same landscape is obvious, and designers must pay attention to combining the same landscape type into different service scenarios.

2. The number of landscape type which included in the food service is second, and the public space has the highest demand, with a demand score of 6.12. The residential service is biased towards the human landscape, and the demand for architectural landscape is the highest, with a demand score of 5.54. The service of the transport is towards to the human and natural landscapes, mainly road landscapes, with a demand score of 5.41. The commerce services focus on the human landscape, such as the market space, and the demand score of the productive landscape space is 6.145. When tourists buy products with local characteristics, they hope to see the source of production, or carry out picking, hand-crafting, etc. which are specially experience activities.

4. The creative landscape is necessary. For example, the shelter service's demand for leisure space is above 5.5 points. The shelter is obtained from buildings and outdoor leisure spaces, like treehouses, bubble houses, and other spaces built with new forms and materials. The maximum good of the overall landscape demands leisure space, especially in usage, entertainment, and learning services. The use of recreational space is relatively flexible and versatile.

These seven service types are defined according to the services mainly provided daily, but there is overlap. For an example of shelter services combined with transportation services and entertainment services, many traditional villages in Zhejiang, China, are built around the water, and tourists need to take a hand-rowing boat to the entrance. In recent years, the rise of homestays has brought new opportunities to these villages. Some villagers have converted their houses into homestays to receive tourists. Tourists must also row in and out by hand. The owner of the homestay provides boating services. Not only for convenience, but many tourists also find the format exciting and novel, and the boatman can tell local stories on board. In such a scenario, the integration and collocation of entertainment, transportation, and shelter services have created new services. Due to the combination of the different services the user experience has been improved. Therefore, the combination of service types can bring new services.

5.4. Analyzing the differences landscapes in the needs of different roles

An analysis is a set of roles to assign and separate the data obtained from our sample (figure 2-4). After collecting data from developers, villagers, tourists with children, and single tourists, their interest in landscape usage was different in some cases and similar in others. The various user demands for landscape compounds of food and shelter are not significantly different. The various user demands for landscape components of most transportation and usage are significantly different. The various user demands for landscape components of entertainment are different. The demand for landscape components of commerce and learning are significantly different. For example, the role identity for tourism shows a significant level of 0.01 ($F = 4.061$, $P = 0.007$), as well as the specific comparison differences; the results show that the average scores of the groups with significant differences were "single tourists > developers", single tourists > villagers; single tourists > tourists with children".

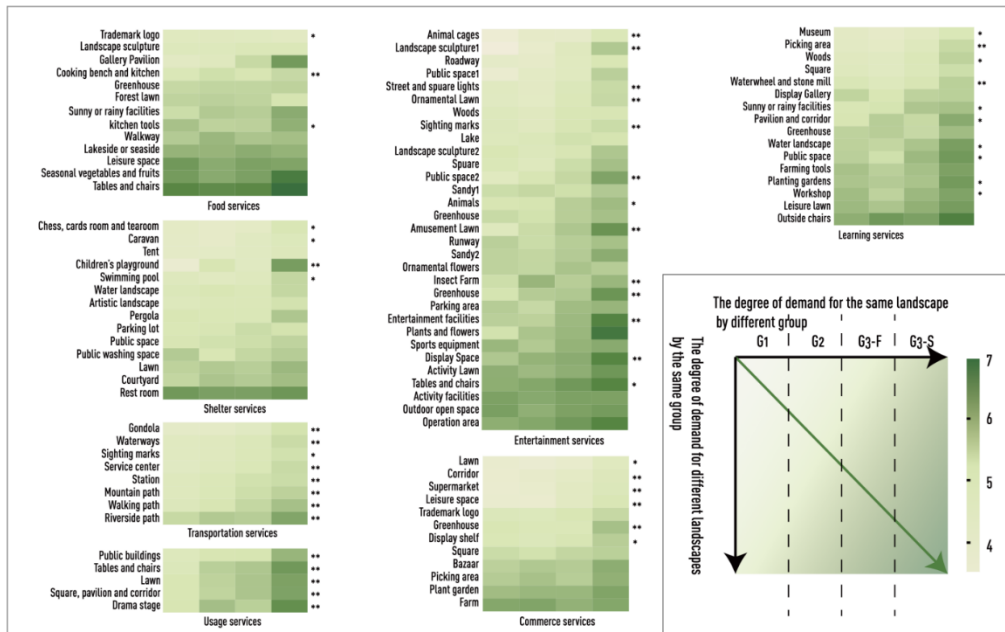


Figure 2-4 Differences result in heat map.

1. According to the analysis of the differences in the needs of different service groups, the degree of difference in the needs of landscape composition from high to low in order is transportation, usage, learning, commerce, entertainment, shelter, and food. The analysis shows that the higher the significance of differences, the higher the personalization of service requirements. The lower the significance of differences, the higher the necessity of service demand. For example, different transportation modes affect the demand for different landscapes. Among the usage services, the specific service is related to the choice of landscape, so the individualization is more prominent, which will be further analyzed later. Food and accommodation services are necessary for daily travel, so the degree of difference is relatively low. Food and housing services are essential services, so the demand for landscape composition is high, and the areas with lower demand have more landscapes with more significant differences.

2. The landscape and the crowd are all different in the travel and usage services, so individual needs are emphasized in these two types of services. In the heat map, the color of the service used is darker than that of the travel service, so the overall demand for the travel service is not high, and the population's needs are different. The demand for the services used is relatively high, and the population's needs vary greatly.

Figure 2-5 shows the usage service where the roles for the theme events is significant at the 0.01 level ($F = 5.573, p = 0.001$), and the difference in this comparison shows that the comparison result of the average score of the group with significant differences is “tourists with children > developers; single tourists > developers; single tourists > villagers”. The roles are significant for business communication at the 0.05 level ($F = 3.700, p = 0.012$), and their difference shows that the comparison result of the average scores of the groups with significant differences is “developers > villagers; tourists with children > villagers; single tourists > tourists with children”. The roles are significant at the 0.01 level for the hand-made experiences ($F = 8.146, p = 0.000$), and their difference shows that the comparison result of the average scores of the groups with noticeable differences is “single tourists > developers; single tourists > developers; single tourists > villagers; single tourists > tourists with children”. The roles for stage performances are significant at the 0.01 level ($F = 6.535, p = 0.000$), and their difference shows that the comparison result of the average scores of the groups with noticeable differences is “villagers > developers; tourists with children > developers; single tourists > developers; single tourists > villagers; single tourists > tourists with

children”. The roles are significant for movie screenings at the 0.01 level ($F = 9.633, p = 0.000$), and their differences show that the comparison result of the average scores of the groups with noticeable differences are “single tourists > developers; single tourists > developers; tourists with children > villagers; single tourists > villagers; single tourists > tourists with children”. The summary shows that several identity samples show significant differences in themed activities, business exchanges, interactive experiences, hand-made experiences, receptions, stage performances, banquets, and movie screenings.

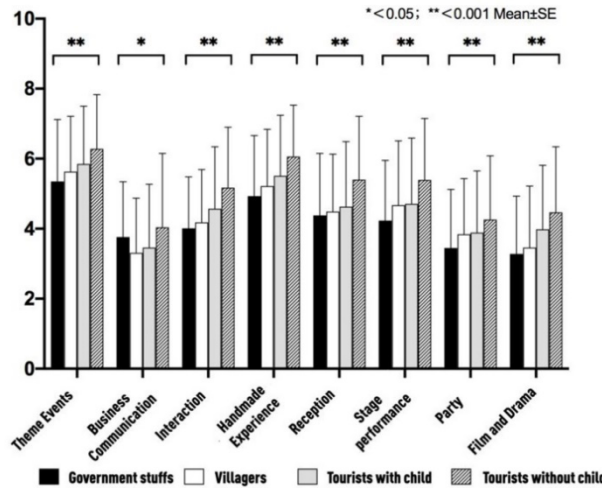


Figure 2-5 The difference comparison result of usage service

The overall score of tourists without children is relatively high. The purpose of traveling is relatively simple, and the scores of villagers and tourists with children are relatively close. They compare it with their cognitive service experiences because most villagers understand them and tourists with children. Tourists focus on children’s facilities and varied life experiences.

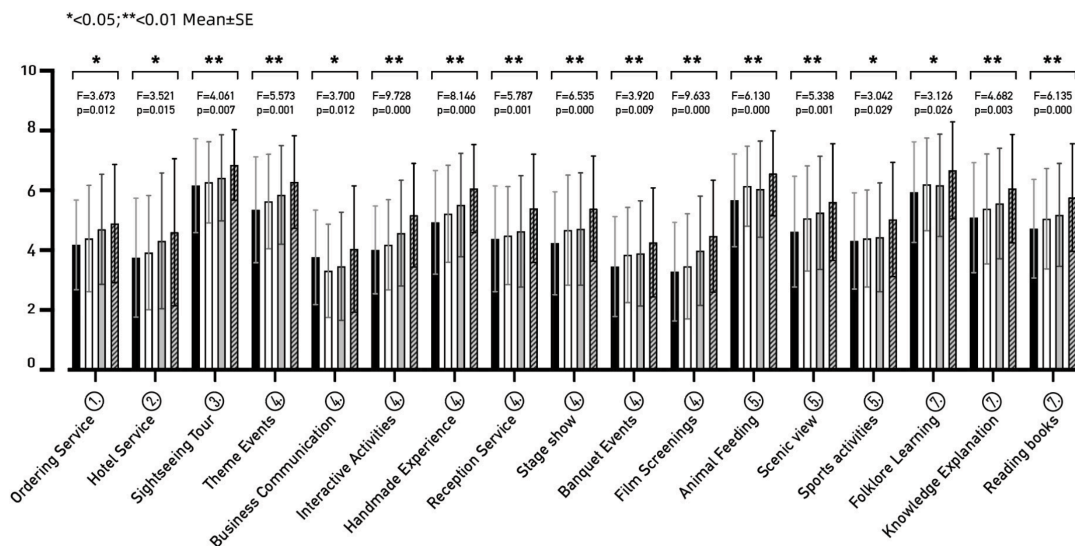


Figure 2-6 The difference comparison result of different scenario

In the questionnaire survey and interview (Figure 2-6), we found that, first, different identities showed significant differences in thematic activities, business exchanges, interactive experiences, hand-made experiences, receptions, stage performances, banquets, and movie screenings. Secondly, for the specific services of usage and entertainment, the degree of overlap of service content is significant. The usage focuses on the specific use, such as the space function and what to play in this place. The content depends on the user's choice. For these two services, the degree of

participation of all parties in the design process is relatively high. At the same time, public space and cultural landscape account for the majority of these two types of services. Playing focuses more on leisure and entertainment and the landscape that this place can provide tourists.

During the research process, the same landscape composition can constitute different service scenarios, but the demand is different (Figure 2-7). For example, the lawn (natural landscape) and the corridor (human landscape) the lawn landscape appears in the entertainment, usage and commerce services. It shows that different groups of people have significant differences in the demand for the same landscape under different services. Multi-functional use in a specific area is common.



Figure 2-7 The difference result of the same landscape components in different service

6. Discussions and Conclusion

In conclude, people have a higher preference for special landscapes and a lower preference for universal landscapes. Common factors include two aspects, one is foreign landscapes, and the other is conventional landscapes, as shown in Figure 2-8. Tourists are disgusted with the common landscape in the city appearing in the countryside. This kind of landscape is lower than the expectations of tourists, and the demand is reduced. Such as cable cars, signs, and other tourist attractions often appear in other places. The special factors contain two aspects, one is the regional landscape, and the other is the necessary landscape. When tourists travel in the countryside, they are curious about the regional landscape. The regional landscape often carries the story of the local village, which is also very attractive for tourists. Necessary landscapes, such as some public facilities, toilets, etc.

At present, most of the designers and tourists targeting the villages of western Zhejiang in China are from city. For designers, excavating local characteristics and combining creativity can bring novelty to tourists in the city. They can carry out creative designs in terms of form, culture, and beauty, and at the same time, pay attention to users' participation in the design to ensure the protection of villagers and tourists better experience. Unfortunately, the current homogenization of rural landscape design is apparent. For example, pavilions of the same shape can be seen in all villages. However, pavilions are different from urban infrastructure, and pavilions can be used as leisure spaces and artistic landscapes. For designers, the local culture and stories should be fully explored, and the interests of all parties should be satisfied as much as possible through design creativity.

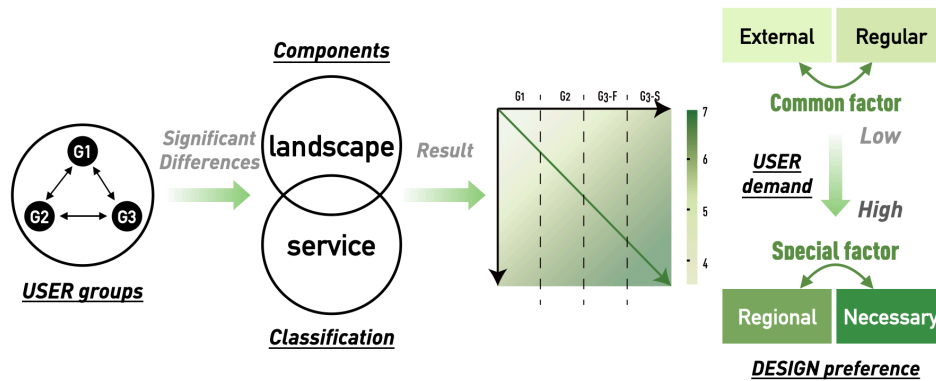


Figure 2-8 The characteristics of Landscape preference of different group

Different roles of the landscape from our three parties (government, villagers, and tourists) are interrelated, different, or similar in some cases. It can be challenging to find a balance point of the different roles in our design process in rural areas. We designed unconventional plans to recommend measures like permission for every landscape space for the usage of different types of leisure and division of a building to include one sector each for art, commerce, shelter, food, and learning. A common balance point is possible, according to our assessment, with the division of land use. We have to combine rural tourism landscape design and planning to realize the potential of design and creativity.

The most important added value of using design approaches in landscape planning is the increased focus on aesthetics and communication. It also includes the different methodologies for creating alternative futures and developing objectives and concrete measures [27]. Landscape planning could benefit from design approaches by involving and exciting citizens and stakeholders in the process.

Landscape design is an independent profession and art tradition where designers combine the regional people's nature and culture. It should correlate with the culture and nature of the villagers. Landscape planning develops landscapes among competing land uses while protecting the natural processes, resources, and culture. Planners organize the location of different sites while protecting nature, culture, and natural processes while designers design the structures. Thus, it is evident that landscape designers and planners provide different services. Our analysis implied that different people have different needs for leisure. For example, the different user demand for landscape components for parts of entertainment is different. It means that planners and designers are responsible for the different users while planning and designing joints for entertainment. A design plan can solve the problem of different landscape design services and planning that concerns different needs of different people.

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Chapter 3

Exploring the Design Strategy from the Relation between Servicescape and Tourist Experiences in Rural Tourism

1. Introduction

The key to stimulating the endogenous dynamics of rural communities and tapping into the endogenous characteristics of rural spaces is to be community-based and evidence-driven, as the rustic design is a combination of science and art (Dewey-Solbeck). Design significantly promotes the mobility and development of social institutions, emphasizing the change of social substrates and coordinator role of designers. Furthermore, design can play a huge role in rural tourism. However, determining ways to effectively provide services to users by designing better service scenarios as well as enhancing the user's tour experience needs exploration.

The purpose of this paper is mainly the following three. First of all, it can be learned from the previous literature review that the current research objects for servicescape are limited to shopping malls, restaurants, playgrounds, homestays, etc., while the innovative exploration of rural tourism servicescape and their dimensions is still in the initial stage. This study selects the villages in western Zhejiang (Lin'an and Quzhou areas) as the research object, mainly in mountainous regions, explores and enrich the content of servicescape. The dimensions of rural tourism service scenarios correspond to the dimensions of customer experience one by one, and the size of the impact is sorted. This provides opinions and ideas for rural designers, planners, managers, tourism operators, and investors and is essential to rural tourism-related research.

Secondly, previous research on service scenarios has focused on the study of atmosphere elements, layout design, social elements, etc., ignoring the impact of design on the tourist experience and the customer's emphasis on safety and publicity. This study incorporates the subject design and landscape-related elements and security into the dimension of service scenarios, especially in the villages in mountainous Zhejiang, where security is critical. And hope to enrich the empirical research results in the field of rural tourism servicescape.

More, the research method has been innovated. Through the combination of qualitative and quantitative research, the use of landscape analysis diagrams combined with actual tourism experience to research the relevant dimensions of tourist experience and service scenes, which can intuitively show the content of tourism servicescape.

2. Method

2.1. Method design

We selected seven main service types: food, shelter, transportation, entertainment, usage, commerce, and learning. We sorted out many cases, interviewed users, and analyzed the differences between varied groups of people for rural tourism services. The results of the questionnaires and interviews conducted with 561 people and the difference analysis of the data revealed that the difference between the population in terms of usage and learning services is largely due to different needs, resulting in more content on the difference between these two types of services. Thus, we chose food, shelter, transportation, entertainment, and commerce as shown in the Figure 3-1. We conducted literature monograph research, servicescape induction combing, and mapping analysis for the western region of Zhejiang, China (including some projects we have worked upon). A

preliminary experience test was conducted with 20 middle-aged tourists. The tourists were gradually introduced to the test scenario through pictures of tourist sites and interviewed appropriately. Then, according to the participants' responses, a list of words and phrases describing the scene and experience was obtained. These included 'Aesthetically pleasing landscape', 'Useful space', 'People friendly', 'Clear guidance', 'novel landscape', 'safe space'; other servicescape description words such as 'comfortable', 'relaxing', 'exciting', 'interesting', 'rewarding'; and other words describing the sense of experience. This process was followed by item sorting and scale creation through descriptive statements. The questionnaire contained (1) basic questions, (2) servicescape selection, (3) servicescape evaluation, and (4) tour experience evaluation. The questions included multiple choices and scale questions. The items were scored on a 5-point Richter scale, with 1 - strongly disagree, 2 - disagree, 3 - not sure, 4 - agree, 5 - strongly agree. Furthermore, descriptive words were randomly arranged on the scale. Among them, for the survey of service scenarios, to allow users to identify the regions of subject design and environmental elements, we adopted the display mode of analysis diagram and combined pictures and text to conduct research (Figure 3-1). A total of 272 completed the questionnaires online and offline, and 263 valid responses were received. The results were then analyzed using Cronbach's coefficient to verify the reliability of each variable, followed by Kaiser–Meyer–Olkin (KMO) sample measures and Bartlett's spheres to assess the suitability of the samples for factor analysis. Factor and correlation analyses were mainly conducted for the servicescape and travel experiences. The questionnaire is in Appendix 2.





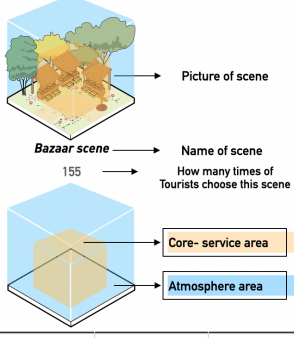



















Services Type	Tourism Servicescape							
Food services	 Picnic scene 157	 Pavilion scene 108	 Public space 87	 Picking scene 50	 <p>Picture of scene</p> <p>Bazaar scene 155</p> <p>Name of scene</p> <p>How many times of Tourists choose this scene</p> <p>Core-service area</p> <p>Atmosphere area</p>			
	Shelter services	 Buildings scene 168	 Caravan scene 107	 Camping space 88				
Transportation services		 Self-driving scene 198	 Riding Scene 97	 Hiking Scene 73	 Boating scene 56	 Bus scene 40		
	Entertainment services	 Countryside viewing 145	 Drifting scene 119	 Climbing scene 112	 Drying scene 109	 Picking scene 93	 Field viewing scene 82	 Fishing scene 71
Commerce services		 Bazaar scene 155	 Picking scene 125	 Sales space 70	 Pavilion-street scene 60			

Figure 3-1 Picture of landscape composition and services analysis

2.2. Variable Definition

Baker [1] divided service scenarios into the following three categories: atmosphere elements, design elements, and social elements. Atmospheric elements include air quality, sound, smell, and cleanliness, and design elements can be aesthetic or functional actions, such as layout, logo, color, decoration, tone, etc., not only limited to functionality but also to provide users with service perception. Social elements include people and human scenes, including social, cultural, folklore, etc., and can bring new definitions to services. Rosenbaum and Massiah [2] further expanded the service scenario and proposed the physical dimension, social dimension, social symbolic dimension, and natural dimension of the service scenario. Therefore, in selecting variables, according to the results of the previous user interviews, we divided the service scenarios into the following three elements (Table 3-3). The core design elements are Servicescape A(1-6): SA1, SA2, SA3, SA4, SA5,

and SA6, and the environmental elements are Servicescape B (1-6) :SB1, SB2, SB3, SB4, and SB5. The social elements are Servicescape C (1-6) SC1, SC2, SC3, SC4, SC5 and SC6.

In the dimension setting of user experience, Schmitt [3] and Johnstone [4] divided the experience into five dimensions: sensory experience, emotional experience, thinking experience, action experience, and association experience. Kim J et al. [5] divided the tourism experience into Hedonism, Involvement, Local culture, Refreshment, Meaningfulness, Knowledge, and Novelty. According to the previous tourist survey of rural tourism, the experience is divided into the following four elements: the experience of relaxation and enjoyment, the experience of excitement and expectation, the experience of emotional life, and the experience of thinking and harvesting. Among them, the experience of relaxation and enjoyment is the variables Experience A(1-6):EA1, EA2, EA3, EA4, EA5, EA6, the experience of excitement and expectation is the variables Experience B(1-5):EB1, EB2, EB3, EB4, EB5, the experience of emotional life is the variables Experience C(1-6):EC1, EC2, EC3, EC4, EC5, EC6, the experience of thinking and harvesting are variables Experience D(1-4):ED1, ED2, ED3, ED4. The questionnaire is in the Appendix 2.

3. Results and Analysis

3.1. Reliability analysis

We used the SPSS 25.0 software to verify the reliability and validity of the 263 qualified questionnaires. Cronbach's α coefficient of the scoring questionnaire was 0.932, indicating good reliability of the questionnaire. It is confirmed that a Cronbach's α greater than 0.801 indicated excellent internal consistency [6]. Therefore, the overall validity of the questionnaire had a very high internal consistency.

3.2. Sociodemographic characteristics and servicescape preference

The sociodemographic characteristics and tourism status of the respondents are shown in Table 3-1. Overall, respondents were under 60 and mainly held a college or undergraduate degree. The frequency of travel is high, with more than 80% of the population having two or more trips, indicating that the respondents have traveled to western Zhejiang many times and are familiar with travel in Zhejiang west. Nearly half of people choose two days with one night, and three days with two nights, choose a short-time trip.

Table 3-1 Sociodemographic characteristics and tourism situation of the respondents

Sociodemographic characteristics		Number	%
Genders	Male	117	44.5
	Female	146	55.5
Ages	under 30	86	32.7
	31-45	96	36.5
	46-60	51	19.4
	61-75	26	9.9
	Above 75	4	1.5
Education	High school and below	51	19.4
	Specialist	93	35.4
	Undergraduate	104	39.5
	Master degree and above	15	5.7
Who to travel with	travel alone	34	12.9
	family and relatives	138	52.5
	friends and colleagues	91	34.6

How many times came to western Zhejiang for tourism	1time	50	19
	2times	74	28.1
	3times	77	29.3
	Above 4times	62	23.6
How many days does general rural tour last?	one day	36	13.7
	two days and one night	59	22.4
	three days and two nights	56	21.3
	Four days and three nights	40	15.2
	Five days and four nights	32	12.2
	more than six days	40	15.2

The We distinguished the core service and atmosphere areas for investigation in drawing the analysis map (Figure 3-1). With regard to the landscape composition, yellow blocks denote the core service areas, and blue blocks denote the atmosphere areas [7]. Thereafter, we conducted interviews and questionnaires to know tourists' travel intentions. The question was as follows: 'In which of the following scenarios would you prefer to do something related to [specific service]?' For shelter, most people preferred self-driving to see the scenery, as it is the most convenient option due to the inaccessibility of the countryside. Moreover, it allows them to visit more villages and see more scenery in the same area. More people preferred to choose the house for shelter, and the B&B industry constituted a large proportion of rural tourism. B&B houses are designed with unique features, and it is more convenient to integrate food, accommodation, and entertainment [8]. Accordingly, users' choices indicated that local cultural features such as bazaar and landscape features such as countryside view, picnic with more open scenes such as rafting, picking, and so on are more popular among tourists. However, studies should focus on exploring whether the classification of main design and environmental elements is scientific, whether other influencing factors exist, and whether a correlation exists with user experience.

3.3. Factor analysis of servicescape and travel experience

3.3.1. Factor analysis of servicescape

KMO sampling appropriateness metric and Bartlett's sphericity test. The KMO measure of sampling appropriateness measures the degree of correlation of a set of variables with a value between 0 and 1. When the overall sum of squares of bias coefficients is small relative to the sum of squares of correlation coefficients, the KMO value is close to 1 and the batch is suitable for factor analysis; otherwise, it is not suitable for factor analysis.

Kaiser (1974) characterized this measure as follows: above 0.9: excellent; between 0.8 and 0.9: commendable; between 0.7 and 0.8: good; between 0.6 and 0.7: moderate; between 0.5 and 0.6: acceptable; and below 0.5: unacceptable.

Table 3-2 KMO and Bartlett's test

KMO The number of sample suitability measures		.924
Bartlett sphericity test	Approximate cardinality	3125.457
	Degree of freedom	136
	Significance	.000

As indicated in Table 3-2, the observed value of Bartlett's sphericity test statistic is 3125.457 and the corresponding probability P-value is close to 0.000. at the significance level of 0.05. Since the probability P-value is less than the significance level, the original hypothesis should be rejected; thus, the correlation coefficient matrix is considered to significantly differ from the unit array. The selected indicators are suitable for factor analysis. Meanwhile, the KMO value was 0.924, and according to the KMO metric given by Kaiser, the selected indexes are suitable for factor analysis.

The data of the common degree of all variables is shown in the Table 3-3 (the common degree

indicates the amount of variable information extracted by factor analysis, and the index value ranges from 0 to 1. The larger the value, the more removed, and the less than 40%, the serious missing), the first column is the common degree under the initial solution of factor analysis, and the second and fifth column are the common degree extracted according to the principal component analysis. It can be seen that the common degree indicates that the part does not meet the relevant standards.

Table 3-3 Common factor variance

NO.	Variable definition	Initial	Extract	NO.	Variable definition	Initial	Extract
SA1	Efficient use and basic functionality intact	1.000	.705	EA1	Delightful	1.000	.783
SA2	Well laid out and functionally planned	1.000	.701	EA2	Enjoyable	1.000	.800
SA3	Clear instructions to get to the location	1.000	.669	EA3	Freedom and liberty	1.000	.765
SA4	Aesthetic appearance	1.000	.775	EA4	Feeling relaxed	1.000	.794
SA5	Artistic form	1.000	.716	EA5	Relieving stress	1.000	.751
SA6	with a regional cultural identity	1.000	.697	EA6	Feeling at ease	1.000	.760
SB1	Landscape is aesthetic	1.000	.799	EB1	Exciting	1.000	.869
SB2	Landscape form is rich	1.000	.719	EB2	Broaden horizons	1.000	.850
SB3	Landscape distribution landscape is at scale	1.000	.701	EB3	Curiosity and expectation	1.000	.859
SB4	Variety of landscape types	1.000	.707	EB4	Feeling fresh	1.000	.854
SB5	Landscape is novel and distinctive	1.000	.710	EB5	Sense of history	1.000	.845
SC1	The environment is clean and tidy	1.000	.818	EC1	Enhancing the emotions with others	1.000	.737
SC2	Well maintained	1.000	.690	EC2	New friends made	1.000	.707
SC3	Relatively public and freedom	1.000	.713	EC3	Bringing strangers closer	1.000	.735
SC4	Safe and protected	1.000	.701	EC4	Feeling kindness and warmth of people	1.000	.715
SC5	The locals are friendly and welcoming	1.000	.723	EC5	Feeling good about life	1.000	.745
SC6	Reasonably priced attractions	1.000	.715	EC6	Greater sense of hope for the future	1.000	.756
				ED1	Open up of one's own mind	1.000	.892
				ED2	New friends made	1.000	.888
				ED3	Motivated to learn and work	1.000	.893
				ED4	Learn about the new regional culture	1.000	.871

Principal Component Analysis, PCA

Then we use the Principal Component Analysis (PCA) to extract and synthesize factors based on sample data. Three factors were extracted in this factor analysis; the eigenvalues of the three factors were 7.714, 2.519, 2.025, and the variance explanation rates after rotation are 45.374%, 14.819%, and 11.91%, respectively, explaining 72.103% of the total variance of the original variables. In general, the information loss of the selected three indicators is less, and the effect of factor analysis is ideal, so consider extracting these three factors.

Table 3-4 Rotated component matrixa

	Servicescape	Ingredients		
		1 Subject design	2 Environment and atmosphere	3 Social and humanistic
1	SA4	.832	.208	.199
2	SA5	.830	.119	.115
3	SA2	.810	.125	.170
4	SA6	.793	.154	.211
5	SA3	.792	.094	.182
6	SA1	.783	.157	.259
7	SB1	.080	.867	.201

8	SB2	.172	.818	.145
9	SB4	.110	.814	.179
10	SB5	.202	.796	.190
11	SB3	.132	.794	.229
12	SC1	.200	.267	.841
13	SC6	.179	.169	.809
14	SC3	.160	.221	.799
15	SC2	.185	.141	.797
16	SC4	.169	.217	.791
17	SC5	.291	.191	.776

Extraction method: Principal component analysis.

Rotation method: Kaiser Normalised Equivalent Maximum method.

a. Rotation has converged after 6 iterations.

It can be seen from Table 3-4 that the classification through the factor rotation matrix is consistent with the original classification, so the validity of the questionnaire is considered to be good. The factors include the subject design factor, environment and atmosphere factor, and social and humanistic factor. Combined with the aforementioned chart, we can see that the subject design factor corresponds to five indicators: whether the appearance has beauty and art, whether the space function layout is reasonable, whether it has local characteristics, whether it has good use function, and whether it has appropriate location setting and guidance. Second, the environment and atmosphere factor corresponds to five indicators: whether the landscape is aesthetic, the landscape type has diversity, the landscape type has uniqueness, and the landscape layout is reasonable. Finally, the social and humanistic factor corresponds to five indicators: whether the environment is clean and hygienic, facilities are maintained and secured, the space is public, the price is reasonable, and the local people are friendly and warm [9, 10].

3.3.2. Factor analysis of travel experience

As indicated in Table 3-5, the observed value of Bartlett's sphericity test statistic is 5189.278 and the corresponding probability P-value is close to 0.000. at the significance level of 0.05. Since the probability P-value is less than the significance level, the original hypothesis should be rejected; thus, the correlation coefficient matrix is considered to significantly differ from the unit array. The selected indicators are suitable for factor analysis. Meanwhile, as indicated, the KMO value is 0.936. According to the KMO metric given by Kaiser, the selected indexes are suitable for factor analysis. Then the calculate of total variance show a total of four factors were extracted in this factor analysis, and the eigenvalues of the four factors were 9.428, 2.661, 2.482, 2.299, and the variance explanation rates after rotation are 44.893%, 12.672%, 11.819%, 10.947%, explaining 80.331% of the total variance of the original variables. In general, the information loss of the selected four indicators is less, and the effect of factor analysis is ideal, so consider extracting these four factors.

Table 3-5 KMO and Bartlett's test

KMO The number of sample suitability measures.		.936
Bartlett sphericity test	Approximate cardinality	5189.278
	Degree of freedom	210
	Significance	.000

Table 3-6 Rotated component matrix of travel experience

NO.	Visitor Experience	Ingredients			
		1 Pleasure	2 Anticipation	3 Emotion	4 Reflection
1	EA4	.843	.135	.172	.191
2	EA2	.830	.170	.219	.188
3	EA5	.830	.177	.147	.093

4	EA3	.829	.185	.161	.133
5	EA1	.814	.175	.253	.161
6	EA6	.814	.173	.207	.155
7	EB1	.151	.893	.178	.129
8	EB4	.182	.891	.131	.101
9	EB3	.151	.888	.168	.138
10	EB2	.178	.876	.200	.105
11	EB5	.169	.866	.180	.182
12	EC6	.182	.157	.823	.144
13	EC1	.127	.188	.809	.177
14	EC3	.204	.122	.808	.160
15	EC5	.214	.219	.802	.094
16	EC4	.209	.173	.783	.169
17	EC2	.190	.170	.779	.186
18	ED3	.121	.096	.148	.921
19	ED1	.130	.133	.104	.920
20	ED2	.163	.167	.148	.901
21	ED4	.162	.106	.203	.890

Extraction method: *Principal component analysis.*

Rotation method: *Kaiser Normalised Equivalent Maximum method.*

a. *Rotation has converged after 6 iterations.*

These include pleasure, anticipation, emotion, and reflection factors [11, 12], as indicated in Table 3-6. The enjoyment factor emphasizes the experience of relaxation, such as relaxed camping at a beautiful scenery. The anticipation factor emphasizes the experience of excitement and expectancy, such as the experience of the traditional papermaking process. The emotion factor emphasizes the experience of emotional life, such as having a social conversation with people around and getting closer. The reflection factor emphasizes the experience of reflection and gain, such as stimulating interest in local culture research.

3.4. Correlation analysis of servicescape and travel experience variables

The correlation coefficient between the ambient environment and subject design elements was .374**. This result indicates that ambient environment and subject design elements significantly positively correlated as indicated in Table 3-7. The correlation coefficient between social elements and subject design elements was .479**, indicating that social elements and subject design elements significantly positively correlated. The correlation coefficient between the social element and the ambient environment was .478**, indicating that the social element and the ambient environment significantly positively correlated. The three variables positively correlated with each other. The correlation between servicescape and tourists' experience was further analyzed by taking the subject design, environment and atmosphere, and social and humanistic factors as independent variables and the variables of tourists' experience as dependent variables.

Table 3-7 Correlation analysis

		1	2	3	4	5	6	7
Subject design	Pearson	1	.374**	.479**	.415**	.410**	.474**	.429**
	Sig. (two-tailed).		0	0	0	0	0	0
	Number of cases	264	264	264	264	264	264	264
Environment and atmosphere	Pearson	.374**	1	.478**	.472**	.378**	.436**	.357**
	Sig. (two-tailed).	0		0	0	0	0	0
	Number of cases	264	264	264	264	264	264	264
Social and humanistic	Pearson	.479**	.478**	1	.450**	.448**	.470**	.391**
	Sig. (two-tailed).	0	0		0	0	0	0

	Number of cases	264	264	264	264	264	264	264
Perception experience	Pearson	.415**	.472**	.450**	1	.425**	.490**	.381**
	Sig. (two-tailed).	0	0	0		0	0	0
	Number of cases	264	264	264	264	264	264	264
Reactive	Pearson	.410**	.378**	.448**	.425**	1	.438**	.329**
	Sig. (two-tailed).	0	0	0	0		0	0
	Number of cases	264	264	264	264	264	264	264
Emotional	Pearson	.474**	.436**	.470**	.490**	.438**	1	.395**
	Sig. (two-tailed).	0	0	0	0	0		0
	Number of cases	264	264	264	264	264	264	264
Reflective	Pearson	.429**	.357**	.391**	.381**	.329**	.395**	1
	Sig. (two-tailed).	0	0	0	0	0	0	
	Number of cases	264	264	264	264	264	264	264

***. The correlation is significant at the 0.01 level (two-tailed).*

3.5. Regression analysis of variables of tourism experience and servicescape

The correlation analysis above shows the correlation coefficient between rural service scenarios and tourist experience. This section uses stepwise regression analysis to further verify the degree of influence between these two variables.

3.5.1. The regression analysis of servicescape on the pleasure experience factor

The model summary in Model summary shown on the Table 3-8 indicates that the adjusted R-squared is 0.311. This result reveals that the regression equation can explain 31.1% of the total variance weight. The analysis of variance indicates that the regression relationship of the model is significant (Table 3-9). The regression analysis is shown on the Table 3-10 and B is a constant term, The non-standardized regression coefficient for the subject design element is 0.228, the non-standardized regression coefficient for the environmental atmosphere element is 0.331, and the non-standardized regression coefficient for the social element is 0.244. In addition, the probability of significance of the constant term T is $0.685 > 0.05$, indicating that the constant term does not appear in the regression equation. Each dimension of the servicescape significantly positively affects the experience of relaxation enjoyment, among which the environmental atmosphere element has the greatest effect. The specific regression equation is as follows: enjoyment experience = $0.228 * \text{subject design} + 0.331 * \text{environment and atmosphere} + 0.244 * \text{social and humanistic}$. Therefore, the overall environmental atmosphere greatly impacts the perceived experience factor. Creating the overall ecological atmosphere can bring people a feeling of relaxation and enjoyment. The quality of the first impression is often more affected by the prevailing environmental atmosphere. The designer's choice of the environment for the service scene needs to be matched with the concept conveyed to the tourists, and at the same time, pay attention to the design of landscape types, landscape forms and landscape distribution.

Table 3-8 Model summary

Model	R	R-square	Adjusted R-square	Error in Standard Estimation
1	.415 ^a	.172	.169	.96367
2	.538 ^b	.289	.284	.89476
3	.565 ^c	.319	.311	.87759

a. Predictors: (constant), Subject design

b. Predictors: (constant), Subject design, Environment and atmosphere

c. Predictors: (constant), Subject design, Environment and atmosphere, Social and humanistic

Table 3-9 ANOVA analysis

ANOVA ^a						
Model		Sum of squares	Degrees of freedom	Mean square	F	Significant
1	Regression	50.633	1	50.633	54.523	.000 ^b
	Residual	243.311	262	.929		
	Total	293.944	263			
2	Regression	84.989	2	42.495	53.079	.000 ^c
	Residual	208.955	261	.801		
	Total	293.944	263			
3	Regression	93.701	3	31.234	40.555	.000 ^d
	Residual	200.243	260	.770		
	Total	293.944	263			

a. Dependent variable: pleasure experience

b. Predictors: (constant), Subject design

c. Predictors: (constant), Subject design, Environment and atmosphere

d. Predictors: (constant), Subject design, Environment and atmosphere, Social and humanistic

Table 3-10 Regression analysis

Models		Unstandardised factor		Standardisation factor	t	Significance
		B	Standard error	Beta		
1	(Constants)	1.383	.238		5.810	.000
	Subject design element	.464	.063	.415	7.384	.000
2	(Constants)	.424	.265		1.600	.111
	Subject design element	.310	.063	.277	4.929	.000
	Environment and atmosphere element	.413	.063	.369	6.551	.000
3	(Constants)	.112	.276		.406	.685
	Subject design element	.228	.066	.204	3.431	.001
	Environment and atmosphere element	.331	.066	.295	4.975	.000
	Social and humanistic element	.244	.073	.211	3.363	.001

a. Dependent variable: Pleasure

3.5.2. The regression analysis of servicescape on the anticipation experience factor

Then we used the same method to analyse the specific regression equation of reactive experience factor. The model summary in Model summary indicates that the adjusted R-squared is 0.263. This result reveals that the regression equation can explain 26.3% of the total variance weight. The variance analysis indicates that the model's regression relationship is significant. The non-standardised regression coefficient for the subject design element is 0.255, the non-standardised regression coefficient for the environmental atmosphere element is 0.197, and the non-standardised regression coefficient for the social element is 0.310. In addition, the probability of significance of the constant term T is 0.184 > 0.05, indicating that the constant term does not appear in the regression equation. Each dimension of the servicescape significantly positively affects the experience of relaxation enjoyment, among which the environmental atmosphere element has the greatest effect. The specific regression equation is as follows: anticipation experience = 0.255*subject design + 0.197*environment and atmosphere + 0.310* social and humanistic.

Therefore, social and humanistic factors impact the response experience factor most. It is exciting to play in the countryside, broaden your horizons in rural tourism, feel curious and forward to the travel experience, feel fresh in the travel experience, and feel a sense of old architecture with a sense of history. Social and humanistic elements often focus on culture, system, order, and the communication and relationship between people. These elements can bring tourists more feelings and feedback about the village in the reaction experience. At the same time, the main design

elements also occupy a large part; designers can pay more attention to social culture, explore the historical aspects of the village, and build a communication environment and space between tourists and locals.

3.5.3. The regression analysis of servicescape on the emotional experience factor

Then we used the same method to analyse the specific regression equation of emotional experience factor. The model summary in Model summary indicates that the adjusted R-squared is 0.330. This result reveals that the regression equation can explain 33% of the total variance weight. The variance analysis indicates that the model's regression relationship is significant. The forementioned figure indicates that the non-standardised regression coefficient for the subject design element is 0.282, the non-standardised regression coefficient for the environmental atmosphere element is 0.222, and the non-standardised regression coefficient for the social element is 0.238. In addition, the probability of significance of the constant term T is $0.381 > 0.05$, indicating that the constant term does not appear in the regression equation. Each dimension of the servicescape significantly positively affects the experience of relaxation enjoyment, among which the environmental atmosphere element has the greatest effect. The specific regression equation is as follows: $\text{emotional experience} = 0.282 * \text{subject design} + 0.222 * \text{environment and atmosphere} + 0.238 * \text{social and humanistic}$.

Therefore, the subject design factor has the most significant impact on the emotional experience factor. The subject design can be used effectively, the basic functional facilities are intact, the scene space layout is reasonable, the functions are planned, and the guidance system has clear instructions), the main object has an aesthetic appearance. The subject design has a beautiful appearance. And the form has an artistic sense, and the design elements have regional cultural characteristics. A gorgeous design can make people feel happy and have aesthetic functions. These design elements can promote people's communication, create opportunities and topics for communication, and show the characteristics of the village to tourists in a more visual way. Local villagers increase their inner pride and desire to share.

3.5.4. The regression analysis of servicescape on the reflective experience factor

Then we used the same method to analyse the specific regression equation of reflective experience factor. The model summary in Model summary indicates that the adjusted R-squared is 0.241. This result reveals that the regression equation can explain 24.1% of the total variance weight. The variance analysis indicates that the model's regression relationship is significant. The forementioned figure indicates that the non-standardised regression coefficient for the subject design element is 0.331, the non-standardised regression coefficient for the environmental atmosphere element is 0.197, and the non-standardised regression coefficient for the social element is 0.215. In addition, the probability of significance of the constant term T is $0.198 > 0.05$, indicating that the constant term does not appear in the regression equation. Each dimension of the servicescape significantly positively affects the experience of relaxation enjoyment, among which the environmental atmosphere element has the greatest effect. The specific regression equation is as follows: $\text{reflective experience} = 0.331 * \text{subject design} + 0.197 * \text{environment and atmosphere} + 0.215 * \text{social and humanistic}$.

Therefore, the subject design significantly impact the user's reflection during and after the trip. The memory points of tourists in the travel process affect their future lives, such as opening up their thinking patterns, bringing inspiration and creativity to daily work and study, stimulating the motivation of life, and learning about the new regional culture. These memory points designers can create through the main body design, focusing on the main body's aesthetics, story, richness, and practicality.

4. Discussion

In this research, we focus on the relationship between servicescape and tourists experience, then analyze the factor to discuss the design strategy in tourism experience in rural areas. For the factor analysis of the servicescape, the factors can be roughly divided into main design, environment and atmosphere, and social and humanistic factors (Figure 3-2). As a result, we can learn that the breadth and depth of the design scope should be extended and deepened. For example, the subject design factors correspond to the design content of the form, guidance, and function design; the environmental atmosphere factors correspond to the planning, landscape, and architecture design; and the social factors correspond to the culture exploration, design co-creation [13, 14], and interaction design. The scope of design methods and applications is expanding; thus, at the same time, it is necessary to focus on the depth of design, that is, the dissemination of culture and tradition, communication between people, and other topics.

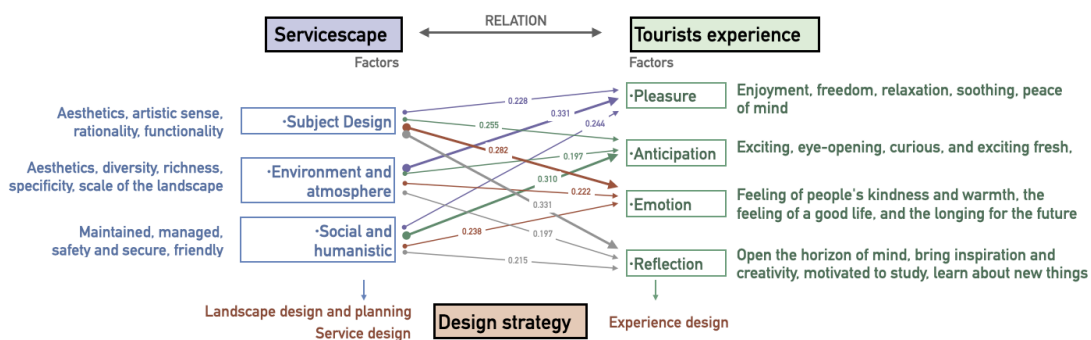


Figure 3-2 Design strategy framework in rural tourism

The tour experience factors such as perception, reactive, emotions, and reflection are the experiences from physiological to psychological [15] and are layered and deepened from outside to inside. Among these, the design factor significantly affects emotions and reflection. Tourists often compare the countryside with the city, and the reality with the expectation: ‘the countryside turns out to be so artistic’, ‘I want to live here in the future’, ‘the natural environment, fresh air is expected’. However, a sense of art aesthetic, function, location layout, and practical guide design is often unexpected. These are more likely to cause inner shock. For example, we held a persimmon tree blessing under the village entrance persimmon tree in Dongping Village and designed some blessing notes. Visitors can hang red notes on the persimmon tree on which people have written blessings. Such red notes with persimmons hanging all over the tree is very artistic, while the tree also becomes more sacred. The notes include ‘I will come next year to pray back’ ‘I will come next year to return the blessing and buy persimmons on the way back, the persimmons here are the best’. Accordingly, the design of the main activities related to the primary landscape can promote people’s communication and stimulate people’s emotions. In addition to the figurative products, we need to design abstract services to work together [16]. Different servicescapes conducts different experience, in perception experience environment and atmosphere need to be emphasize. In reactive experience, we need to realize the important of social and humanistic factor. In emotion experience and reflection experience, the subject design factors need more to be considered (Figure 3-2).

The continuing influence of design is excellent. Rural tourism in the hearts of tourists is expected to be different in terms of the planning of the countryside but still maintain the traditional style, highlighting the cultural characteristics of the region. The inclusiveness of the main design is increasing, not only in the appearance of the functional layout design but also in increasing the excavation of local culture. In the design of rural tourism landscape, designers should analyze the rural environment from multiple perspectives to understand the current living conditions, industrial buildings, folk customs, and living habits to promote the development of the local rural economy

and culture through design and artistic and creative interventions. This experiment mainly focuses on the Quzhou area in western Zhejiang Province as the investigation area, and the villages are generally mountainous, so the types of services will be limited to some extent.

5. Conclusion

This study aims to define the servicescape, and visitor experiences in rural tourism. Due to the large variability of different regions, this study is unique in that it focuses on the countryside in western Zhejiang, China. Different landscape types can constitute different service scenes. While the servicescapes in the countryside have a public character, different servicescapes can also provide the same services to tourists. The study has demonstrated the effect of servicescape on visitor experience. Thus, the specific differences and regional peculiarities require more research while highlighting the importance of design methods and strategies.

Research reveals that subject design, environment and atmosphere, and social and humanistic factors significantly correlate with each other in the servicescape. Furthermore, research indicates that user experience can be divided into four aspects: pleasure, anticipation, emotional, and reflective. These four are incremented by four levels: human and environment, human and content, emotion, and reflection from outside to inside. For tourists, it is easier to choose scenes with local landscape characteristics and cultural characteristics, and novel and open spaces are welcome. In the western region of Zhejiang, the safety and maintenance of facilities are more likely to be ignored. Therefore, in the stage of reaction experience, it is essential to give tourists a sense of peace of mind. At the same time, the villages give people freedom, and more open services can bring better experiences for tourists.

Furthermore, the research results indicate that each dimension of the servicescape significantly positively affects each degree of experience, and the degree of influence of each dimension is different for different experiences. For the main design elements, the form, function, and layout of space, landscape, and facilities can be the trigger point to generate daily, cultural, and regional communication. The cultural perception brought by art is shocking and often stimulates more emotions and reflections of visitors, and the experience of design for visitors is even more continuous. Rural development and urban development are two dimensions. Rural tourism can effectively promote endogenous development of rural areas. We hope that tourism can better spread the regional culture so that tourists have a good experience.

For further research, we will visualise visitor experience and servicescapes, expand the research area, further analyse the relation between landscape types and specific servicescapes, explore the mode of landscape and service design, and provide suggestions and design strategies for designers and planners.

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Chapter 4

Exploring Visualisation Methodology of Landscape Design On Rural Tourism In China

1. Introduction

The rural issues that China faces are the priority for the Chinese government. The development of local economy through tourism is one of the most promising approaches. Design and landscape planning methods provide an opportunity for the rural tourism industry to enhance tourist experience. According to People's Daily Online [1], from January to August 2020, the total number of local tourists travelling in rural places was 1.207 billion, which generated a total income of 592.5 billion Yuan, an operating rate of 94.5%, and 10.61 million jobs in the industry. Although rural design and rural tourism has become a sought-after topic, the development and utilisation of traditional villages present some limitations. The landscape design and planning efficiency has not been completely realised, causing some wastage of resources and ecological destruction. Homogenisation or standardised design has affected many traditional villages in China, leading them to lose their original culture and traditional characteristics, making them similar to a community within a city.

In the last six decades from 1960, considerable progress has been witnessed in landscape visualisation, with the work of photography [2, 3]. Several major technologies, such as eyes-tracking images, have been developed to determine user perception and experience. The literature has revealed that six mapping methods are predominantly available for visual landscape research [4]: compartment analysis, 3D landscapes, grid-cell analysis, visibility analysis, landscape metrics, and eye-tracking analysis. Entropy images are used to connect visualisation with landscape aesthetics, which emphasise the subjective impressions of visual complexity in landscape scenes [5]. However, no specific visualisation framework is available for designers or planners to evaluate and improve tourist experience through the design method. Therefore, designers and planners cannot directly use the visualisation method to improve user experience through design projects.

According to Andrew Lovett [6], the visualisation method should answer three main questions: 'when'? (to use the visualisation method), 'what'? (to include the information), and 'how'? (to display the information). A standardised expression is provided for the visualisation method for such a framework. The following points summarise the main contributions of this study:

1. A visualisation method is proposed to evaluate user experience during an entire trip.
2. A new visualisation framework is proposed to analyse the correlation among emotion (user experience), landscape aesthetics (type), and landscape services (active and passive enjoyment), and the results show the models of this relationship.
3. The use the visualisation method is discussed.

The purpose of this study was to study and discuss the possibility of using visual methods to help design and planning for rural tourism user experience. A relatively complete visualisation framework was proposed using related user experience design methods. This framework was applied in the rural design and planning to make it highly practical. Simultaneously, the framework was used to improve tourist experience under the premise of protecting the culture of traditional villages.

2. Case Study and Survey Method

2.1. Gaotiankeng Village

The Gaotiankeng Village (Figure 4-1) is located in Quzhou, western Zhejiang Province, at an altitude of approximately 700 meters and has a history of around 800 years. Here, average temperature in summer is approximately 5 °C lower than that in the surrounding areas, making it a natural summer tourist spot. Although the mountain peak is not high, Shan Lan is surrounded by beautiful scenery and blue sky. It is also the best point to observe starry sky in the Donghua area. The Gaotiankeng Village is a typical traditional village from the area south of the Yangtze River. The buildings in the village are mainly of rammed earth structures, with various shapes and spectacular views. The villagers still retain the simple lifestyle of digging ponds in front of their own houses to feed freshwater fish, a feature that has excellent development potential.

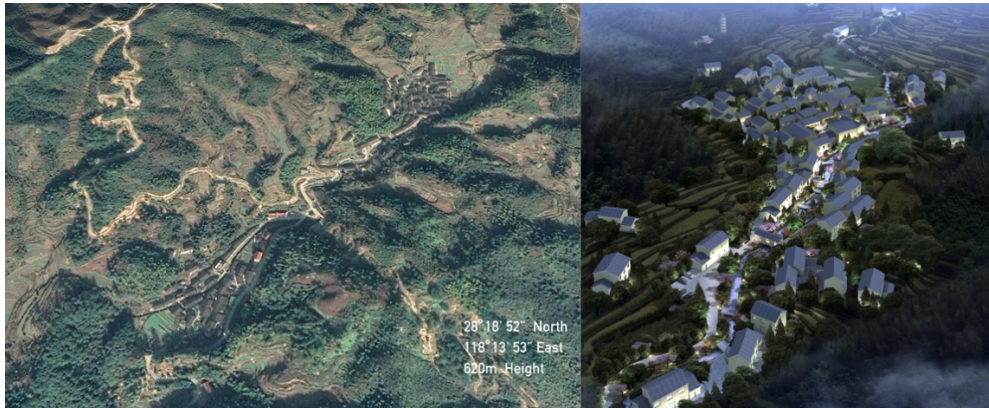


Figure 4-1 Location and the panoramic rendering of Gaotiankeng Village

Google map link: <https://www.google.com/maps/@29.3125082,118.2288567,966m/data=!3m1!1e3!5m1!1e4> (accessed on 12 December 2017)

Main design & construction



1. Entrance archway 2. Parking lot 3. Tourist reception center 4. Centennial yew 5. Covered bridge 6. Homestay 7. Homestay 8. Homestay 9. Art bar 10. Yew Culture Museum 11. Zhu Renmin Art Museum 12. Celebrity Art Museum Hall 13. Art Plaza 14. Kaihua Paper Traditional Craft Exhibition Hall 15. Homestay 16. Homestay 17. Yew Group 18. Qingshui Fish Culture Center 19. Restaurant 20. Photographer Club 21. Observation Deck 22. Leisure Garden 23. Qingshui Fish Pond 24. Restaurant 25. Luxury Hotel 26. Cafe 27. Waterfront Plaza 28. Millennium Yew 29. Tea House 30. Water Lane

Design outcome



Goal setting / outcome	Facilities & space design	Environmental & ecology creation	Community communication	Economic development
Building and landscape design	Maintain traditional building types and construction techniques and adopt traditional design elements in the village. For example, the entrance archway, parking lot, bridge, observation deck.	Use local materials and take them locally. Such as art installations, landscape design.	Preserve the architectural cultural heritage. The interior design of the space, the establishment of a new social square.	Strengthen existing resources, existing building forms and materials, such as restaurants, and cafes. The facade of the building maintains the traditional soil composition form.
Environment creation	Application of sustainable design methods. Such as country furniture design and installation art.	Combining local resources, environment, etc., to protect renewable resources. For example, the protection and development of natural resources of centennial yew, yew clusters, and old trees, and the improvement of ecological agriculture systems.	Sustainable productive handicraft activities organized or independently promoted by villagers, the ecological artificial production system.	Promote the development of tourism through landscape services. For example, the establishment of a photographer's club, a stargazing platform, etc. The beautiful and characteristic environment attracts a large number of tourists.
Community inclusion	The design of public space creates landscape elements. Cultivate civic identity, identity, and regional awareness. Such as the establishment of art squares, waterfront, pavilions and corridors.	Establish an open environment to improve resident relations. Reconstruct the multi-role relationship between tourists and villagers, villagers and villagers, villagers and villagers. For example, traditional arts, handicrafts, the reproduction and reconstruction of traditional life style, and the establishment of ancient fish ponds.	Improve the quality of life of disadvantaged groups, and enhance the satisfaction and quality of spiritual and cultural needs. Strengthen the participation of migrants and young people. Enhance the sense of collaboration.	Strengthen community awareness and improve the quality of life. Raise the sense of ownership.
Economic development	Diversified space design increases the adaptability and flexibility of space and land. Such as earth rammed house protection, interior space design, ancient fish pond planning and design.	Provide a variety of services and expand service types in coordination with the space. For example, the operation of stargazing services and photography.	Promote the development of the service industry and create employment opportunities through the development of tourism.	Economic sustainability, combined with social platforms, such as the internet, continues to develop.

Figure 4-2 Design and planning of project to renew the Gaotiankeng Village

The government and design team setting the design goals for Facilities and space design, environment and ecology creation, and economic development. According to these goals, we as the design team, we setting the 30 design outcomes. These outcomes can be respectively corresponded to four overall results, which are building and landscape design, environment creation, community inclusion and economic development.

2.2. Design goals and outcomes

Four design goals have been defined based on the planning and designing project: building and design, environment, community inclusion, economic growth. We made different design outputs across the project. As shown in the Figure 4-2, for the design and planning of the Gaotiankeng Village, we created 30 nodes in the main tour route. The output is the concrete expression of the four set goals, and the overall design and planning of the landscape's appearance, location, material, service content, etc. were performed. The Figure 4-2 clearly indicates that the design output of the four goals overlaps to a certain extent. For example, the improvement of community tolerance is closely linked to landscape design and environment creation. The rural does not need high-cost design; instead, it requires flexible design and a layout with extensible functions.

2.3. Survey method

To understand the user's landscape and service preferences, we used questionnaires, mental maps, and photo interviews. Furthermore, we took a tour and made a recording to have a comprehensive view of the user's perception and aesthetics. The tourist's perception of the landscape and their preference when traveling are highly complicated and can be disturbed by many external substances. Therefore, our approach involved a timely inquiry. Photos provide a visual stimulation that matches real life. The landscape experience is good because the photos holistically show the landscape [7]. Because of this, perception-based assessment is highly reliable and is suitable for capturing people's landscape preferences [8]. Measuring the biophysical characteristics of the landscape and its spatial layout allows us to quantitatively describe the visual characteristics of the landscape [9].

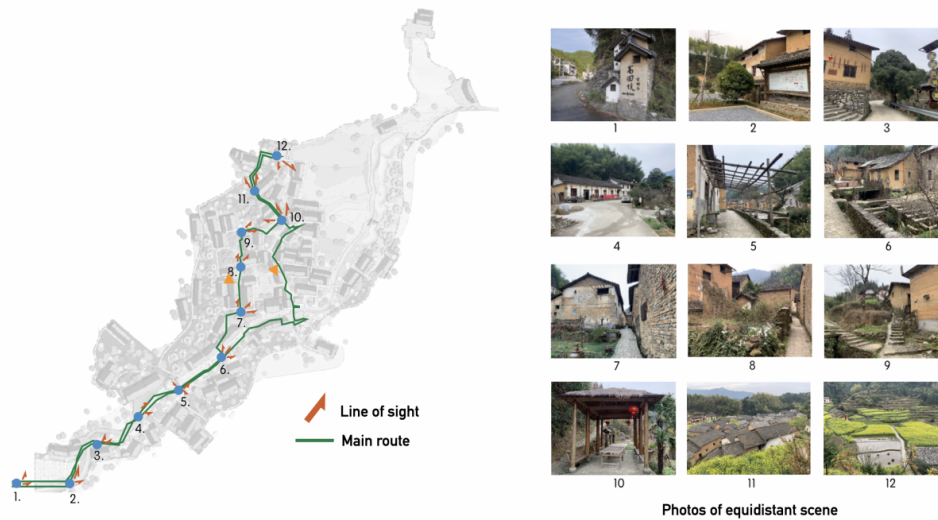


Figure 4-3 Main tour route, line of sight and photos of equidistant scene

Along with this, we also used an image questionnaire. A total of 20 tourists participated in our survey of questionnaires and interviews. The female participants outnumbered the male participants (56.8% vs. 43.2%). The questionnaires were based on Likert scale, 5-point with indicating 'not at all' and indicating 5 'very much'. Among the 32 tourists who followed the survey, 26 took the same route (as the main tour route) (Figure 4-3), and the 20 tourists who participated were from this group. The survey was an image questionnaire, with a total of 12 equidistant nodes for tourists to score and evaluate. Because many buildings served as the display or experience spaces of traditional culture, the types of services provided by the landscapes were different. We classified these according to the enjoyment of landscape service, but the service content level – such as service attitude and service quality – were not considered in this study. The interviews served to collect as much comprehensive information about user experience as possible.

3. Method

3.1. Design Process

1. We analysed 12 equidistant scenes along Path 1 (100 m) (photos by teams), shooting the subject and the direction of the line of sight in 2021, spring. Because humans mainly experience the environment visually, the understanding of environmental experience requires visual materials. Getting people to evaluate an actual landscape on the spot is expensive and time-consuming. It also limits the types of landscapes that can be studied by restricting the location; thus, using a specific location and case is a suitable choice. Concerns about the representation validity of photos in visual landscape assessment can be found in the literature. For example, Marjanne Sevenant compares three stimuli: in-situ landscape, panoramic, and standard normal photos. The site landscape in this study was evaluated during the field visit, indicating that standard formal photos were more suitable for measuring landscape preference variables [10]. Each point in a total of 12 equidistant points was measured on the mainline and photographed. The measurement started from the village entrance and ended with the viewing platform on the top of the mountain.

2. Computer image processing and the depth of field was utilised to distinguish between the foreground, middle ground and background [11]. The foreground and background elements in the visualisation play important roles in determining the tourists' visual preferences, but the middle ground is the key [11].

3. The picture was processed using image entropy processing. The formation of image entropy is as follows:

$$H = -\sum_i \sum_j P_{i,j} \lg P_{i,j} \quad (1)$$

Image entropy is an estimate of how "busy" an image is. Image entropy is expressed as the average number of bits per pixel of the set of image gray levels and also describes the average amount of information in the image source. For a two-dimensional image in discrete form, the information entropy is calculated as follows:

$$m_k = \frac{1}{N_k \times M_k} \sum_{j=1}^{N_k} \sum_{i=1}^{M_k} \log_2 |C_k(i,j)| \quad (2)$$

$$e_k = \sum_{j=1}^{N_k} \sum_{i=1}^{M_k} p[C_k(i,j)] \ln p[C_k(i,j)]$$

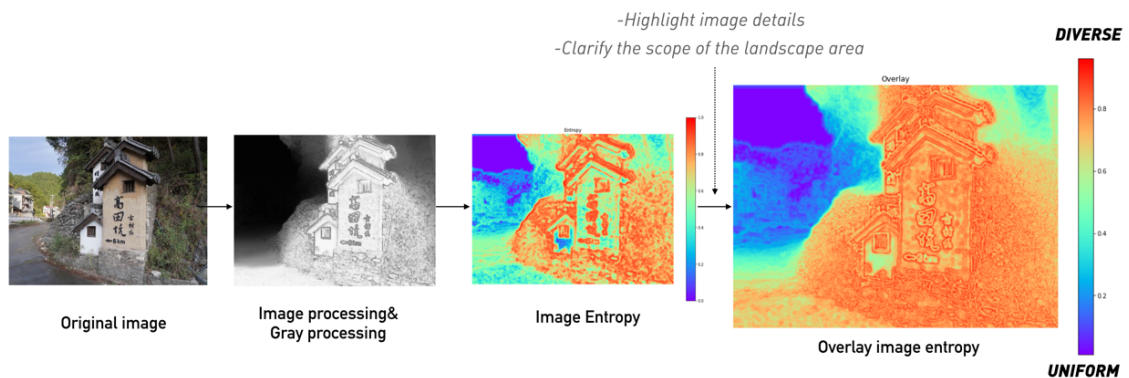


Figure 4-4 Flowtable of the entropy image framework

Based on the entropy image method, a tool is developed to calculate the entropy of image and to map the colour on the image (<https://colab.research.google.com/drive/1jHJvCCV885arTxdvz4rMZwfUOm19ocOz> accessed on 28 September 2022).

The processing has two steps (Figure 4-4): the first step is the grayscale calculation for the entropy of the photo, while the second step is to superimpose the original image and use the rainbow colour template to map the entropy image to obtain the final 10-pixel image. An entropy image is a collection of the entropy values of every image patch [12]. An entropy image is a collection of the entropy value of every image patch. (Signal Processing: Image Communication, 2018)

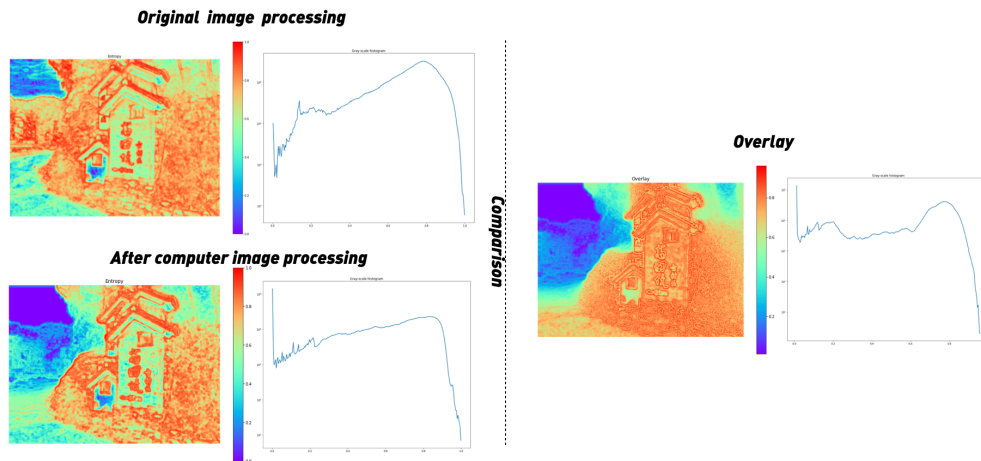


Figure 4-5 Flowtable of the entropy image framework

Entropy is a measure of image information content, which is interpreted as the average uncertainty of information sources. In Image, Entropy is defined as corresponding states of intensity level to which individual pixels can adapt. It is used in the quantitative analysis and evaluation image details, the entropy value is used as it provides a better comparison of the image details.

We conduct a program to get the final entropy image. First, we process the image with computer vision to simulate the visual focus of the tourists' vision. Second, we calculate the grayscale and make the image entropy process, the entropy progress of image is based on the scale of 10-pixel and the usage of a rainbow palette. Third, we apply the entropy-image with the image of the first step again and perform entropy calculations to conduct the final entropy-image Image entropy processing was used to process the image. The improvement of the visualizing technique: 1. It can more realistically and aesthetically convey the user's feelings about the landscape thanks to computer picture processing. 2. The user's visual feeling for the scene and the landscape category may be more clearly shown by superimposing the depth of field and features (as illustrated in Figure 4-5).

3.2. Visualization framework

1. Landscape aesthetics perspective: coherence, complexity [13]; Visual characteristics of the landscape: enclosure, legibility; Landscape space scale: hierarchy [14], these factors of Landscape aesthetics were analysed from the entropy images (Figure 4-6).

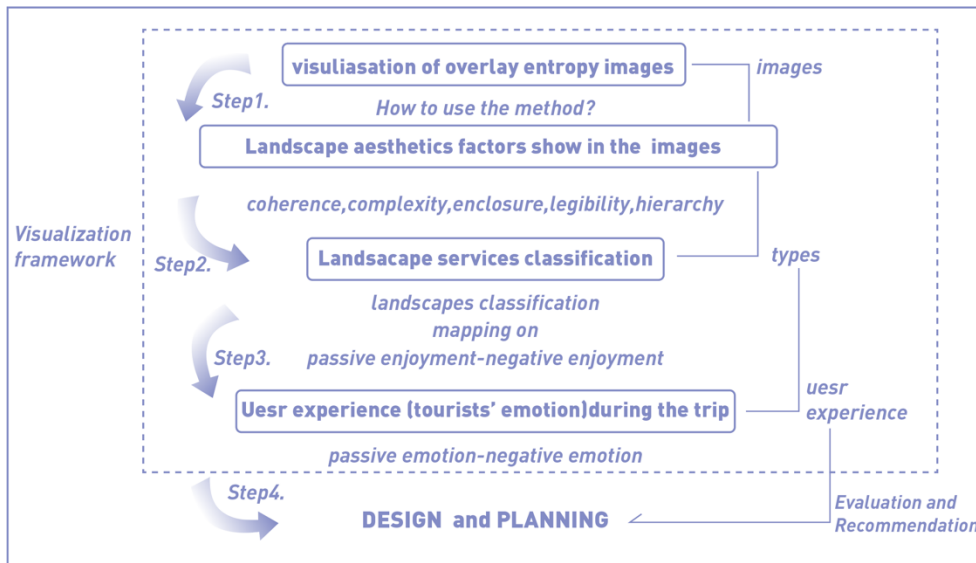


Figure 4-6 Flowtable of the visualization method framework

2. In Figure 4-6, we selected the fourth enjoyment [15] in the landscape service (LS) and divided into two categories of passive enjoyment (PE) and active enjoyment (AE). PE includes aesthetic appreciation, values, and heritage, while AE includes recreation, tourism, and ecotourism. The HLE categories are modified and adjusted according to the actual situation of the Gao Tiangkeng Village (Table 4-1): agriculture, forestry, mountain, traffic, mining, processing of food and materials, building type, religion, fishery, and hunting.

Table 4-1 Enjoyment of LS&HLE in Gaotiankeng village

LS	HLE	Agriculture	Forestry and mountain	Traffic	Mining	Processing of food and materials	Building type	Religion	Fishery and hunting
Enjoyment	Passive	O		O		O	O		O
	Active		O		O	O	O	O	O

“O” indicates that the landscape component belongs to the passive enjoyment and cative enjoyment.

3.The sentiment of rural tourism is an important indicator to evaluate user experience. Tourists with a higher degree of pleasure in general show higher satisfaction and better behavioural intentions [16, 17]. The role of emotion in leisure tourism research has been recognised in recent years. The travel experience usually includes feelings of satisfaction and pleasure [18-20]. Previous research has shown that emotions experienced affect tourist satisfaction [21, 22]. To evaluate the tourism of a destination, satisfaction is basically evaluated from four metrics: overall satisfaction, experience being in-line with expectations, wise decision-making, and experience being worthwhile. These reflect the comprehensive evaluation of the user’s play experience (Figure 4-7). Emotions can also influence the decision to purchase travel and leisure services [23]. This method has multiple advantages: it is fast, efficient, and easy to replicate in other areas. The framework developed can be used as an input to support landscape management, identify areas most required by society, and quantify the demand for space recreation to support political strategies [24]. In addition, novelty is a pronounced emotional dimension for tourists visiting traditional villages. Novelty refers to a psychological feeling of newness that results from a new experience. It is one type of potential construct of the memorable tourism experience [25, 26]. In this paper, the following four measures are selected as the evaluation dimensions and questionnaire design of the Gao Tiangkeng Village (Figure 4-7):

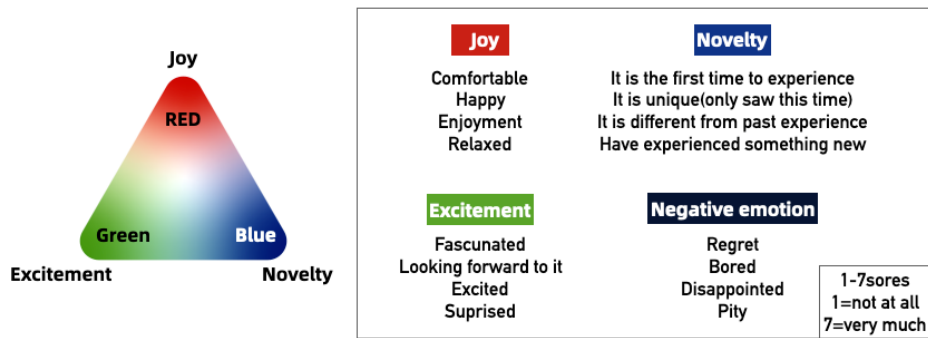


Figure 4-7 Evaluation dimensions of emotion in questionnaire

The image questionnaire survey method measured the negative and positive emotions of the tourists according to the travel psychology evaluation scale. The four dimensions are defined by the colour dimension RGB (Figure 4-7). The survey results confirmed the primary hue according to two parts with the highest scores. We defined the colours for the four emotions: joy, novelty, excitement, and negative emotion, according to which we could quickly identify the colours after superimposition. RGB can show the mix degree of red, green and blue, so we use the red to represent joy, green to represent novelty and excitement to represent excitement. In RGB, red is (255,0,0), green is (0,255,0), blue is (0,0,255). As we can see, the white is(255,255,255),if the score of the joy, novelty and excitement is higher, the mixed color is whiter. We convert the scores into a percentage, and then calculate how much of 255 it takes, then we can calculate separately the number of red, green and blue. Finally, we can get the final GBR number like the color (212,189,170).

4. As shown in Figure 4-8, we placed the ‘emotion,’ ‘landscape aesthetic factors’, and ‘landscape service’ parameters in a cube. The colour hue represents the emotion degree. The entropy image shows that the landscape aesthetic forms coherence, complexity, enclosure, legibility, and hierarchy. For the service part according to the entropy image result, the range is ‘0–1’. We split the whole value into three equal parts, and the parts with the highest and lowest values were excluded. The adjacent values of three equal points, 0.83, 0.49, 0.17, which can be clear distinction in the visual ground, were taken. The colour bar contains the information of landscape service classification and landscape components.

5. A multiple linear regression model was used to explain the linear relationship model of variables. The tool used was Spss 25.0.

6.This framework cube could give the designers and planners practical recommendations during the design project.

As seen in the graphic (Figure 5), We conducted a cube as the visulisation framewok which can show the different factors which inluence the tourist experience clearly [41].We will prove the efficiency in the desig project. The main part shows the entropy overlay image. For the analysis part, according to the entropy image result. We split the whole value into three equal parts. The three-part is present in different ranges. Then, we map active and passive enjoyment in the ranges.

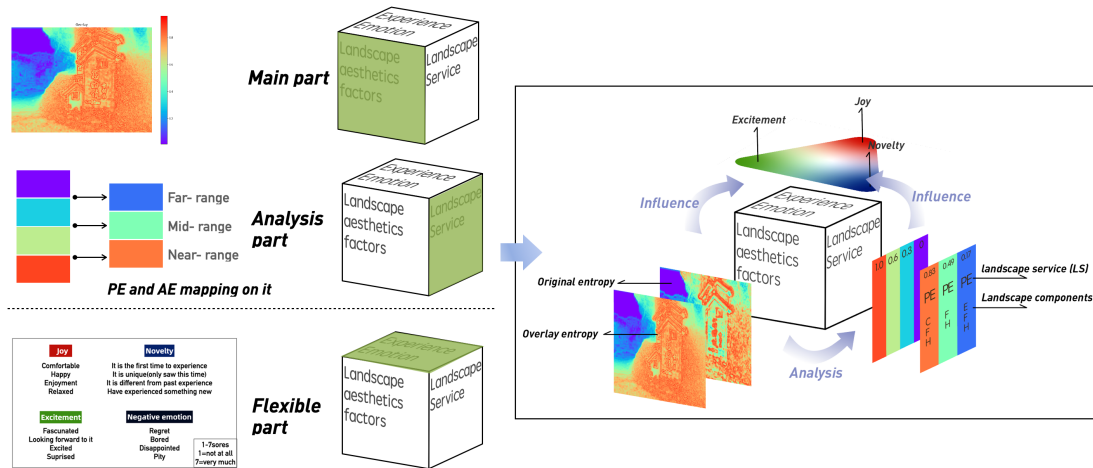


Figure 4-8 Visualisation framework cube

4. Result

4.1. Identity of Visualisation

4.1.1. Landscape aesthetics perspective: coherence, complexity

Ode et al. [13] used three dimensions to describe the visual landscape characteristics: (1) the distribution of landscape elements, describing the richness and diversity of elements in the landscape; (2) the spatial organisation of landscape elements, describing the arrangement of different components in space (3) the changes and shapes of elements and patterns, describing the degree of changes in the landscape and the shapes of elements and patterns. Research has shown that complexity and coherence are closely linked concepts for the landscape experience of tourists [27]. Metrics for the arrangement of units and the degree of repetition in the landscape are essential for describing the consistency associated with complexity [13]. Therefore, capturing the changes and shapes of the landscape space, organisational elements and patterns are essential. Figure 4-9 shows that the indicators of the arrangement of units in the landscape and the degree of repetition are high. This is especially true for the architectural landscape and the road landscape, which appear up to 9–10 times out of 12 times, giving continuity to the visitor experience.

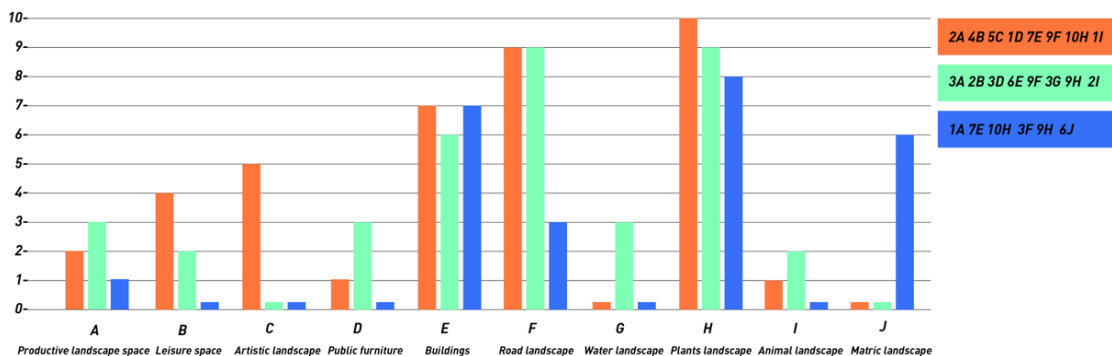


Figure 4-9 The type of landscapes are spread over three different areas

The degree of openness of the edge of each unit space and the relationship between visual and physical continuity was assessed. The visually walkable open area is relatively fuzzy in the village. First-time tourists can explore the place on their own, for example by following field trails. The

staggered location of the houses increases the rhythm of the experience and adds a sense of fluency to the continuous landscape. The open area of sight directly reflects the immediate senses.

The complexity indicators are as follows: 1. the distribution of the landscape attributes, richness, diversity; 2. the spatial organisation of the landscape attributes, edge density, heterogeneity, aggregation; 3. change and contrast are important, such as contrast, shape change, size change.

Complexity appears in the development of indicators for several landscape functions, including visual quality and biodiversity. Complexity has been used in environmental psychology as an explanatory factor for landscape preference. More information can be found in more complex landscape photographs [28].

Variables such as coherence, complexity, disturbance, visual scale, or naturalness overlap with aesthetic qualities. These can be used to identify the aesthetic preferences of users for outdoor environments. Additionally, aesthetic values are typically closely related to recreational ecosystem services because the aesthetic enjoyment of the landscape is a factor contributing to the choice of location for conducting recreational activities [29].

4.1.2. Visual characteristics of the landscape: enclosure, legibility

As shown in Figure 4-10, we classified the 12 pictures into types of enclosures. According to the classification and description of Robinson's permeability of enclosure [30], we classified the enclosures in the pictures as visually enclosed, physically enclosed/visually enclosed, physically open/visually open, physically enclosed/visually open, and physically open/Visually Open. We connected the type to each figure and marked it according to the composition form of each figure. The first ten pictures represent the nodes before the summit and depict the process of traversing the village, with type 1-3 interspersed with each other; 11-12 are type 4, located at the top of the mountain and looking down at the landscape, with a bird's eye view of the village.

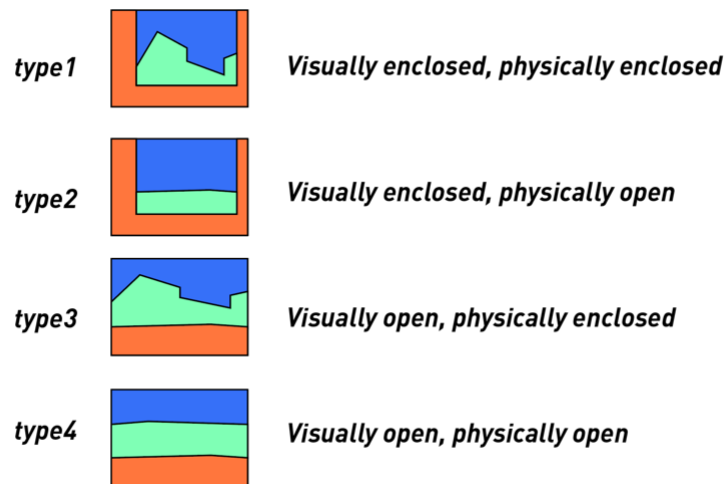


Figure 4-10 Enclosure type of the visual based on the entropy images

Traditional Chinese courtyards are typically fully enclosed by walls and/or architecture to make the associated properties private. Nowadays, buildings are less about housing and more about creating public spaces that provide services. The landscape is becoming increasingly important, rather than the architectural components, and is now often used to shape open spaces. The clarity of the village landscape contours, the coherence, and the integrity of the village spatial structure and form are the key points to improve the visual quality and enhance the attractiveness of the village. The computer image processing used in this study can reflect the user's visual impression of the landscape more realistically, intuitively, and clearly. The details of the final visual image can be clearly expressed through the overlay of the depth of field and details, and the clear expression of texture and contour is obvious.

4.1.3. Landscape space scale: hierarchy

The landscape elements themselves have an impact on the provision of benefits, their context, the relationships between them, and their spatial arrangement placed in the spatial scale section [14]. Tongji University suggests that ‘spatial confinement’ is the characteristic of the degree to which the viewer encloses elements of landscape space and that it is mainly influenced by the vertical factors of space within the viewer’s spatial context. Spatial confinement is characterised by both openness and closure. The spatial interface scale (spatial length) is as follows: <8 m; 8–25 m; 25–110 m; >110 m. The visual interface scale (sight distance) is as follows: <8 m; 8–25 m; 25–110 m; 110–390 m; >390 m. People typically have a psychological tendency to want to enter another type of space immediately after passing through one type of space [31]. Foreground and background elements in visualization play an important role in determining visual preferences, but the middle ground is the most important [9]. As shown in the figure 7, there are four levels from 0 to 1. We removed the highest and lowest values, where the lowest value represented the mid-play and sky views and the highest value represented the closest distance and complex changing views, such as rocks and leaves. As shown in the image, the middle region is divided into three parts: red, green, and blue. According to the HLE classification, we mapped the landscape types in three different regions.

4.2. Rhythm of changes in emotions

Most visitors chose to walk down the countryside trails and freely pass between buildings. Large and well-prepared paths are highly used for recreational activities, but they are visually less appreciated than nature trails [32]. Therefore, we selected and designed the main route with 12 nodes based on several studies.

As shown in the figure (Figure 4-11), when the color of each node is different, that is, the emotion of each node is different. On the whole, according to RGB, the lighter the color, the higher the positive emotion. During the entire experience, the color is close to the center area of the RGB color circle and lighter, indicating that the overall positive emotion is higher. The figure shows that the sixth node has the strongest sense of novelty and is more inclined to green. The eighth is the lowest positive mood in the whole travel mood, so the full color is darker. Numbers 9-12 are dominated by joy and excitement, and at the same time, the joy is high, and the color is red. We can analyse that novelty emotion is difficult to maintain throughout the tour, but the sense of pleasure can maintain a high score. Changes in landscape and services need to increase positive emotions if visitors remain pleasant throughout the process.

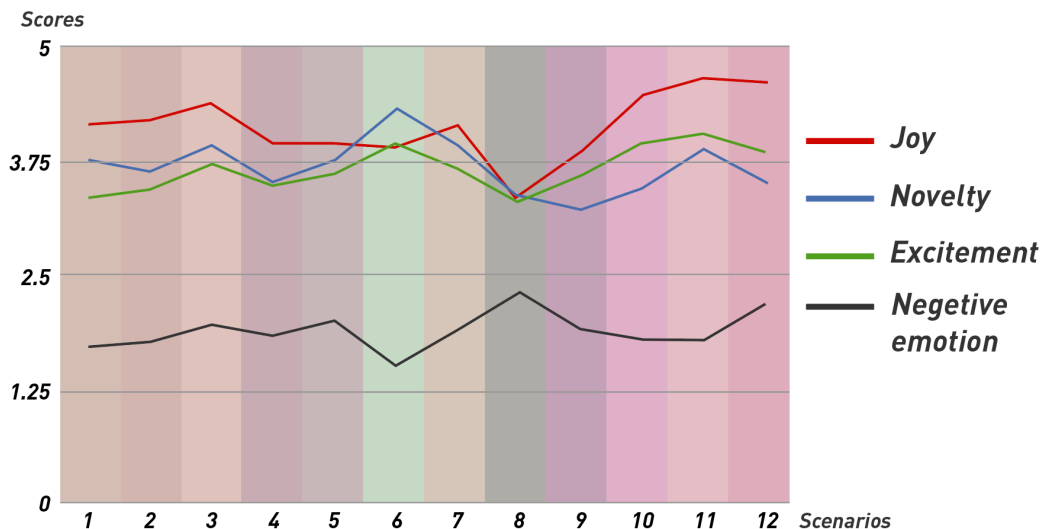


Figure 4-11 Result of emotion questionnaire and the colour definition of visualization

Designers and planners should consider the novelty of emotions of the tourists during the middle area when planning the entire process. For example, the novelty score increases at the sixth node thanks to the local cultural landscape: traditional fish farming. Fish farming in running water pit ponds has been done for 600 years in the Gao Tiankeng Village. Every family has a fishpond, and they raise fish mainly to meet their own daily consumption. If there are any extra fish, these are sold in the market. The traditional method of fish farming in ponds has two main features: water is drawn from the mountain spring and fish are fed on the grass in the mountains. The fishponds (Figure 4-12) in the village are built along the mountain, with water coming in from high places and water coming out from low places so that the grass carp are not muddy and, as a result, more delicious. This element of the human landscape is unique to the village; thus, it is new and exciting for foreign visitors. The uniqueness of the landscape highlights its difference from other regions, and the creation of differentiation is also an essential topic of discussion in village planning.

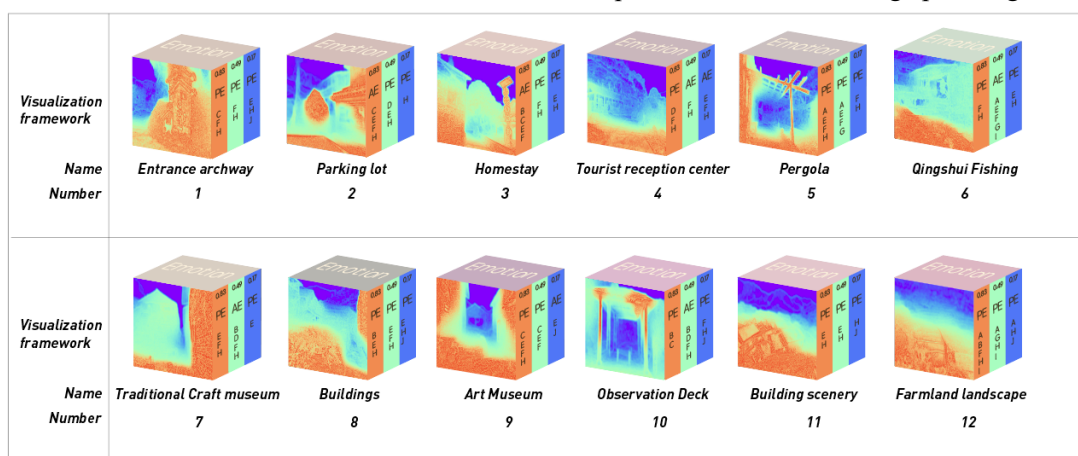


Figure 4-12 The visualisation of the framework during the whole trip

A bit of boredom and aesthetic fatigue is expected at the eighth node as well as a reduced mood because of the constant shuttling through the traditional village. Also, because the interview time was in early spring, everything was in the recovery stage, and a visually aesthetic landscape had not yet been formed. To maintain a high sense of experience however, we placed art installations on the roadside during the design. Since most of them were made with flowers and food items (such as corn, chilli, and other dried food) used as raw materials for the design, many were damaged due to the seasonal effects. Despite this, the visitors were surprised and delighted to find that they were still intact during the tour and stopped to take pictures of them.

Visitors already have complacency when they reached the last four nodes, and they were going up the mountain. When they were about to reach the top to enjoy the scenery, their mood was primarily pleasant and excited. The pleasure value reached its peak when they arrived at the viewing platform, i.e. the eleventh node. When colours are used to display the value of the emotion experienced, the visual effect created gives designers and planners a much stronger direct perception than simple data. In contrast, the change of colour rhythm can show the user's emotional experience during the whole tour so that the design and planning of the node can quickly give relevant suggestions.

4.3. Relevance analysis

Table 4-2 indicates that the correlation coefficient between the enclosure type and stratification type is 0.2, which in turn indicates that the two values have a positive correlation. The correlation coefficient value shows that the correlation between the two is not particularly strong. The

correlation coefficient between circumscribed type and emotion is 0.316, and the correlation between emotion and circumscribed type is stronger as compared to stratified type, also showing a positive correlation. The correlation between stratification type and emotion is the highest among the three correlations, with a value of 0.392, indicating that the two show a positive correlation.

Table 4-2 Relevance of enclosure type, service in ground type and emotion

	Enclosure type	Enjoyment type	Emotion
Enclosure type	1	0.200	0.316
Enjoyment type	0.200	1	0.392
Emotion	0.316	0.392	1

4.4. The influence of the service type in different areas on the emotion

The least-squares estimation method is used in this paper to estimate the model parameters. This method is the most commonly used classical estimation method, and its principle is to reduce the deviation between the observed values and the regression values as much as possible. Additionally, it provides an integrated consideration of all samples of the value of the deviation, and the requested will get the parameters of the least-squares estimation. The requested parameters can be obtained from the empirical regression equation (formula):

$$\hat{Y} = \hat{\beta}_0 + \sum_{i=1}^n \hat{\beta}_i X_i \quad (3)$$

We could not definitely conclude that the explanatory variable Y is linearly related to the independent variable Xi in the actual problem. Fitting the relationship between the explanatory variable Y and the independent variable Xi with a linear regression model before parameter estimation is an assumption made based on qualitative analysis. The following three tests are used in this paper: F-test for the significance of the regression equation, t-test for the significance of the regression coefficients and the test for the goodness of fit.

4.4.1. Effects on positive emotions

The model summary in Table 4-3 shows that the decidable coefficient R2 of the equation is 0.27 and the value of the amount of change in F is 0.984. Meanwhile, the Durbin-Watson (DW) value is considerably small at 1.683, which is relatively close to 2 and can be roughly considered as not having an autocorrelation. These values indicate that the model fits reasonably well. The impact regression coefficients are estimated below. Table 4-4 presents the results of the regression coefficient test for the equation. It shows that the p-values of the significance levels of the independent variables and constants in the equation are greater than 0.05. This in turn indicates that the regression coefficients of the model failed the significance test and that the linear relationship with the dependent variable negative emotion is not significant. This implies that the effect of stratification type on positive emotions (Y2) is not significant, the tolerance of all variables is less than 5, and the variance inflation factor VIF values are close to 1, indicating that there is no multicollinearity.

Table 4-3 Model summary

Model	R	R equation	Errors in standard estimation	F	Durbin-Watson
1	.519a	0.270	0.24206	0.984	1.683

Table 4-4 Parameter estimation

Model	Unstandardised coefficient		Standardisation coefficient	t	Significance	Covariance statistics	
	B	Standard error	Beta			tolerances	VIF

1	(Constants)	3.773	0.291		12.956	0.000		
	enjoyment in red area	-0.077	0.200	-0.124	-0.385	0.710	0.877	1.140
	enjoyment in green area	-0.154	0.157	-0.314	-0.982	0.355	0.891	1.123
	enjoyment in blue area	0.279	0.192	0.450	1.451	0.185	0.950	1.053

a. Dependent variable: positive emotion

The effect of stratified type variables on positive emotions is not significant, as shown from the results of the regression coefficient test (Table 4-5). The regression coefficients of the two variables are negative, except for the blue area, where all regression coefficients are positive. This shows that the blue area has a positive effect on positive emotions, while both the red area and the green area have a reverse effect relationship. The largest regression coefficient is 0.279 for the blue area, -0.154 for the green area, and -0.077 for the red area. The blue area has consequently the greatest effect on positive emotions, while the red area has the least effect on positive emotions. A simple multiple linear regression model can be constructed based on the regression coefficients, and the results of the obtained regression equation are shown below:

Positive emotion = 3.773 - 0.077 * enjoyment in red area - 0.154 * enjoyment in green area + 0.279 enjoyment in blue area

4.4.2. Effects on negative emotions

The model summary in Table 4-5 shows the goodness-of-fit test of the equation and provides the summary information related to the equation model. The table indicates that all variables enter into the regression equation as required in the regression model equation, and the decidable coefficient R² of the equation is 0.248 while the value of the amount of change in F is 0.491. Also, the Durbin-Watson (DW) value is considerably small at 1.911, which is highly close to 2, indicating that there is no autocorrelation. This indicates that the model fits reasonably well. The impact regression coefficients are estimated below.

Table 4-5 Model summary

Model	R	R equation	Errors in standard estimation	F	Durbin-Watson
1	.498a	0.248	0.2108428	0.491	1.911

Table 4-5 represents the multinomial results of the regression coefficient test of the equation. It shows that the significance levels of the independent variables in the equation have p-values greater than 0.05, indicating that the regression coefficients of the model failed the significance test. This also explains that the linear relationship with the dependent variable negative emotion is not significant, i.e., there is no significant effect of stratification type on negative emotion (Y1). The tolerance of all variables is less than 5 and the variance inflation factor VIF values are close to 1, indicating that there is no multicollinearity.

Table 4-6 Parameter estimation

Model		Unstandardised coefficient		Standardisation coefficient	t	Significance	Covariance statistics	
		B	Standard error	Beta				B
1	(Constants)	1.642	0.254		6.474	0.000		
	enjoyment in red area	0.117	0.174	0.219	0.670	0.522	0.877	1.140
	enjoyment in green area	0.220	0.137	0.522	1.606	0.147	0.891	1.123

	enjoyment in blue area	0.001	0.168	0.001	0.004	0.997	0.950	1.053
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a. Dependent variable: negative emotions

The results of the regression coefficient test indicate that the effect of stratified type variables on negative emotions is not significant, and all regression coefficients are positive. This suggests a positive effect on negative emotions. The regression coefficient is 0.117 for the red area, 0.220 for the green area, and 0.001 for the blue area (Table 4-6). The green area has a greater effect on negative emotions than the red area, and the red area has a greater effect than the blue area. A simple multiple linear regression model can be constructed based on the regression coefficients, and the results obtained are shown below:

$$\text{Negative emotion} = 1.642 + 0.117 * \text{enjoyment in red area} + 0.22 * \text{enjoyment in green area} + 0.001 \text{ enjoyment in blue area}$$

5. Discussion

When making mental maps with the tourists, our team found that they were highly cautious in selecting their destinations. They have a basic understanding of the local landscape features, culture, etc. Whether through articles, social media or advertisements, they get a general image of the characteristics of the village before visiting it. They also maintain a sense of anticipation and curiosity. The results show that the type of service in the blue area has a positive effect on positive emotions, while the type of service in both the green and red areas has a reverse effect on them. Since the trip scenario in the Gao Tiangkeng Village can be similar to the hiking scene, the tourists had expectations along these lines. Therefore, the planning and design of the type of blue area is often easy to ignore, whereas the environment and the landscape or services affect the emotions during the trip.

Emotional visualisation is a more intuitive and straightforward way of expression. Figure 4-13 shows that it has three main advantages: to improve efficiency, to improve satisfaction, and to reduce risks. Risk reduction here refers to reducing subjective errors and defining rural design and planning. These elements help bring better life experience scenes to villagers and tourists. The main functions of emotional visualisation for designers and planners are to record, reference and suggest. These functions lie in the four stages of the involvement of art design in the countryside: cognition, expression, perception, and development. Different application emphases for design and planning are applied in the various stages. In the first stage and fourth stage, design and planning need to be balanced; in the second stage, the focus needs to be on design, with an emphasis on the design of landscape, products and space; in the third stage, planning needs to be emphasised, with a focus on the creation of atmosphere, the improvement of users' visiting experience and the setting up of nodes. Planning and design have different priorities at different stages, and the use of emotion visualisation in different locations is also further necessary; hence, we should pay attention to the specific practice and application at the various stages.

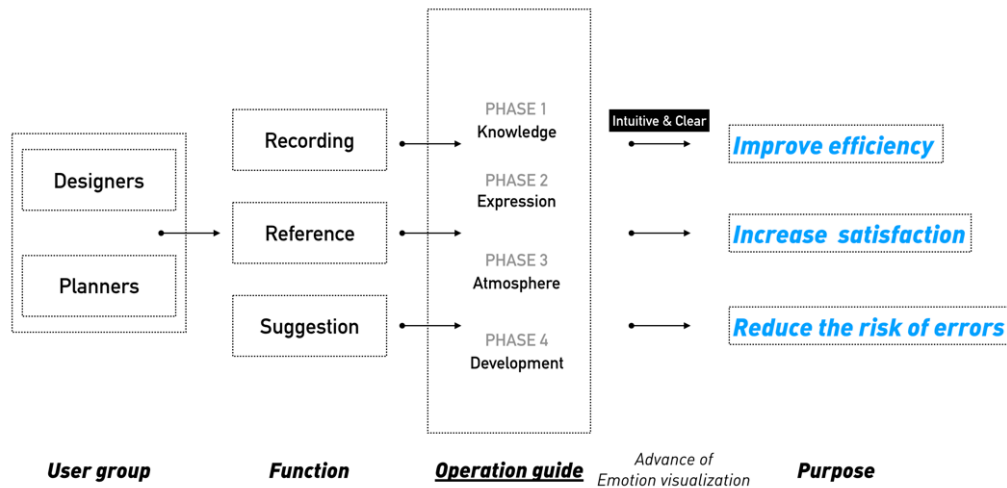


Figure 4-13 Visualisation methodology operation guide and purpose

The landscape visualisation approach should be customised to the stages of planning. The intended purpose, audience, and resources should influence the content and presentation. Stakeholder involvement in visualisation design can improve communication efficiency. Robust empirical research is needed to better compare visualisation options. Visualisation methods require a structured evaluation environment in a realistic visual presentation.

In more conceptual terms, visualisations represent a mechanism to support the ‘boundary management’ functions [33] as crucial for the creation of knowledge systems underpinning sustainable development. However, assessing aesthetic values remains challenging because they are only partially defined by the biophysical characteristics of the landscape that can be quantitatively described (e.g. vegetation type, spatial pattern) [34, 35]. Hence, the limitations of this visualization method are difficult to assess all the aesthetic values but can assess the main factors of aesthetics. The visualization framework needs to process one step by step, there were different results would appear if one of the steps’ results are different. Mostly, the mental factors and perception factors depend on the individual. Therefore, the topic needs further thought.

First, the quantification of landscape services assessment needs to be given importance. The assessment of landscape services essentially deals with the complex and dynamic relationship between humans and the environment. Quantification helps planners and designers solve real problems and promote the ecological development of rural tourism.

Second, the relationship between emotion and landscape needs to be explored. Beautiful environments are dependent on human perception and aesthetics, and the environment is the ambiance that people can perceive. Therefore, quantifying the atmosphere and presenting the data in a simple and clear form are essential for stakeholders to be able to create a beautiful environment together.

Third, the historical expression of the cultural landscape, such as the traditional camphor tree in the village, carries sentimental value for visitors. This emotion is deeper and richer than the general sense of ‘beauty’. Therefore, special attention should be paid to the emotional impact of such historical landscape services on people. Designers should ‘moderate design’ and avoid ‘excessive design’ to avoid destroying the carrier of people’s feelings.

6. Conclusions

This chapter presents a visualisation-based technique applied to enhance visitor experience. This evaluated technique can be used to for landscape planning and design. We developed a

visualisation framework and analysed the relationship among emotions (positive and negative emotions in user experience), landscape aesthetics (selected metrics: coherence, complexity, enclosure, legibility, hierarchy, which can be mapped on the entropy image), and landscape services (active and passive enjoyment) in detail. From the visualisation framework, we can conclude that the indicators related to landscape aesthetics and services generate different emotions throughout the tour. Users experience a feeling of novelty and thus positive emotions for rare landscapes, whereas when the landscape remains the same long periods of time, boredom and negative emotions are generated. The landscapes of Middle and background in the nodes' images must be focused while planning the type of landscape services, where a good atmosphere can generate positive emotions and a bad atmosphere can lead to negative emotions. Designers and planners tend to pay attention to the design of main objects in a specific project, and they always ignore the landscapes around the main object which influence the tourists' experience.

Although the traditional visualisation method only shows a single aspect of information based on local landscape and geographical elements, this visualisation framework connects landscape aesthetics, landscape services, and user experience, thereby causing emotional component visualisation and showing multiple aspects of information. Emotion visualisation is the assessment tool and presentation method that can be utilised in rural design planning. The positive and negative emotions generated by users during tourism can inform and advise designers at different design stages to enhance user experience. The visualisation framework presented in this paper has general relevance, is not limited to a specific location, and can be used in landscape design, landscape planning, route planning, and landscape services.

This study selected a traditional village in western Zhejiang, China, as the design and planning sample to preserve the cultural landscape of the village and to showcase the local culture and characteristics to a large extent to visitors. The visualisation approach can be effectively used to evaluate the design and planning project and obtain new strategies for the next design and planning around atmospheric landscapes.

In the future studies, researchers can continue to refine specific indicators, such as landscape aesthetics, landscape services, and user experience, and optimise them according to the specific experimental site. Simultaneously, techniques such as machine learning can be added to refine local design planning paradigms, and a database can be developed to obtain planning and design for other areas. The visualisation method can accurately grasp the relationship between user experience and landscape planning and design and provide better suggestions to designers and planners.

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Chapter 5

Design Approach For Inclusive Tourism In A Rural Village Based On Visualization Methods

1. Introduction

The term "social innovation" has been trending upward in recent years. The term "social innovation" has been trending upward in recent years. Social innovation refers to the practice process in which the government, enterprises, the third sector or individual citizens creatively integrate and utilize social resources individually or in cooperation to solve social problems and meet social needs through new approaches or methods. By combining urban and rural advantageous capital, urban and rural synergy networks can be built, and value can be co-created. It boosts service efficiency, encourages community participation in cultural production, and provides a solution to the issue of rural areas lacking the resources to sustain cultural services on their own. However, the environment and design receive little focus when taken as a whole [1]. Both sustainable tourism and social innovation have gained in popularity in recent years. Inclusive tourism has been discussed in traditional communities for centuries to foster mutual understanding and cooperation. However, these studies have only been conducted in a small subset of fields, and the relationships among tourism, social innovation, cultural heritage, and heritage are still very weak. In the meantime, the landscape is a major component of the design, and visitors' impressions are frequently pivotal to the success of all-inclusive vacations. Using Landscape Services (LS) [2, 3] framework, we approach this problem through design-based research. According to the categories of Historic Landscape Elements (HLE) [4], the value of which is determined by humans, the environment, and culture. They have a deep relationship, thereby determining the services that would be designed.

Although people have taken notice of ecologically sound landscapes, they may overlook them because of their mundane and foreign appearance [5]. For example, dilapidated traditional buildings do not have a good appearance but have great cultural value. Therefore she advocated for incorporating 'cue to care' that affects recognition of these landscapes to produce long-term ecological benefits. Understanding the decreased distance between ecology and people's perception is made possible by the concept of caring clues, which is widely used in landscape renovation. For these reasons, "human- Environmental Ecosystem" [6] research into design methodologies in environmental design was prioritized. Hence, we ask, "How can design help us renew and restore lost environments, cultures, and heritage and build new relationships with visitors to promote inclusive tourism for social integration?"

Due to the rapid development of urbanization, China is a victim of urban migration with these numerous and vast areas, and the historical rural settlements are turning into abandoned landscapes [7, 8]. We know China's rapid industrialization and urbanization have forced villagers to abandon the countryside. Instead, various reports and publications [9, 10] report a growing interest of tourists in historic villages. Thus, domestic tourism is expanding in several traditional villages, while others remain abandoned, despite their unique historical and cultural value. In conclude, China's rural regeneration is a dynamic, multi-scalar, and hybrid process [11].

2. Methods and Materials

This research project applied design research and qualitative analysis methods. The exposition of this paper is as follows: First, the research background of the design research method is defined.

Secondly, it introduces the categories and types of historical landscape elements in Landscape Services [LS], and conducts a case analysis of the traditional village in Yuan Touli village, and then sets the goals of the design project. Fourth, it outlines the design research through entropy visualization methods for the two villages we conducted the research analysis. Fifth, it analyzes the relationship and combinations of enjoyment in landscape service. It compares the difference between the traditional village through the sources in Kaihua and Gaotiankeng Village. Sixth, it shows the application of the visualization method to the tourism route planning in Yuanyuanli Village. Finally, it includes a critical discussion of the project outcomes.

2.1. Design goals setting

We combine the enjoyment group and HLE framework as shown in Figure 5-1. According to the village, we fill the framework and try to set the design goals base on the framework. As we can see, the Enjoyment is both passive and active. The landscape does not exist in a single location. Active and passive enjoyment are the two main types of enjoyment. This includes recreational activities, tourism, and ecotourism. Its range of services includes tourism-related activities. We used visual research methods to investigate the combination of passive enjoyment and active enjoyment. Figure 5-1 shows the details of the villages in Yuan Touli. We conclude the 3 points of design goals which related to rural village regeneration. The design goals setting is essential, they decide the design outcome and ensure the design could fit the village development.

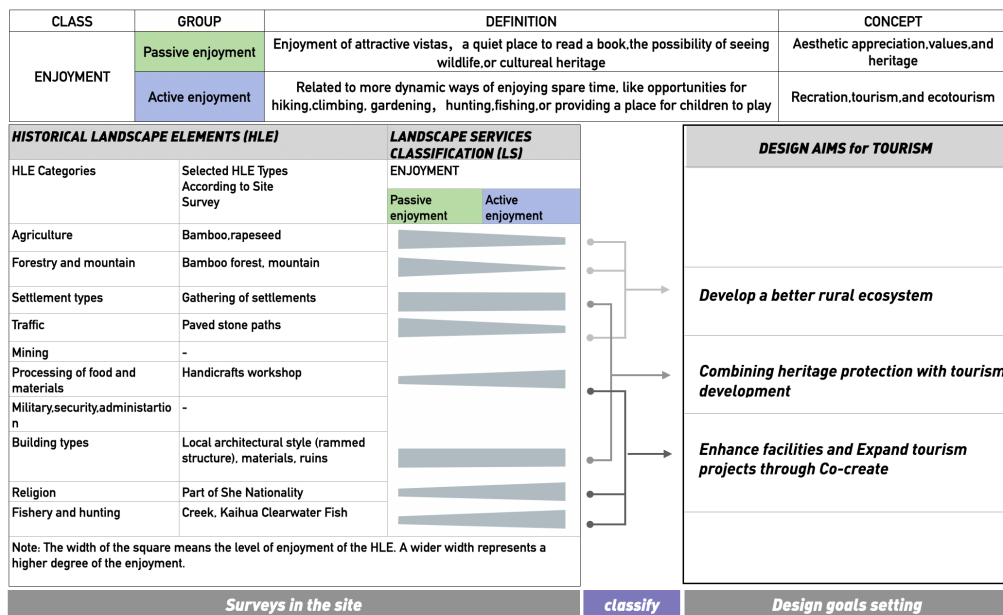


Figure 5-1 Classification of enjoyment and design aims to set based on the enjoyment of LS and HLE matrix

2.2. Study Area

We focused our case study on Yuan Touli village, an Traditional Village in Zhejiang, China. The Yuan Touli historical and cultural village is surrounded by high mountains and dense forests and has an overall elevation of about 750 meters. The climate here is moderate, with four distinct seasons and an average annual temperature of about 16 degrees. The well-preserved dwellings are simple and staggered, and the hills are terraced. The rainfall is abundant all year round, and the mountain streams are surrounded by water with numerous waterfalls, fresh air, and pleasant scenery.

2.3. Research Process

This study uses the visualization method, conducted by entropy imaging, to analyze the tourist's experience. We tried to combine the On-site interviews, observations, and questionnaire research to conduct it. We also proposed a model to apply the visualization method and route simulation. Analysis of the enjoyment relationships in landscape services through literature c. Entropy imaging can be used to process pictures of a crucial scenario. Visitors to the village of Yuan Touli were given questionnaires and interviewed about their impressions of the landscape depicted here.

2.4. Selection of Image Types

2.4.1. Selection of image types and combination

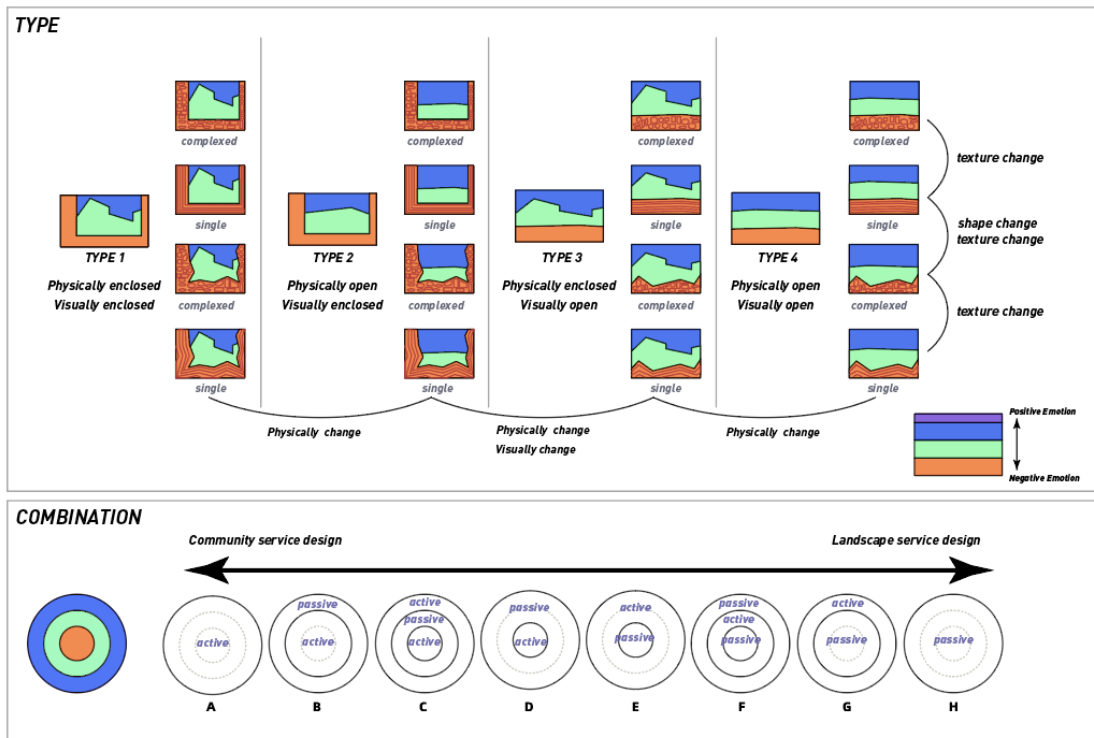


Figure 5-2 image types and combination

(1) Image types of perception

The entropy image visualization method clearly shows the richness of the landscape, the openness and the enclosure of vision as shown in figure 5-2, the landscape details and shape of color areas which can be easily recognized are observed. We further refined the enclosure type according to the image features of this entropy visualization method. The enclosure type was refined according to the image features of the entropy visualization method. The type was combined with the entropy image and subdivided into 16 types, as the Figure 5-2 shows. Landscape aesthetics were grouped into open and closed categories, including physical and visual, with four types. Since entropy reflects the information that is in the photos, so it reflects the changes in complexity. The changing texture represents the complexity and single texture. The four types were grouped into single and complex textures and shapes. The change from left to right represents the physical and visual types, and the change from top to bottom represents the texture and shape. In conclusion, the changing shape represents the complexity and irregularity of regional morphology, and changing texture represents the complexity and single of landscape, and changing texture represents the complexity and single of landscape. Therefore, the four types is divided into single and complex textures and shapes.

As shown in figure5-2, the change from left to right represent that the physical and visual, the change from top to down represent the texture and shape . The landscape complexity enhances the visual absorptive capacity from the perspective of visual perception. On the contrary, if the shape and texture are complex, it will also cause visual confusion. Such as untrimmed weeds, broken roads, etc.

(2) Combination of passive enjoyment and active enjoyment

According to the landscape service in the visualization cube, we refined and classified it, which helped improve our understanding of passive enjoyment (PE) and active enjoyment (AE) in Enjoyment. According to the color partition, we mapped the PE and AE of the specific village scene to its TYPE. We listed 8 different combinations through permutation and combination. As the figure 5-2 shows, we change the format from square to circle to show the red, green, and blue areas based on the entropy image. The dashed line represents the radiation range, and the solid line represents the stratification. As the figure shows, the left side is predisposed to community services design, providing rural community services, specific facilities, and services, like parking services, manual activity experience, homestay services, pavilions, tea rooms, etc. The right side is predisposed to landscape service design, focusing on landscape services, planning, and conservation design.

2.5. Questionnaire survey and interview

Questionnaires were distributed to residents of Yuan Touli village during the afternoon from January 10–16, 2022. Scenes from 12 major design nodes in the project were selected from its source. Four routes were used for further analysis (Figure 5-3), according to the distance. Details on the tourists' behavioral choices and psychological motivations were obtained through observations, interviews and questionnaires. The test was conducted using rendering photos. Editing and simulation of 12 groups of landscape pictures was performed using Adobe Photoshop CC 2020 and Adobe After Effects CC 2020. We also divided the questionnaire into the following parts(questionnaire in Appendix 4):

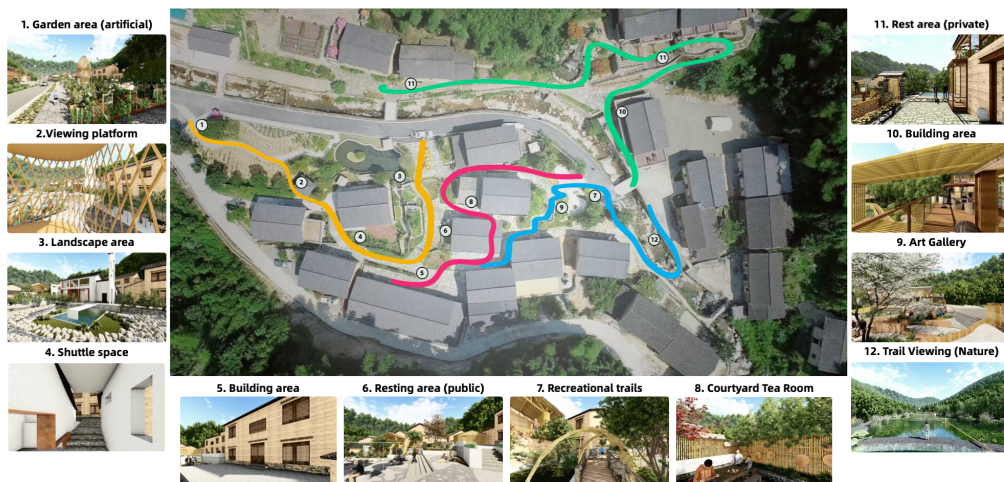


Figure 5-3 Map of random route selection and scenarios image

(1) Demographics of the interviewees, such as their age, level of education, and employment history; (2) frequency of travel to rural areas; (3) the behavior selected and the motivation being chosen; and (4) the respondents' choice for 12 landscape images. (5) The choice of respondents for various regions across 12 entropy pictures. (6) Traveling's emotional state during the 12 points (7) Use of the entropy-based method as a tool to interview the different roles during the design and construction process..

A Likert scale of 1–7, with 1 denoting "dislike very much " and 7 denoting "like very much" was used to evaluate the respondents' preference for landscape photos. The subjects were requested to report how much of the countryside they would want to see in the image before the experiment.

3. Results

3.1. Reliability

The SPSS 25.0 software was used to verify the reliability and validity of the data from the 87 questionnaires that met the eligibility criteria..

Reliability test: The Cronbach value was used to explore the reliability of the questionnaire data. A value higher than 0.8 indicated that the questionnaire data had a very high reliability; a value between 0.7 and 0.8 denoted that the reliability was high; a value between 0.6 and 0.7 implied that the reliability was acceptable; a value less than 0.6 indicated that the reliability was not good. The results showed that the reliability coefficient was 0.978, which is greater than 0.8, implying that quality of the data was very high.

Validity test: The KMO value was used to evaluate the validity of the data. A value higher than 0.8 indicates good validity; a value between 0.7 and 0.8 indicates good validity; a value between 0.6 and 0.7 indicates average validity; a value less than 0.6 indicates poor validity. The findings indicated that the KMO value of the data was 0.828, which is greater than 0.8, implying that the data had good validity.

3.2. Result of Sociodemographic Characteristics

The sociodemographic characteristics and recreational conditions of the respondents are shown in Table 5-1. The age of the interviewees ranged from 16–73 years old and most of the participants held a junior college or bachelor's degree. The frequency of recreation was relatively average. Interviewees who traveled in rural places once a half year or more accounted for 31% of the total participants. This finding indicates that the interviewees did not frequently travel to the rural places. Recreational activities reported by the subjects included walking, sitting, resting, photography, drinking tea and chatting and Scenic view which accounted for over 10% of the total.

Table 5-1 Result of Sociodemographic characteristics

Sociodemographic characteristics		Number	%
Age	< 17	3	3.4%
	18-44	73	82%
	45-59	9	10.1%
	> 60	4	4.5%
Educational background	High school and below	13	14.6%
	Junior college or undergraduate	71	79.8%
	Graduate student or above	5	5.6%
Recreational situation Recreational frequency	Once a week or more	9	10.1%
	Once a month or more	26	29.2%
	Once a half year or more	28	31.5%
	Once a year or more	26	29.2%
Recreational activity (multiplechoice)	Walking	467	13.1%
	Running	91	2.5%
	Sitting and resting	514	14.4%
	Photographing	413	11.6%
	Climbing and Scenic view	129	3.6%
	Drinking tea and chatting	423	11.8%
Participate in handicraft activities	149	4.2%	

	Exercise and dance	98	2.7%
	Playing Chess and Cards	166	4.6%
	Reading and listening to Songs	289	8.1%
	Fishing	118	3.3%
	Scenic view	386	10.8%
	Drawing and practice	146	4.1%
	Sing	86	2.4%
	Camping	99	2.8%

3.3. Correlation analysis of all variables

Correlation analysis helped study the total score and the number of behaviors of 12 nodes (Figure 5-4). The correlation between 5 items namely selection psychology, red area, green area, and the blue area was conducted in this study (Figure 8). Pearson’s correlation coefficient was used to indicate the strength of the correlation. Analysis of scenario 1 showed that all five items in scenario 1 were significantly correlated, with correlation coefficient values of 0.289, 0.511, 0.543, 0.494, and 0.357. The correlation coefficient values were greater than 0, indicating that the total score and behavior quantity, choice psychology, red area, green area, and blue area were positively correlated. However, the correlation between behavior quantity, green area, and blue area was insignificant. The correlation between the items was visualized using a heat map (Figure 5-4). The correlation between the number of behaviors and the total score, choice psychology, red area, green area, and blue area was weak (Figure 5-4). The number of behaviors in scenario 1 was correlated with the green area. The correlation between number of behaviors and the blue area was insignificant. The correlation between the number of actions and the red and cyan regions was insignificant in scenario 2. The correlation between the number of actions in scenario 3 and the red region was insignificant. The correlations between the number of actions in scenario 6 and the green and blue areas were insignificant. The standard deviation of the number of behaviors was large, due to the influence of factors such as tourists' behavioral preferences and activity preferences.. (Details of results are in Appendix4)

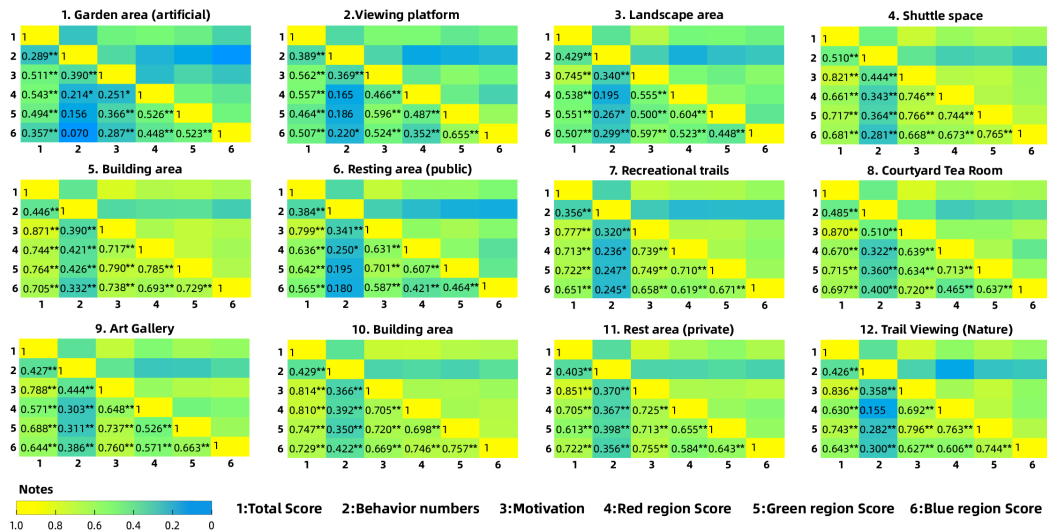


Figure 5-4 The heat map of correlations between variables.

The degree of positive correlation between behavioral motivation and the total score was relatively the largest. It was followed by a relatively large positive correlation degree between the three regions and the total score, and the specific degree of correlation varied in each scene. Analysis of the average experience score of each scenario showed that the red area scores were lower, and the green and blue areas scores were higher. However, the three scores were lower than the overall

experience score of the scenario. Therefore, the experience of the local landscape in each scene cannot represent the overall experience. These findings indicate that the overall experience was superior to the landscape experience of a single area.

3.4. Relationships of passive enjoyment and active enjoyment

The visualization cube was to present the information of the 12 scenarios based on the results (Figure 5-5). Several studies have explored the relationship between passive and active enjoyment. In this study, the psychology, landscape services, behavior, and tourism were explored, as they are important components of the tourist experience. As a result, it is imperative to evaluate these components in the context of actual project practice. The number of behaviors responds to the landscape's possible behaviors. The psychological feeling indicates the clarity of the user's motivation to choose a specific behavior. Notably, the relationship between active enjoyment and passive enjoyment is correlational rather than causal. Correlation and regression analyses were conducted to further explore the relationship between active enjoyment and passive enjoyment using SPSS 25.0.

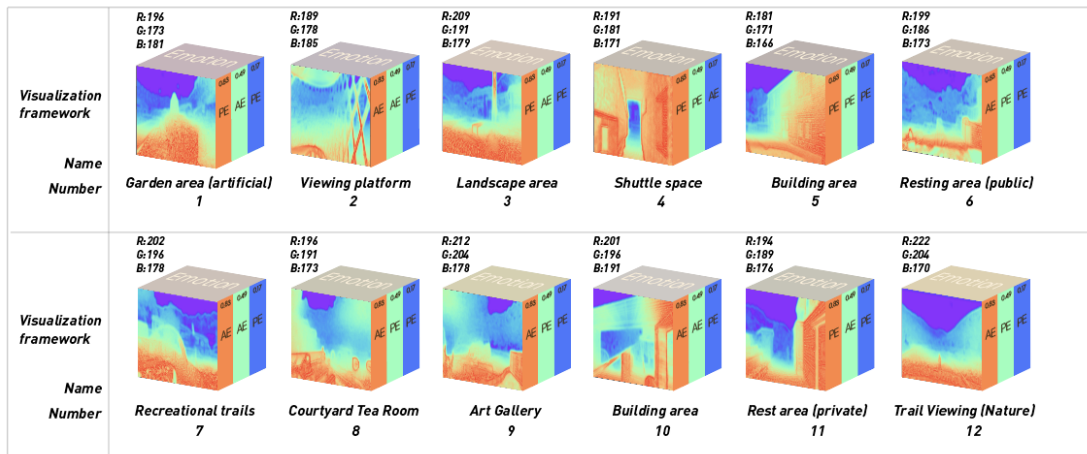


Figure 5-5 Visualization cube of the 12 scenarios

3.4.1. Correlation and Regression Analysis of behaviors and motivation

In this study, correlation and regression analyses were performed to evaluate the relationship between behavior and motivation to determine the optimal combination of passive and active enjoyment.

Table 5-2 Model summary.

ANOVA ^a						
	Model	Sum of square	Degrees of freedom	Mean square	F	Significance
1	Regress	1.249	2	.624	71.350	.000b
	Residual	.079	9	.009		
	Total	1.327	11			

a. dependent variable: Experience value; b. Predictor: (constant), BV, MV

Table 5-3 Result of Parameter estimation.

Coefficient ^a						
Model		Unstandardized coefficients		Standardized coefficients	t	Significance
		B	Standard error	Beta		
1	(constant)	-.811	.533		-1.522	.162

	Behaviors	-.059	.048	-.117	-1.232	.249
	Motivation	1.193	.110	1.025	10.818	.000

a. dependent variable: Experience value

The model R² value was 0.941, implying that the number of behaviors and psychological feelings can explain 94.1% of the cause of change in the value of the tourists' experience during the tour. The regression model passed the F-test (F=71.350), indicating that at least one of the variables had an influential relationship on satisfaction (Table 2). The behaviors, motivation and total scores, these three previously mentioned variables were significant, thus there were no excluded variables in this analysis. The B-values of the behaviors and motivation variables in the model were -0.059 and 1.193, respectively, indicating that the number of behaviors had a significant negative influence relationship on the experience value whereas users' motivation had a significant positive influence relationship on the experience value (Table 3). A simple multiple linear regression model was constructed based on the regression coefficients. The regression equation was: Experience value = -0.059*Behaviors + 1.193*Motivation

3.4.2. Definition and Description of the Relationship between passive and active enjoyment

As shown in figure 5-6, the x-axis of the coordinate axis, the possibilities offered by landscape services in the scene. The y-axis of the coordinate axis indicates the degree of clarity of the tourists' psychological motivation to choose a behavior or activity in the scene. A high score indicates high clarity and motivation to choose a specific activity. Landscape functionality is mainly reflected by a rich set of specific functions to choose from. A high clarity of motivation is correlated with a strong user's internal purpose. A low clarity of motivation is associated with a random user's behavior choice, which is dependent on external stimuli and environmental changes.

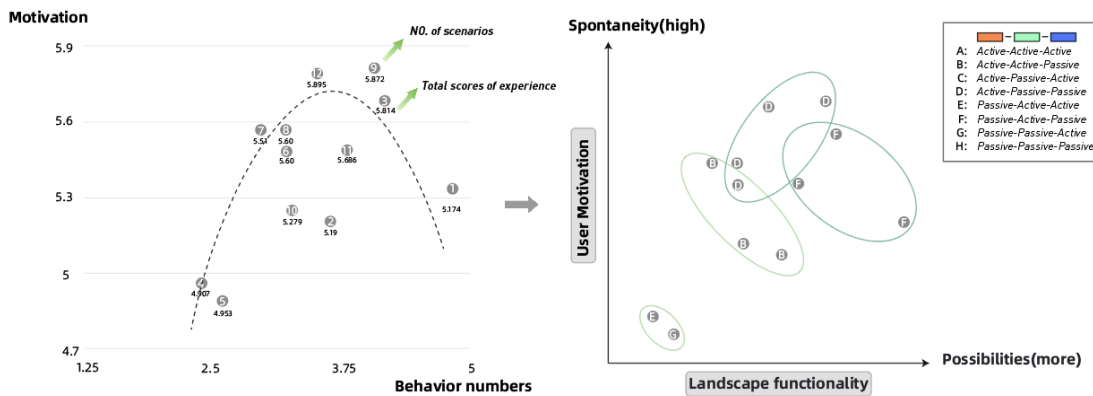


Figure 5-6 Combinations of passive enjoyment and active enjoyment by entropy images.

Pearson correlation analysis showed that the motivation of visitors and the overall rating are significantly positively at a 0.01 level correlation with a correlation coefficient of .965 (P < 0.01). However, the correlation between the number of behaviors and the overall rating was insignificant. These findings indicate that tourists have higher rating degrees for both modes of Active-Passive-Passive enjoyment and Passive - Active -Passive enjoyment. Motivation and behavior possibilities were high. Therefore, the mutual matching of Active and Passive was an essential factor to enhance tourists' experience in the red and green regions, whereas passive enjoyment was dominant in the blue region. Active - Active -Passive enjoyment exhibited relatively lower motivation and behavior possibility. It is easy to exhibit active enjoyment if the choice of behavioral possibilities is relatively small, and the choice of behavior, the psychology can easily generate a vague feeling.

In summary, the two combinations of Active enjoyment-Passive enjoyment – Passive

enjoyment and Passive enjoyment – Active enjoyment – Passive enjoyment (D and F in the figure 6) results in a better visitor experience in traditional village tourism. The behavioral and psychological motivation that users can exhibit for landscape services is positively correlated with the experience of visitors.

3.5. Analysis of experience emotions

According to the nodes' distance and design, we arbitrarily selected four routes and inserted them into the visualization system.

3.5.1. Correlation analysis

The yellow route comprised scenarios of No.1, 2, 3, 4, 5, 6, the red route comprised scenarios of No.3, 5, 6, 7, 8 and the blue route comprised scenarios of No.5, 7, 9, 12; the green route comprised scenarios of No. 10, 11, 12, as shown in figure 5-3 . The average experience of the fourth small line was optimal, and the average ex-perience of the first line was poor. The overall score of the first line was lower than the overall experience score. The average scores of the second, third, and fourth lines were higher than the overall experience score. This indicates that the first line can improve the score of pleasure.

Correlation analysis was conducted to explore the correlation between scene evaluation and negative emotions, novelty, excitement, and pleasure. The results showed a significant negative correlation between scene evaluation and negative emo-tions. The correlation between scene evaluation and novelty was significantly positive. The correlation between scene evaluation and excitement was significantly positive. The correlation between scene evaluation and pleasure was significantly positive.

Among the four lines and the correlation in the overall experience, we see that the scene experience has the strongest correlation with pleasure and the weakest sense of novelty. Novelty and excitement are strongly correlated (Table 5-4,5,6,7,8).

Yellow route:

Table 5-4 Pearson correlation test

	Mean	Standard deviation	Negative emotion	Novelty	Excitement	Joy	Scene evaluation
Negative emotion	2.539	1.193	1				
Novelty	4.854	1.230	-0.378**	1			
Excitement	4.962	1.110	-0.407**	0.841**	1		
Joy	5.338	0.872	-0.461**	0.814**	0.897**	1	
Scene evaluation	5.486	0.754	-0.452**	0.817**	0.849**	0.928**	1

* $p < 0.05$ ** $p < 0.01$

Red route:

Table 5-5 Pearson correlation test

	Mean	Standard deviation	Negative emotion	Novelty	Excitement	Joy	Scene evaluation
Negative emotion	2.411	1.180	1				
Novelty	4.827	1.226	-0.303*	1			
Excitement	5.159	1.085	-0.372**	0.790**	1		

	Mean	Standard deviation	Negative emotion	Novelty	Excitement	Joy	Scene evaluation
Joy	5.469	0.967	-0.418**	0.709**	0.923**	1	
Scene evaluation	5.676	0.848	-0.305*	0.721**	0.843**	0.879**	1

* $p < 0.05$ ** $p < 0.01$

Blue route:

Table 5-6 Pearson correlation test

	Mean	Standard deviation	Negative emotion	Novelty	Excitement	Joy	Scene evaluation
Negative emotion	2.335	1.154	1				
Novelty	4.398	0.875	0.145	1			
Excitement	5.311	0.934	-0.301*	0.605**	1		
Joy	5.607	0.900	-0.308*	0.573**	0.929**	1	
Scene evaluation	5.810	0.787	-0.268*	0.657**	0.861**	0.889**	1

* $p < 0.05$ ** $p < 0.01$

Green route:

Table 5-7 Pearson correlation test

	Mean	Standard deviation	Negative emotion	Novelty	Excitement	Joy	Scene evaluation
Negative emotion	2.371	1.198	1				
Novelty	4.950	1.209	-0.273*	1			
Excitement	5.376	0.956	-0.348**	0.781**	1		
Joy	5.641	0.914	-0.419**	0.706**	0.903**	1	
Scene evaluation	5.828	0.765	-0.487**	0.706**	0.870**	0.911**	1

* $p < 0.05$ ** $p < 0.01$

Correlation analysis of overall tourism:

Table 5-8 Pearson correlation test

	Mean	Standard deviation	Negative emotion	Novelty	Excitement	Joy	Scene evaluation
Negative emotion	2.420	1.113	1				
Novelty	4.894	1.131	-0.341**	1			
Excitement	5.177	0.961	-0.391**	0.861**	1		
Joy	5.497	0.830	-0.449**	0.791**	0.926**	1	
Scene evaluation	5.668	0.710	-0.444**	0.825**	0.887**	0.935**	1

* $p < 0.05$ ** $p < 0.01$

3.5.2. Regression Analysis of Sentiment Variables

Linear regression analysis was conducted with joy, excitement, novelty, and negative emotions as independent variables and the scene evaluation as the dependent variable. The model formula was: scene evaluation = 1.511 + 0.675 * pleasure - 0.055 * excitement + 0.160 * novelty - 0.020 * negative emotion. The model R-square value was 0.895 (Table 5). These results imply that

pleasure, excitement, novelty, and negative emotion explained 89.5% of the changes in scene evaluation. The model passed the F-test ($F=113.511$, $p=0.000<0.05$), indicating that at least one parameter among pleasure, excitement, novelty, and negative emotions, impacted the scenario evaluation. The regression coefficient value of pleasure was 0.675 ($t=6.502$, $p=0.000<0.01$), meaning pleasure significantly affected scene evaluation.

Table 5-9 Linear regression analysis

	Unstandardized coefficients		standardized coefficient	t	p	R 2	Adjustment R 2	F
	B	standard error	Beta					
Constant	1.511	0.289	-	5.232	0.000**	0.895	0.888	F (4,53) =113.511, p=0.000
Joy	0.675	0.104	0.789	6.502	0.000**			
Excitement	-0.055	0.105	-0.075	-0.529	0.599			
Novelty	0.160	0.055	0.255	2.919	0.005**			
Negative emotion	-0.020	0.032	-0.032	-0.642	0.523			

Dependent Variable: Scenario Evaluation

* $p<0.05$ ** $p<0.01$

The regression coefficient of excitement is -0.055 ($t=-0.529$, $p=0.599>0.05$). This finding indicates that excitement does not affect the scene evaluation.

The regression coefficient value of novelty is 0.160 ($t=2.919$, $p=0.005<0.01$), indicating that novelty had a significant positive impact on scene evaluation.

The regression coefficient value of negative emotions is -0.020 ($t=-0.642$, $p=0.523>0.05$), implying that negative emotions did not affect the scene evaluation.

In summary, joy and novelty had a positive impact on tourist experiences, whereas excitement and negative emotion did not have a significant effect on tourist experience. Therefore, joy and novelty should be enhanced to improve tourist's experience. Excitement is often the anticipation of the next scene, and the evaluation of this scene does not have much impact. The exploration triggered by the unknown is exciting. Negative emotions have little effect on scene evaluation because positive emotions tend to cover negative emotions during the process. Therefore, the focus during the design project was on the beautiful landscape, comfortable environment, special activities, and avoid constructing several unnecessary facilities such as extreme sports facilities. The village tourist business is currently under operation. Tourists and locals report that the overall village has preserved a relatively complete traditional village appearance. The tourists reported that the overall tour experience was very good. Tourists can immerse themselves in the beautiful scenery and experience the traditional scenery. Some tourist find it fascinating to experience the events and play a role in increasing the community's services.

4. Discussion

This study takes the Yuan Touli traditional village in western Zhejiang Province as the research site. It emphasizes the entropy image-based approach and investigates the visitor experience during the entire tour of the traditional village. Based on the entropy image approach, the interaction of enjoyment and aesthetics in landscape service on the perception, emotion, and behavior of visitor experience is analyzed. It constitutes a dynamic strategy for combining landscape design and experience design, as Figure 5-7 shows.

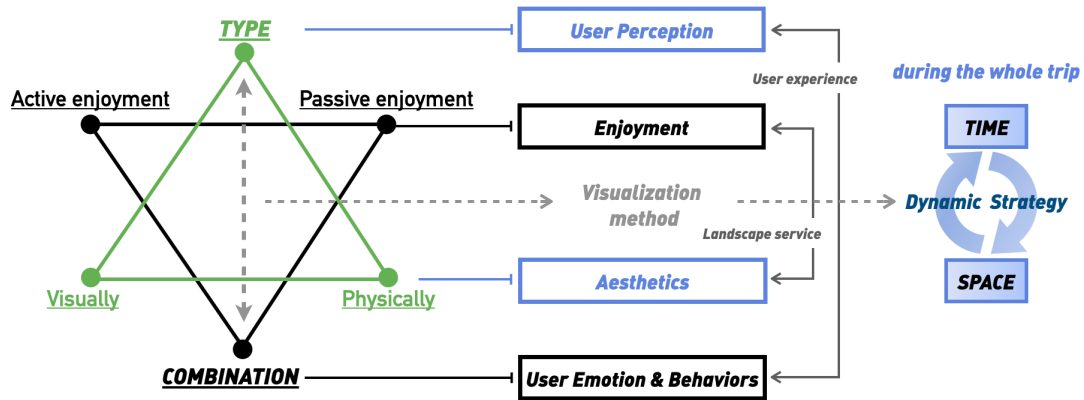


Figure 5-7 Framework of dynamic design strategy

The entropy image-based approach was used in this to explore visitor experience during a visit to traditional villages in China. The interaction of enjoyment and aesthetics in landscape service on the perception, emotion, and behavior of visitor experience was evaluated using the entropy image approach. The method comprises a dynamic strategy for combining landscape and experience design, as Figure 5-7 shows.

Landscape service and user experience were balanced throughout the design process. The findings showed that Types and Combinations were correlated with the user's experience. In addition, Type and Combination should be coordinated. Type was the foundation of tourist perception, and Combination was the enhancement of the tourist experience. The aim of the experience design research is to create high-quality experiences for tourists, thus service providers (developers and villagers) should work closely with tourists to understand tourist experience..

In summary, a dynamic design strategy based on landscape services and user experience is more effective. The visualization method has a dynamic application, which emphasizes the experience during the trip. It focuses on the dynamic experience of the space and time. The coherent experience of tourists in the village was simulated using the visualization cube to explore the tourist experience. The simulation provided design proposals of the landscape and community services. Visualization methods help de-velopers, villagers, and tourists to determine the problem and solutions together. Using these methods, everyone participates in rural construction and promotes development of inclusive tourism.

4. Conclusion

The aim of this study was to improve tourist experience by designing and establishing inclusive tourism in a traditional village. Firstly, a survey was conducted to explore the village tourism resources using enjoyment of LS+HLE strategy and the design goals were set. The Combinations and Types were analyzed based on the entropy image, and the visualization method and create a visualization system were proposed. The visualization system showed the results and analysis on the surface indicating that it is an efficient tool for establishing the participation design of different groups of people. Developers, villagers and tourists can focus on different tourism points and increase discussion and participation using this method..

The combinations of passive enjoyment and active enjoyment were further analyzed. The results showed that the optimized combinations were **Active enjoyment-Passive enjoyment – Passive enjoyment** and **Passive enjoyment – Active enjoyment – Passive enjoyment** (D and F), These combinations can be used to achieve a better visitor experience in traditional village tourism. A scenario for tourists was simulated to evaluate these two combi-nations. The design outcome that

suited the design concept was verified based on the combinations. Some community service designs, such as experiencing traditional pastry making activities, were added according to the tourists' emotion. The PE and AE combinations represented enjoyment of tourists, and can be used to formulate design strategies to avoid the design homogenization phenomenon..

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Chapter 6

Discussions and Conclusions

1. Discussion

This thesis's fundamental research is based on design practice, there are three levels of the process knowledge-generalizable pattern-design phase that correspond to the exploration and generation of rain evaluation in the design strategy. In this chapter, we focus on how to use the visualization method in design. We made the experiment and practice in Yuan Touli village which we used the visualization method during the whole design and construction progress of the project to understand the benefits and problems from different groups by using the visualization method and the result before.

1.1. Exploring design solutions from entropy image

According to visual focus, the clearer the distinction between the color areas, the clearer the vision of people. But in real life, there is rarely absolute clarity. Therefore, we can see that the entropy image of the rendering picture is clearer than the real photo.

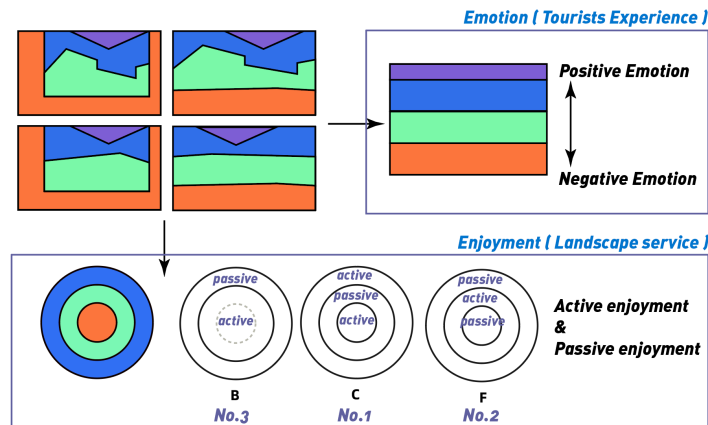


Figure 6-1 Emotion tendency and optimal enjoyment combination

According to the previous test results (figure 6-1), the experience score in the red area is always lower than that of the blue area, which is more inclined towards negative emotions, while the green and blue areas have higher scores, which are more inclined towards positive emotions. Because the red area is close to the human eye, the details of the red area cannot be ignored.

At the same time, according to the regression equation for the types of enjoyment, positive emotions are more affected by the blue region. In contrast, the green and red regions have no obvious impact on positive emotions. Negative emotions are affected by the enjoyment types of the three areas, so paying attention to the landscape management and design of the red and green areas is necessary.

According to landscape services, in a certain scene, there is a certain overlap between passive enjoyment and active enjoyment, so we can subdivide their combination relationship. From the analysis of the two villages, the blue area is more passive enjoyment, the green and red areas are more active enjoyment of landscape services, and the active enjoyment area is more focused on the design of community activities and the construction of infrastructure. The area inclined to passive enjoyment is more focused on landscape planning and design.

Enjoyment in landscape service emphasizes the service and impact of landscape on people. Tourist experience refers to how tourists feel about the environment and services. Tourist emotions are often immediate, with negative and positive emotions, while enjoyment is a coherent process experience, which is a positive influence. We also found that during the tour, negative emotions are often covered by positive emotions, and positive emotions have a greater impact on pleasure and novelty.

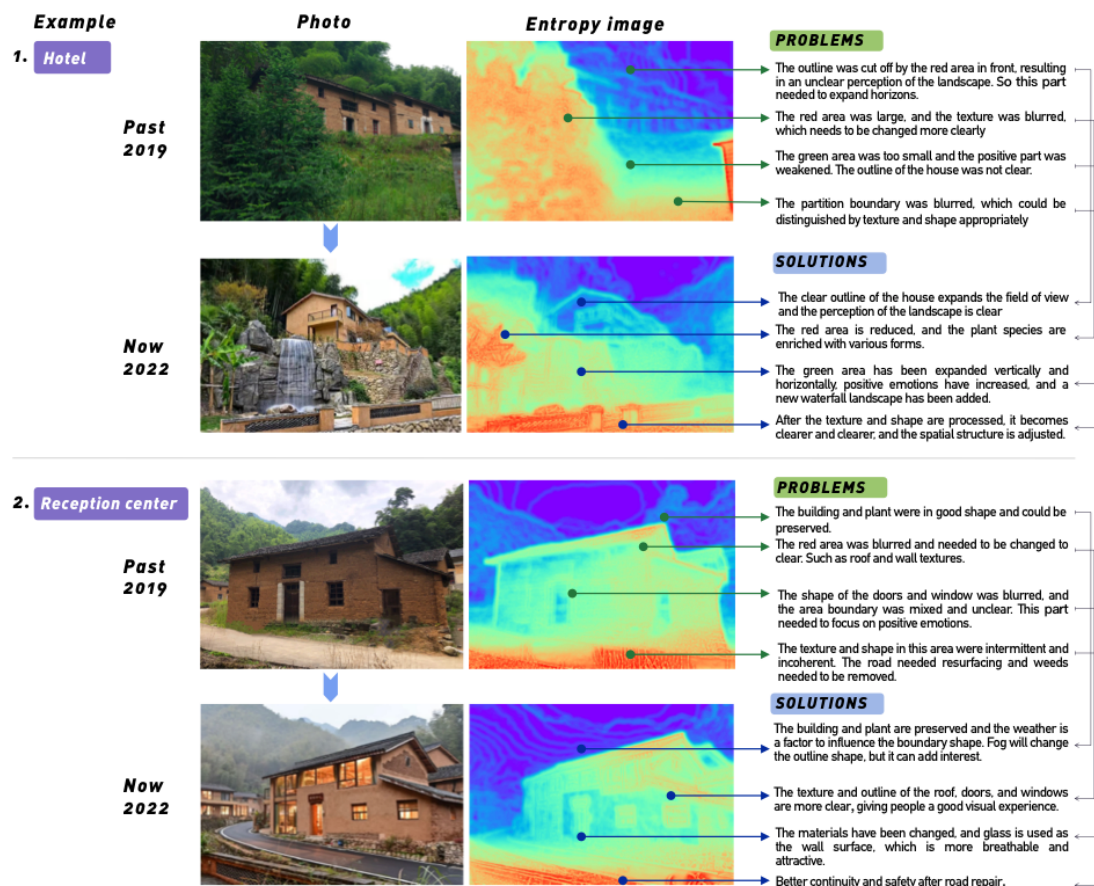


Figure 6-2 The examples of finding problems and solutions from entropy image

There are two examples (figure 6-2) that we use the entropy image to analyze the problems and the solutions. We think about the solutions based on the following points: 1. How to expand the positive emotions of tourists and weaken the negative emotions of tourists. 2. If the shape and texture are not bad, whether it could be preserved and dealt with in the form of maintenance. 3. Whether the division between regions is clear (the difference between different colors is obvious), and how to make the blurred regions clear. Generally, we could analyzed from two aspects: the landscape aesthetic perception and the emotion of the tourist, By using the entropy image based visualization method, it can help developers clarify the design points of the solution.

1.2. Visualization Surface design

No.1 and 2 represent the navigation bar, and 3–9 denote the operation display bar (Figure 6-3). The route selection area is indicated as 1. The relevant conditions of the route are observed when different routes are selected. The navigation bar of the operation display bar, including the map, emotion color, experience evaluation, simulation video, and analysis, is presented as 2. The map comprises routes and cubes. In the figure, 3 and 4 indicate the cube after selecting the node in the route.

The combination change is displayed below the cube, and the design plan can be considered according to the definition of the combination. The emotion color of the whole route is displayed in RGB mode as 7. The triangle represents analysis of positive emotion. The experience evaluation showed three different areas (red, green and blue) of experiential scoring in entropy. The computer graphic shows a dynamic video of the walking simulation on this route. The analysis includes 5 and 6, whereby 5 represents the image and type, and 6 denotes the changing elements of type, namely physically, visually, shape, and texture. The overall operation depends on the multi-module linkage mode. For example, when the mouse is moved to the position of any keyframe in 5, the relevant data of the current keyframe are displayed in 7, 8 and 9, enhancing convenience for user operation..

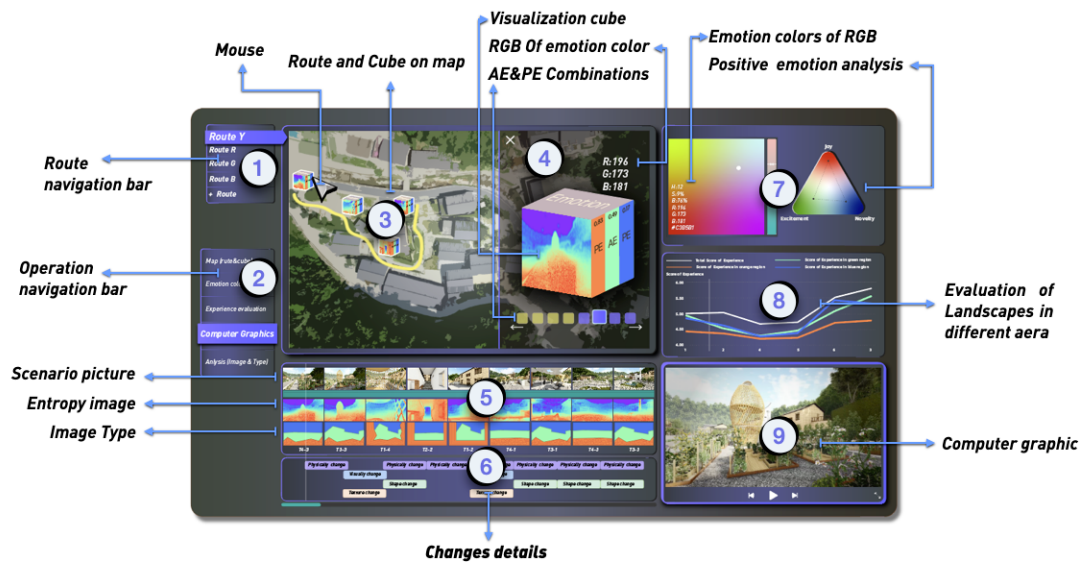


Figure 6-3 The surface of mapping of the visualization method

Mapping is a conventional way for designers to explore site problems. It allows designers to better explore the site's complexity and richness through the "detective" method. It even reveals the hidden site features for designers and presents us in a natural way. The daily living spaces inhabited are an effective means. Design services involve designers co-creating problems and solutions in an exploratory iteration process and solving the problem. As a result of the design, Shostack (1984) [1] proposed a visual representation of service design called a "service blueprint". It represents the customer's line of engagement and visibility with service personnel throughout the service experience. Others have also suggested interaction points between customers and service evidence [2] or touchpoints, "moments of truth" [3], and service leads [4] as important services element of design. User experience maps help visualize the entire end-to-end user experience, which facilitates goal achievement for the average user. It is independent of products and services and thus can help understand general human behavior on a larger scale. It assists organizations in visualizing a baseline understanding of the experience before considering a specific product or service.

In summary, the mapping was used to analyze the user experience after combining perception and emotion. The mapping is as a tool that predicts the design and provides references to designers, planners and other operators. Further research on Yuan Touli village was conducted using this method.

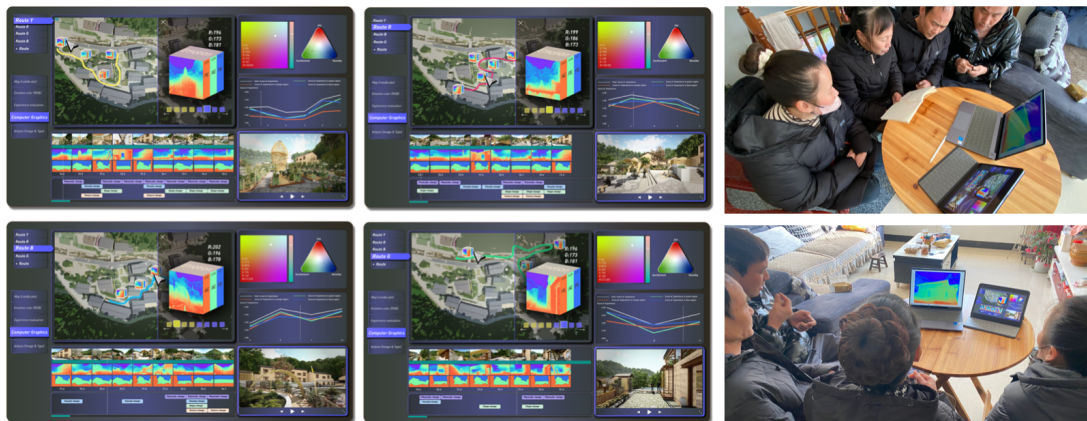


Figure 6-4 Mapping of the 4 routes and photos of discussions of rural people

1.3. Enlightenment of combination of passive enjoyment and active enjoyment

The findings indicated that active enjoyment and passive enjoyment occur simultaneously in tourism scenarios (Figure 5-8). Today's rural tourism mainly focuses on leisure tourism and does not require specific local tourist spots. However, it requires an adequate relaxing ambiance. Therefore, the definitions of AE and PE are often approximate, and their effective combination improves the experience. For example, experiencing bamboo weaving in a house of a traditional village and experiencing bamboo weaving in a bright city room will bring different experiences as the scene's atmosphere improves enjoyability of the activity. This experience excludes the effect of the activity. The value increases through combination of the activities and the environment. Therefore, exploring the combination between activities and the environment in a specific scene helps in planning and design. Combination of designing the spaces, facilities, activities, and exhibitions improves the user experience. In this study, 12 scenes in Gaotiankeng Village were mapped and analyzed. The two villages are traditional villages, and the plan and design measures are typical for traditional village tourism. The two villages are highly rated by tourists in the tourism industry, thus they were selected for comparison and analysis.

The results showed that Gaotiankeng Village had eight scenes on the right side and four scenes on the left side (Figure 11). Seven scenes were observed on the right area and five scenes on the left area of Yuan village. The Gao Tiankeng village was highly quaint, had more traditional houses, facilities, and landscapes used for planning compared with the Yuan Touli village. The 'tradition' was the key word to attract tourists, thus developers just renovated some destroyed landscapes. Yuan Touli village was a completely tourism village with several facilities and landscapes designed to attract tourists. Villages depending on landscape services had more nodes leaning to the right, and villages relying on community service design had more nodes on the left. Several nodes were also observed in the middle combinations. Combination of AE and PE in the scenarios during the whole travel experience is necessary. Analysis showed that the positive emotions of Gao Tiankeng Village were deep red, indicating that the village had mainly emotion of joy, whereas the overall color of Yuan Touli Village was deep green, indicating that it was mainly characterized emotions of excitement. These findings indicate that the scenic environment can increase the joy of tourists, and addition of community services, such as camping services and hand-made activities, can increase the excitement of tourists..

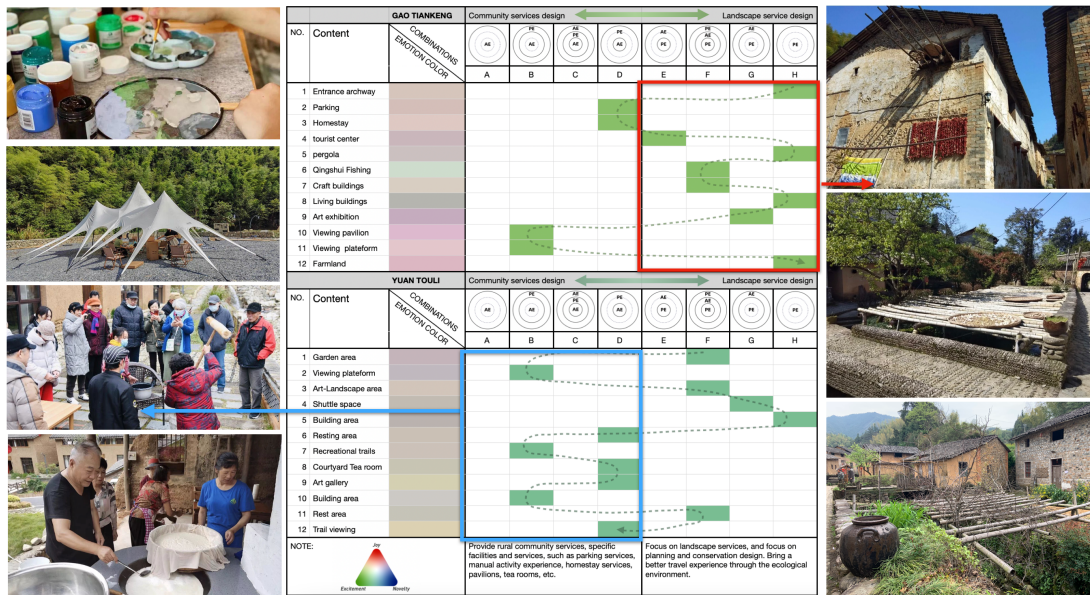


Figure 6-5 Comparing of the Gaotiankeng village and Yuan Touli village

1.4. Instruction of the applying the visualization method in rural tourism

Changes of the progress in the design project were mapped using the entropy method. The timeline is presented from the left to right in Figure 6-6. The project began at the end of 2019. The village was a completely damaged and deserted traditional village at that time. Our team (as developers) conducted a survey and proposed the scheme design. Then developers, villagers, and tourists used the entropy-based visualization method to present their ideas and discuss them as shown in the third stage. The previous plan was modified and implemented to form the photo presented in the fourth stage. The picture shows the interests, main operation, and the opinions of developers, villagers, and tourists, from top to bottom.

The traditional design process ends in the first and second stages. Tourists and villagers are not interested in participating after viewing the renderings. They believe that the design is the designer's responsibility, and they have no ability to present their ideas. However, project designed by the designer is meant to serve the villagers and tourists, so participation of all parties is necessary. The designer uses entropy images to analyze and test the design in the first and second stage, to comprehensively protect the tourism resources of traditional villages.

The three groups have their own new ideas and proposals after using this visualization method, and effectively communicate and inspire each other. The results showed that different groups of people have different concerns, and this complementarity improves efficiency of the plan. Several tourists visit the villages, and the villagers actively explore the various services they should provide to the tourists, such as making traditional snacks and local organic tea ceremony experience. Tourists will present their feedback and own ideas. This continuously enriches the content of the data, which can be regularly updated to serve as a reference pattern for other villages.

The specific content is presented in Figure 6-6. The results show that the visualization method is effective and practical. The method can be used as a tool for participatory design to stimulate the imagination and creativity of various groups of people. Several tests and facts indicate that the method is highly effective. In the past, the design process of a project was believed to be the work of designers, so the villagers and tourists had a negative attitude to the design. They just gave feedback on the rendering, as shown in step 1 and step 2 of the villagers and tourists in Figure 13. The entropy system was applied for step 3 and step 4 to the three groups. The results showed that the entropy system can be used as a participant tool to stimulate a discussion of the options of different people and effectively convey their comments.



Figure 6-6 The process map of using the visualization method of different roles

1.5. Interview for the different groups about their opinion to rural revitalization

Among the tourists we interview, 89% tourists think they will visit and live in the source again. The natural scenery is good, the air is fresh, and the content of negative oxygen ions is high, so they can sleep more deeply and feel better. The original appearance of traditional villages is enough to attract city tourists. People feel that these kinds of buildings, materials and patterns are novel, although they are traditional. A traditional village is like a living historical storybook, recording the village's culture and telling the villagers' stories. Many activities in the village make people feel hopeful. They can catch fish in the lake and go to the kitchen to cook after they catch fish and eat the freshest freshwater fish. There is also activities of the traditional way of rice harvesting, traditional rice cake making, wild camping, etc. These different activities make people expect and feel interested. At the same time, they can chat with local people and feel the local villages' uniqueness, making people want always to live there.

Last but not least, we make interviews to understand the benefits and problems from different groups by using the visualization method. Because of the Yuan Touli village was built well in 2022, June, so we have the chance to rich the research through different groups, especially tourists. We almost had deeply interviewed Developers, villagers, and tourists, and got a good response about the tourism in rural place. The interview outline is shown in Appendix 5.

Table 6-1 The benefits of applying the Base on Entropy-based visualization method to rural revitalization by comparing the comments of different groups

Compare dimensions	Architecture, landscape design	Community and service design	Environmental ecology	Sustainable economy
Entropy-based visualization method	Type of focus: Scenario design, route planning, understanding landscape perception Form: Architectural language related to residences such as morphological elements, roofs, patterns, etc. Matter: shape, color, material, size model	Focus on COMBINATIONS: as the tool of the participation design, community and service design Meaning: natural, political, economic, cultural context, etc. Design corresponding to meaning	Focus on protection and reservation: Combining with local resources, renewable and other elements are protected. Expand service types in line with the space environment.	Focus on recommendation and communication: Expansion and sustainability of tourist experience and industrial formats
Group1	· Convenient use of the visualization method can be used to effectively understand users and landscapes in the stages of design exploration, generation, and evaluation. · Have peace of mind about the outcome of the designed strategy making sure nothing breaks. · The design maximizes the usage of existing resources, building forms, and materials and protects nature and tradition. · Planning routes and sightseeing scenes	· It is clearer when negotiating with partners and villagers, and the design plan can be conveyed quickly. Shorten the design time cycle and improve efficiency. · Easy to help understand the meaning behind the plan, increase community tolerance, and understand each other between role groups	· Embodies caring cues. Let everyone consciously protect natural and cultural landscapes · Planning of natural landscape system, sustainable ecological construction. · Reconstruct the interaction between human and environment systems.	· Promote the development of tourism through landscape services · The beautiful and unique environment attracts a large number of tourists. · Local-based community building and project opening have increased tourist check-in and praise. Transformed into online traffic, increasing influence.
Group2	· It is easier to communicate with designers, and the government, and	· Independently increase community activities and services and actively communicate with tourists	· Can create an open environment to improve resident relations.	· There are more people visiting and increasing their income. Many young people are willing to return to their

	express design requirements. Ability to make relevant adjustments and plans based on the visualization results · Need to increase landscape maintenance and management.	-Actively help G1 to think about solutions together. ·Improved my own life and enhanced the satisfaction and quality of spiritual and cultural needs. Enhanced the awareness of cooperation and enhanced the sense of ownership.	Restructure the relationship of G1\G2\G3 multi-role. · Consciously protect, manage and publicize.	hometowns to help. Improve family happiness. · Tourists stay longer and increase the night economy. · Improved quality of life. A large number of employment opportunities are created through tourism.
Group3	·Increased viewing experience, avoiding negative emotions, and each area has something to look forward to. ·Saved time, did not take repeated sight routes and avoided missing tourist spots. · Efficiently give experience feedback to G1G2 to help build a better village.	·In the experience activities, it is very interesting to communicate with the local people, which increases the understanding of the local area. ·The different experience projects are exciting and unforgettable.	· Aware of the importance of ecological environment protection (reflection). ·I feel that the local people and the government have preserved the village so well, and I feel the charm of the traditional village.	· Will recommend traditional village tourism to people around. ·Combined with social platforms such as the Internet, we will continue to help traditional villages come into everyone's field of vision. · Influence the behavior and thoughts of future life
Note	The four development dimensions of inclusive tourism promoting rural revitalization are horizontal, and the application of entropy-based visualization method is compared among three different groups of people vertically; from left to right, the process is from direct impact to indirect impact.			

1.6. The relationship changes and design strategy through the visualization method

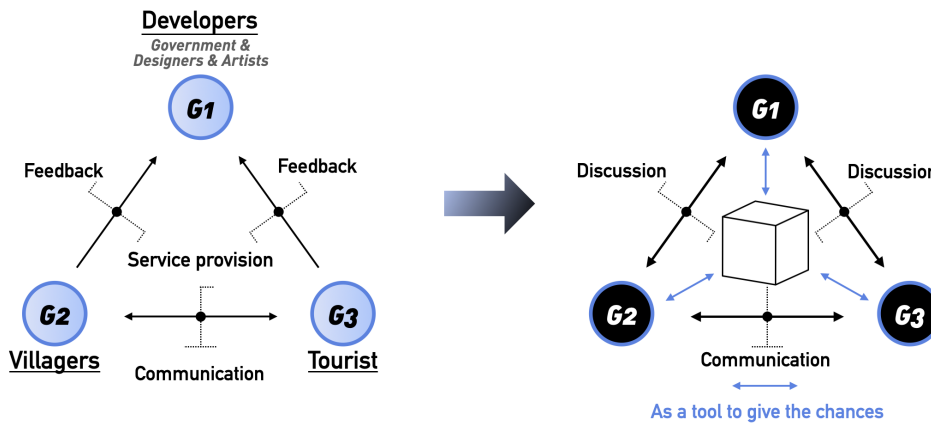


Figure 6-7 Relationships changes of the different groups

The relationship between the three groups (Developers/villagers/tourists mentioned in chapter 2) changed after using the visualization method. The main changes are from one-way to multi-way, from simple to in-depth communication. The villagers are willing to communicate with G1 and will put forward their ideas more clearly. Tourists and villagers can now discuss with G1 by giving feedback in the past, solve problems more efficiently and put forward their own ideas. The visualization-based method allows all parties to think and solve problems more practically, avoiding unconstrained and unreasonable ideas. At the same time, it also strengthened the communication among the three groups, increased the viscosity of the three parties, and provided realistic conditions for mutual trust, understanding of design, and planning strategies, and thinking about future development strategies.

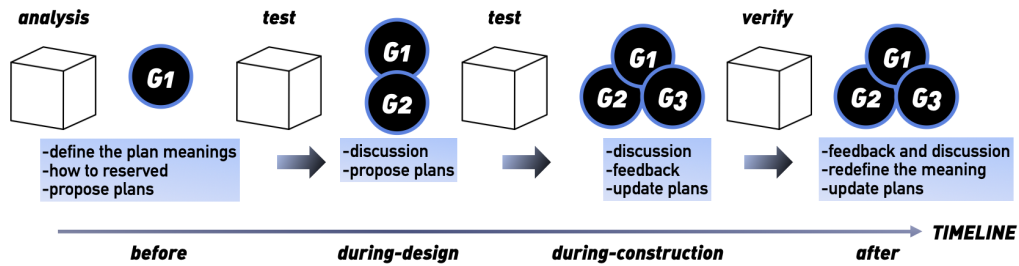


Figure 6-8 Applying strategy during the whole process of the project

According to the usage situation, according to the timeline of concept formation, scheme discussion, design implementation, feedback modification, and construction and use of the entire project, G1, G2, and G3 use visualization methods to have different functions (Figure 6-3). There are numerous opportunities for use as a tool in different populations. Generally speaking, there are three functions for the villagers: they can clearly put forward needs based on the images, facilitate participation in design and planning discussions, reflect on design strategies and services to allow villagers and tourists to participate, and can propose many problems that cannot be directly used based on visual images. Design requirements expressed in words. For the government, there are three functions: aiding design, helping verification, improving communication and designing projects. For tourists, it is similar to villagers. Still, the most important role is to help them improve their tour experience and conduct self-reflection on the renewal and development of traditional villages.

In the concept formation (before) stage, G1 used the visualization method to analyze the existing appearance, analyze whether the house form of the village is complete, whether the vegetation form is rich, etc., so as to determine the protection plan finally. Later in the design process, we invited G1 and G2 to participate to discuss the design plan and put forward their suggestions. According to the visualization method, both parties can clearly see which parts of the plan need to be improved. At the same time, for G2, it is clearer how to maintain in the future. During the construction, we will invite G1, G2, and G3 to conduct tests, estimate the experience of tourists during the tour, discuss the design plan based on the feedback from all parties, and update the design and planning plan. Finally, after the project is put into the market, we can verify the results through visualization, make further adjustments based on the feedback from all parties, and repeat the relevant content of the first stage to redefine the meaning and update the plan. Therefore, at different stages, there are different use emphases according to different user groups.

2. Limitation and future study

Regarding the study's limitations, the first is related to the method. Here are some questions that may arise about the method and how these may affect the results of the study: sample selection. When probability sampling/random sampling is not representative of the population being studied, the study then suffers from problems related to statistical "sample bias" or "selection bias". "Selection Bias" related issues. Second, we only investigated the existence of service, but not the specific service quantity and quality, which should be the topic of future studies. Third, the limitation of this study is that it focuses more on the user's perceptual experience, a large part of which is determined by vision and does not set the service effect part as a variable. Although this paper only takes a traditional village in a mountainous area of China as the research object, no matter how big the determined geographical span, the village tourism design should be consistent. These kinds of Methods are generic and make sense for rural landscape, urban planning, and park design. It is objective that rural tourism and services design is based on landscape and users.

3. The core innovation points

3.1. Visualization of aesthetic perception and tourism experience [5]

For landscape aesthetics, most people have a consensus. For example, the aesthetic preference for a clean and tidy landscape is better. And the description of "picturesque" is a consensus. Our problem is how to use design strategies to bridge the gap between the tourist experience and ecosystem services.

Currently, cognitive psychology and neuroscience generally believe that emotions and feelings play an integral role in human decision-making, they usually precede logic and analysis-based judgments, and can guide adaptive behaviors quickly and efficiently [6]. The spatial arrangement of landscape elements or patterns also affects the aesthetic experience, which may be due to "coherence"/"complexity" [7], and "prospect-refuge" [8]. The spatial layout described by such concepts can affect human's processing of information and positioning and movement in space. In this thesis, the types and forms of spatial layout of landscape elements and patterns can be visualized through the processing of entropy images.

Humans' aesthetic experience of environmental phenomena is direct and based on intuition. The complex psychological mechanisms behind it and the processes of perception, emotion and cognition have not been fully understood [9]. Nonetheless, quick and immediate aesthetic experiences or pleasant or unpleasant feelings may greatly influence people's decision-making and behavioral approaches to landscapes and their ecological integrity [10]. For example, traditional villages have been demolished and rebuilt because the villages are no longer suitable for the living or aesthetics of modern people, but these history and cultural elements were destroyed. Nevertheless, aesthetic experience may not necessarily reflect ecological processes and functions. At a time when the problem of environmental change is becoming more and more prominent, nature-based solutions have become an important way to improve human well-being. Therefore, we must actively respond to "how to reconcile aesthetics and ecology" [11] and combine inclusive tourism to promote sustainable regional development in the long-term challenge.

The thesis discusses the design strategy focusing on the landscape characteristics of traditional villages and the overall design strategy of the tourism experience [12]. This thesis argues that landscape architects, experience designers, and related practitioners need to integrate cultural sustainability into the protection, restoration, and creation of ecosystems to gain wider social recognition and support. As shown in the frame above, with the progress of the four experience stages (Chapter 3) of user perception, reflection, emotion, and reflection, the ability to design strategies is constantly expanding, and the realization of value is constantly increasing (Figure 6-1). For the overall design strategy, exploration, generation, and evaluation are in order, while the landscape design strategy based on caring cues highlights recognizability, communication, and consistency. Cues to care research explore what design and maintenance practices indicate that landscapes meet cultural expectations of maintenance standards.

Recognizability includes landscape form and human-landscape communication, communicability highlights the presence of imprints and caring intentions, and consistency highlights the consistency of landscape with local cultural and social norms. These three aspects need to be constantly emphasized in exploration, generation, and evaluation, and the two strategies are interrelated. According to the user's experience stage, recognizability, communication and consistency are developed in stages. For example, the landscape form is the first perception by people, while the caring intention and design trace are the reaction and emotional expression after perception. The two strategies are based on the tourism experience, and the other is based on the landscape environment. At the same time, due to the limitation of the scene requirements of rural tourism or traditional village tourism, these two strategies need to cooperate to enhance user's experience and protect the ecosystem. The dynamic design strategy proposed in the previous chapter

needs to be used in the exploration, generation, and evaluation stages. Furthermore, the depth of reflection and evaluation of local cultural and social norms is our future research direction.

3.2. The positioning of the design

Traditional dwellings are one of the most important material cultural heritages. The value of traditional rural dwellings is mainly reflected in the authenticity of architectural forms and building materials, which are crucial to the complete inheritance of their unique architectural styles. For modern traditional villages, there are fewer functional levels of space, such as leisure space, etc., used less by local villagers. At the same time, many tourism projects are affected by the season, and the utilization rate is low. Due to the severe problems of villagers, many villagers are reluctant to change their traditional way of life or build some buildings that do not conform to their aesthetics and habits. But for tourists, the natural environment and local characteristics of the countryside are the main attraction factors.

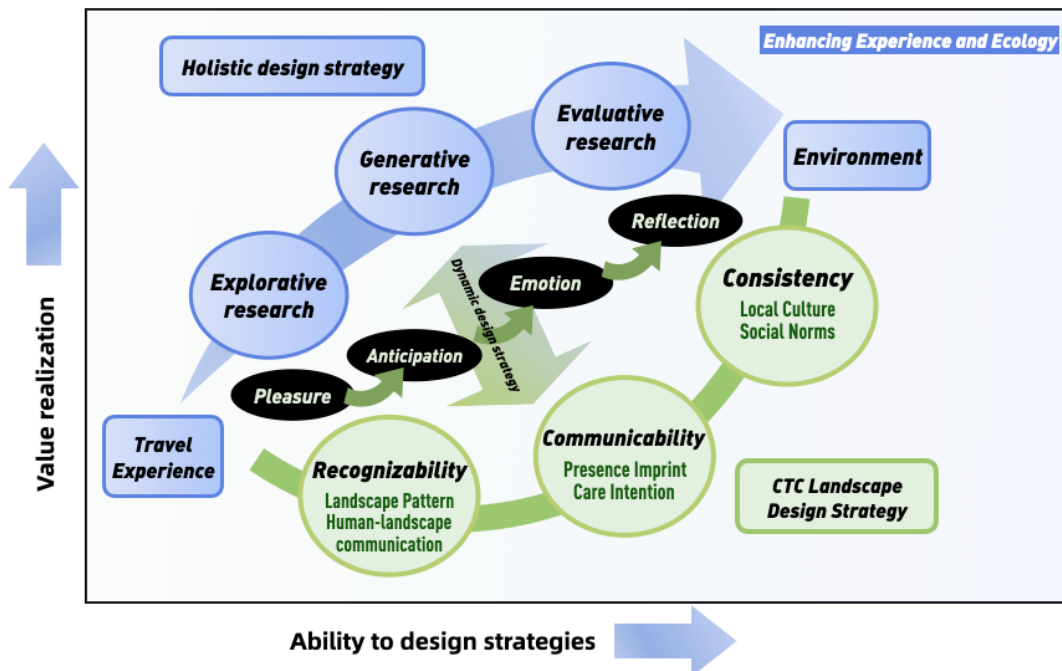


Figure 6-9 Design strategies framework

The difficulty of design point is that, on the one hand, the environmental characteristics, history, context and characteristics of villages are different. Though the differences between villages are obvious, the design of public facilities tends to be the same and homogeneity is increasing; on the other hand, due to people's lack of excavation of these cultures, cause to the village development convergence and the lack of characteristics leads to the lack of culture. For example, in the construction of the villages, the bluestone slabs removed from many old houses' floors were directly damaged. But the traces of history are left on the slate but thrown away as garbage. Therefore, in the design process, we prefer to keep such slates, which can be paved as the ground for public facilities or combined with artistic sculptures to form a unique artistic expression. Hence, we combine the LS+HLE to understand the ecosystem and culture ecosystem of the rural village is necessary.

3.3. The method of visualization cube

After clarifying the value of the landscape elements of traditional villages, the visualization

cube is applied to the tourists experience which we emphasize inclusive tourism of traditional villages. The application premise of the visualization cube is dynamic which emphasizes the experience during the whole trip that focuses on the dynamic experience of the spaces and time. We need to simulate the coherent experience of tourists in the village, so we try to use the visualization cube to analysis the experience and get design suggestions of landscape and community services (Figure 6-1).

Application in the exploration stage: In the exploration stage, the method can be tested according to the state before the renovation during the pre-study. The traditional villages' layout, spatial scale, and material texture have a long history. Therefore, visualization can be used to deeply explore the beautiful elements, such as traditional buildings. It can be used to explore the scenes that require significant repairs and those that should be slightly modified.

Application in the generation stage: The visualization operations can be used to effectively identify where the type should be changed, such as enriching the vision through texture and shape or changing the route to improve the experience. In addition, it can be used to determine where the combination should be changed to improve the user experience. For example, the Combination that favors PE can be used attract tourists by adding some community services such as setting the traditional handicraft activities.

Application in the evaluation stage: The evaluation stage is similar to the generation stage. The actual evaluation and feedback of the user experience can be carried out and recorded in the system at this stage. Further studies should be conducted and the system used to build a database to record tourist preference information. The method can be used in different villages allowing more people to participate in inclusive tourism.

4. Conclusion

The thesis is focus on tourists' experience design in rural tourism and try to study the design approach to connect the ecosystem and tourist.

Chapter 1 is the introduction of this paper, which introduces the research background, study areas, and research method. Research background includes China's "rural revitalization" policy and traditional village tourism. The research aims to propose a visualization method-based dynamic design strategy that explores a new balance between the visitor experience and the ecosystem.

Chapter 2 is about basic research. The summary of design practice and literature research, the service scenarios, landscape composition, and main groups (developers, villagers, tourists) of rural tourism that can help. The research uses questionnaires to study the landscape preferences of various groups for various service scenarios. The results showed that people highly preferred scores for native and necessary landscapes and gave low scores for exotic and conventional landscapes.

Chapter 3 further extends the second chapter. It introduces the term "servicescape" where we analyzed the primary factors and the relationship between servicescape and user experience. The chapter focuses on dividing servicescape into the main design, environmental atmosphere, and social and humanistic factors through variance, regression, and factor analysis, and divides user experience into perception, emotional, and reflection factors.

Chapter 4, according to the relevant landscape perception, we applied a visualization method based on image entropy and proposed a visualization framework that included landscape aesthetic type, landscape service combination, and tourist emotion color.

In Chapter 5, we conducted research and verification of two traditional villages in western Zhejiang, China. First, we subdivided the types into 16 categories, according to landscape aesthetics and visualization. We introduced its related classification of landscape services (LS) and historical landscape elements (HLE) into the research. The relationship between passive enjoyment and active enjoyment is subdivided into eight combinations, providing design suggestions.

Chapter 6 discusses the design strategies to develop traditional village tourism and the

advantages and limitation of the research. In the post-Covid-19 world, the design paradigms are shifting, and there are new upcoming opportunities and challenges in rural tourism. Finally, it provides a general discussion of the overall results and concludes the paper.

5. Design Criticism and Reflection

(1) **Generalization and transferability.** This study focuses on traditional villages in western Zhejiang, China. The context of traditional villages in China is complex, so there are many uncontrollable factors. However, overall, the experimental results verify the effectiveness of the visualization framework proposed in this paper. It is significant to promote a great design method or strategy to a wide range, and the practicability in other places needs to be changed and adjusted according to local conditions. Therefore, it is necessary to carry out project practice in different areas in the future to obtain a large amount of data and establish a database of user experience to provide designers and related managers with design and planning suggestions.

(2) **Participation and social inclusion.** Significant social engagement is a prerequisite for inclusive tourism. Inclusive tourism refers to government planning as the main body of service, tourism enterprises as the operating carrier, tourism community residents as the primary beneficiaries, and all sectors of society as participants in development (including tourists and civic organizations). Encourage social forces to participate in tourism development and allow more poverties to obtain equal employment opportunities to achieve a relatively fair distribution of tourism economic achievements. Reducing the social gap between rich and poverty through inclusive tourism. Creating a good tourism environment and ultimately achieving tourism inclusiveness development. The future research would focus on public participation, expand the number of participants, deepen the depth of participation, and expand the dimensions of participation.

(3) **Engagement of the public and authorities.** Fully mobilize the enthusiasm of developers group of government, artists, designers, entrepreneurs, villagers group and tourists group, enhance all their participation, and participate in regional revitalization more frequently, developing a sense of ownership, being equally and openly devotes itself to the development of villages in an active state.

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Appendix 1 Questionnaire Survey

Section 1: Background information

①. What is your gender?

- A. Male
- B. Female

②. How old are you?

Age_____

③. What is your identity in the rural tourism?

- A. Government official
- B. Villager
Farmer
Shop Owner
Other _____
- C. Tourist (without kids)
- D. Tourist (with kids)
- E. Villager with kids
- F. Designer
- G. Others_____

④. What is your level of education?

- A. Junior high school and below
- B. Senior high school/technical secondary school
- C. Junior college
- D. Undergraduate
- E. Master and above

⑤. What is your disposable average income?

- A. Within CNY 5000
- B. CNY 5001-10000
- C. CNY 10000-15000
- D. CNY 15000-20000
- E. Above CNY 20000

⑥. How many times do you travel every year on average?

Domestic within Province

- A. Once
- B. Twice~thrice
- C. Four times~five times
- D. Above five times

Domestic outside of Province (Overseas)

- A. Once
- B. Twice~thrice
- C. Four times~five times

- D. Above five times
- ⑦. What are main aspects of the village design?
- A. Landscape design
 - B. Housing design
 - C. Recreation facility design
 - D. Public facility design
 - E. Others
- ⑧. How do you travel the village?
- A. Package tour
 - B. Self-driving tour
 - C. Self-guided tour
- ⑨. What is most expecting aspect for the rural tourism?
- A. Enjoying the beautiful scenery and aerobic respiration.
 - B. Knowing local culture and regional customs
 - C. Feeling plantation and pasture, and contacting with small animals
 - D. Living life slowly
 - E. Tasting fresh peasant family food
 - F. Purchasing local featured products
 - G. Others
- ⑩. What do you care about following services in the process of the rural tourism?
- A. Food: Services centering on dining
 - B. Shelter: Services centering on accommodation
 - C. Transportation: Services centering on travel traffic
 - D. Use: Services centering on provision of specific items
 - E. Entertainment: Services centering on playing and appreciation
 - F. Commerce: Services centering on consumption and purchase
 - G. Learning: Services centering on learning

Section 2: Question of Preference information(include the results)

Differential analysis of different service scenes and landscape composition by different people groups./

		cases	mean	std	chi-square	p	statistically significant	χ	
Entertainment: Services centering on playing and appreciation	Specific services	Animal feeding	541	6.04	1.521	18.293	0.000	statistically significant	">G,TC>G,T>V,T>TC"
		Appreciation	541	5.09	1.878	15.896	0.001	statistically significant	">G,TC>G,T>V"
		Fishing	541	5.63	1.796	4.74	0.192	non-significant	
		Fishes and shrimps catching	541	5.6	1.744	5.706	0.127	non-significant	
		Farming experience	541	6.06	1.622	6.451	0.092	non-significant	
		Picking	541	6.4	1.605	4.726	0.193	non-significant	
		Contest	541	3.82	1.918	6.013	0.111	non-significant	
		Physical exercise	541	4.47	1.736	8.06	0.045	statistically significant	">G,T>V,T>TC"
		Dance	541	3.34	1.751	2.529	0.470	non-significant	
		Climbing	541	5.74	1.773	2.582	0.461	non-significant	
		Swimming and drifting	541	5.32	1.911	6.936	0.074	non-significant	
	Animal feeding scene	Drilling	541	5.35	1.749	1.357	0.716	non-significant	
		Sand J	541	5.47	1.878	2.652	0.448	non-significant	
		Wooded shed A, E	541	5.73	1.607	30.448	0.000	statistically significant	">G,TC>G,T>V,T>TC"
		Steel cage A, E	541	4.19	2.16	17.105	0.001	statistically significant	">G,TC>G,T>V,T>TC"
		Insect farm A, E	541	5.75	1.704	13.788	0.003	statistically significant	">G,T>G,V>TC"
	Do you think that the parents-child campaign needs specific scene or space?		541	1.53	0.499	2.677	0.444	non-significant	
	Parents-child campaign scene	Lawn B	253	5.57	1.799	25.808	0.000	statistically significant	">G,TC>G,T>V,T>TC"
		Green plants H	253	5.96	1.713	23.212	0.000	statistically significant	"TC>G,T>G,T>V,T>TC"
		Recreation facilities D-1	253	5.92	1.659	15.966	0.001	statistically significant	">G,T>V,T>TC"
		Public buildings E-2	253	5.36	1.559	27.538	0.000	statistically significant	">G,TC>G,T>V,T>TC"
		Landscape sculpture C	253	4.4	2.155	29.936	0.000	statistically significant	"TC>G,T>G,T>V,T>TC"
	Do you think that DIY activity needs specific scene or space?		541	1.42	0.494	2.219	0.528	non-significant	
	DIY activity scene	Public buildings E-2	313	4.56	2.025	21.886	0.000	statistically significant	"TC>G,T>G,T>V,T>TC"
		Tables and chairs D-2	313	6.2	1.39	9.784	0.020	statistically significant	">G,T>V,T>TC"
		Operating floor D-2	313	6.41	1.461	6.769	0.080	non-significant	
		Goods shelf D-2	313	6.16	1.658	11.225	0.011	statistically significant	">G,T>V,T>TC"
		DIY-finished product display D-2	313	6.1	1.704	10.786	0.013	statistically significant	">G,T>V,T>TC"
	Do you think that physical exercise, contest and outdoor training need specific scene or space?		541	1.31	0.465	1.067	0.785	non-significant	
	Physical exercise, contest and outdoor training scene	Lawn B	371	6.17	1.609	3.981	0.264	non-significant	
		Outdoor space B	371	6.33	1.385	2.638	0.451	non-significant	
		Runway D-1	371	5.63	1.616	2.836	0.418	non-significant	
		Sport equipment D-1	371	6	1.733	2.753	0.431	non-significant	
		Outdoor training facilities D-1	371	6.34	1.572	0.794	0.851	non-significant	
	Do you think that appreciation needs the scene of large area landscape area?		541	1.33	0.469	1.74	0.628	non-significant	
	Large area landscape area	Flowers and plants H	365	5.67	1.897	2.535	0.469	non-significant	
		Greenhouse B	365	5.56	1.698	3.994	0.262	non-significant	
		Pond G	365	5.11	1.58	6.171	0.104	non-significant	
		Forest H	365	4.93	1.686	5.522	0.137	non-significant	
		parking space E-2	365	5.77	1.58	6.857	0.077	non-significant	
	Do you think that watching recreational activities needs specific scene or space?		541	1.21	0.408	1.816	0.612	non-significant	
	Watching recreational activities scene	Lawn B	427	4.81	1.898	14.337	0.002	statistically significant	">G,TC>V,T>V"
		Square B	427	5.22	1.849	13.378	0.004	statistically significant	">G,TC>V,T>V"
Land J		427	5.69	1.698	6.997	0.072	non-significant		
Roadway F		427	4.52	1.832	11.371	0.010	statistically significant	">G,TC>V,T>V"	
Streetlamp etc. D-1		427	4.79	1.818	13.963	0.003	statistically significant	">G,TC>V,T>V"	
Logo and label, etc. C		427	5	1.67	10.978	0.012	statistically significant	"TC>V,T>V"	
Landscape sculpture C		427	5.2	1.74	8.639	0.034	statistically significant	">G,T>V,T>TC"	
Online sales		541	6.4	1.618	4.995	0.172	non-significant		
Offline sales		541	5.93	1.703	3.895	0.273	non-significant		
Commerce: Services centering on consumption and purchase	Sales channel method		541	6.55	1.369	8.764	0.053	non-significant	
	Offline sales scenarios	Trial experience	541	6.55	1.369	8.764	0.053	non-significant	
		Leisure space B	541	4.3	1.964	21.461	0.000	statistically significant	"TC>G,T>G,TC>V,T>V,T>TC"
		Plantation A	541	6.05	1.467	4.426	0.219	non-significant	
		Farm A	541	6.24	1.569	1.091	0.779	non-significant	
		Village fair B	541	5.76	1.753	6.279	0.099	non-significant	
		Supermarket E-2	541	4.29	1.772	17.995	0.000	statistically significant	"TC>G,T>G,TC>V,T>V"
		Greenhouse B	541	5.79	1.962	3.156	0.368	non-significant	
		Lawn B	541	4.04	1.89	7.01	0.016	statistically significant	">G,T>V,T>TC"
		Square B	541	5.46	1.576	1.56	0.669	non-significant	
		Corridor B	541	4.26	1.842	8.845	0.031	statistically significant	"TC>G,T>G,T>V"
	Greenhouse B	541	5.17	1.746	14.18	0.003	statistically significant	">G,T>V,T>TC"	
	Goods shelf D-2	541	5.17	1.737	8.426	0.038	statistically significant	">G,T>V"	
	Sign guide C	541	5.08	1.737	7.339	0.062	non-significant		
	Landscape sculpture C	541	3.69	1.735	5.339	0.016	statistically significant	">G,T>V,T>TC"	
Learning: Services centering on learning	Specific services	Hand-made experience learning	541	6.18	1.66	12.085	0.007	statistically significant	">G,T>TC"
		Experience and explanation	541	5.46	1.857	14.394	0.002	statistically significant	"TC>G,T>G,T>V"
		Exchanges and reading	541	5.1	1.724	17.893	0.000	statistically significant	"TC>G,T>G,T>V,T>TC"
		Interactive entertainment	541	5.81	1.818	18.286	0.000	statistically significant	">G,TC>G,T>G,T>V"
		Do you think that experience and plantation need crops?		541	1.18	0.385	3.398	0.334	non-significant
	Experience and explain the scene	plantation A	443	5.89	1.58	12.851	0.005	statistically significant	">G,T>V,T>TC"
		Fruits and vegetables H	443	4.68	1.851	16.802	0.001	statistically significant	">G,T>V,T>TC"
		Wooden shelf D-2	443	4.24	2.042	17.303	0.001	statistically significant	">G,TC>V,T>V"
		Greenhouse B	443	5.63	1.795	3.422	0.331	non-significant	
		Exhibition gallery E-2	443	5.48	1.805	5.43	0.143	non-significant	
		Farm Workshop E-3	443	5.92	1.596	10.052	0.018	statistically significant	"TC>V,T>V"
		Biochemical pool, composting plant, etc. E-3	443	3.91	1.815	11.991	0.007	statistically significant	">G,TC>V,T>V"
		Farming tools D-1	443	5.88	1.767	8.757	0.133	non-significant	
		Water wheel D-1	443	5.42	1.714	3.29	0.349	non-significant	
		Stone mill D-1	443	5.15	1.62	11.683	0.009	statistically significant	">G,TC>V,T>V"
	Museum, art gallery, etc. E-2	443	4.5	1.846	6.419	0.038	statistically significant	">G,T>V,T>TC"	
	Do you think that reading needs specific scene or space?		541	1.44	0.497	0.669	0.880	non-significant	
	Exchange reading space scene	Public buildings E-2	302	5.79	2.006	8.917	0.030	statistically significant	">G,TC>V,T>V"
		Tables and chairs D-2	302	6.42	1.425	7.152	0.067	non-significant	
		Sunny or rainy facilities D-1	302	5.5	1.826	7.725	0.040	statistically significant	"TC>G,T>G"
Square B		302	4.88	1.83	5.212	0.157	non-significant		
Pavilion B		302	5.57	1.665	11.354	0.010	statistically significant	">G,T>TC"	
Corridor B		302	5.48	1.703	6.365	0.095	non-significant		
Lawn B		302	6.05	1.672	4.323	0.229	non-significant		
Wood and bamboo forest H		302	4.87	1.814	9.025	0.029	statistically significant	">G,T>V"	
River water and pond G	302	5.76	1.67	9.501	0.023	non-significant			

Appendix 2

Questionnaire Survey

Section 1: Background information

- ①. What is your gender?
- C. Male
 - D. Female
- ②. How old are you?
Age_____
- ③. What is your identity in the rural tourism?
- H. Government official
 - I. Villager
Farmer
Shop Owner
Other _____
 - J. Tourist (without kids)
 - K. Tourist (with kids)
 - L. Villager with kids
 - M. Designer
 - N. Others_____
- ④. What is your level of education?
- F. Junior high school and below
 - G. Senior high school/technical secondary school
 - H. Junior college
 - I. Undergraduate
 - J. Master and above
- ⑤. What is your disposable average income?
- F. Within CNY 5000
 - G. CNY 5001-10000
 - H. CNY 10000-15000
 - I. CNY 15000-20000
 - J. Above CNY 20000
- ⑥. How many times do you travel every year on average?
- Domestic within Province
- E. Once
 - F. Twice~thrice
 - G. Four times~five times
 - H. Above five times
- Domestic outside of Province (Overseas)
- E. Once
 - F. Twice~thrice
 - G. Four times~five times
 - H. Above five times

- ⑦. What are main aspects of the village design?
- F. Landscape design
 - G. Housing design
 - H. Recreation facility design
 - I. Public facility design
 - J. Others
- ⑧. How do you travel the village?
- D. Package tour
 - E. Self-driving tour
 - F. Self-guided tour
- ⑨. What is most expecting aspect for the rural tourism?
- H. Enjoying the beautiful scenery and aerobic respiration.
 - I. Knowing local culture and regional customs
 - J. Feeling plantation and pasture, and contacting with small animals
 - K. Living life slowly
 - L. Tasting fresh peasant family food
 - M. Purchasing local featured products
 - N. Others
- ⑩. What do you care about following services in the process of the rural tourism?
- H. Food: Services centering on dining
 - I. Shelter: Services centering on accommodation
 - J. Transportation: Services centering on travel traffic
 - K. Use: Services centering on provision of specific items
 - L. Entertainment: Services centering on playing and appreciation
 - M. Commerce: Services centering on consumption and purchase
 - N. Learning: Services centering on learning

Section 2: Tourist experience

Firstly, according to your rural tourism experience in the Kaihua or Lin'an area (mountainous region), select the content in the illustration (multiple-choice Figure 3-1).

1. In which of the following scenarios would you prefer to do something related to eating? [Multiple choice][Image]

A. public space B. picnic C. shed D. pavilion

2. In which of the following scenarios would you prefer to do something related to dwelling? [Multiple choice][Image]

A. House B. RV C. Tent

3. In which of the following scenarios would you like to choose to carry out the way related to travel? [Multiple choice][Image]

A. Bus B. Biking C. Hiking D. Boating E. Self-driving

4. In which of the following scenarios would you prefer to do excursion-related activities? [Multiple choice][Image]

A. Fishing B. Rafting C. Feeding D. Climbing E. Picking F. Looking at the fields G. Countryside viewing H. Sunbathing

5. In which of the following scenarios would you like to choose to do something related to purchasing?
 [Multiple choice][Image]

A. Market B. Picking garden C. Pavilion roadside D. Sales space

Second, according to your rural tourism experience in the Kaihua or Lin'an area (mountainous region). Do you agree with the following statements? Please select the corresponding score according to the degree of agreement. (1 - Strongly disagree 2 - Disagree 3 - Not sure 4 - Agree 5 - Strongly agree) The main design elements and environmental atmosphere elements can be found in the following chart. Combine your experience to score [matrix questions]

Services Type	Tourism Servicescope							
Food services	Picnic scene 157	Pavilion scene 108	Public space 87	Picking scene 50	<p>Picture of scene</p> <p>Bazaar scene</p> <p>Name of scene</p> <p>How many times of Tourists choose this scene</p> <p>155</p> <p>Core-service area</p> <p>Atmosphere area</p>			
Shelter services	Buildings scene 168	Caravan scene 107	Camping space 88					
Transportation services	Self-driving scene 198	Riding scene 97	Hiking scene 73	Boating scene 56	Bus scene 40			
Entertainment services	Countryside viewing 145	Drifting scene 119	Climbing scene 112	Drying scene 109	Picking scene 93	Field viewing scene 82	Fishing scene 71	Feeding scene 63
Commerce services	Bazaar scene 155	Picking scene 125	Sales space 70	Pavilion-street scene 60				

The main object can be used effectively, and the basic functional facilities are intact (e.g., tables and chairs are not damaged and can block rainwater, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The scene space is well laid out, with planned functions (e.g. location, space size, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clear instructions to get to the location smoothly (e.g., there are roads to get there, there is a guidance system, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The main object has an aesthetic appearance (e.g., good-looking form, color, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The form of the main object has an artistic sense (e.g., with artistic landscape, sculpture, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The design has the characteristics of regional culture (e.g., there are unique local cultural elements, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The environmental landscape is aesthetic (beautiful and ecological)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental landscape form is rich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental landscape distribution is scaled	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a diversity of environmental landscape types	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The type of environmental landscape is novel and characteristic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The environment is clean and tidy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The landscape, space, and facilities are well maintained	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Landscape, space, facilities, etc. are relatively public and free	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The landscape, space and facilities are safe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The locals (or tourists) are friendly and welcoming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of the space is not charged and the price charged is reasonable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Third, according to your rural tourism experience in the Kaihua or Lin'an area (mountainous region). Do you agree with the following statements? Please select the corresponding score according to the degree of agreement. (1 - strongly disagree 2 - disagree 3 - not sure 4 - agree 5 - strongly agree) [paragraph description]

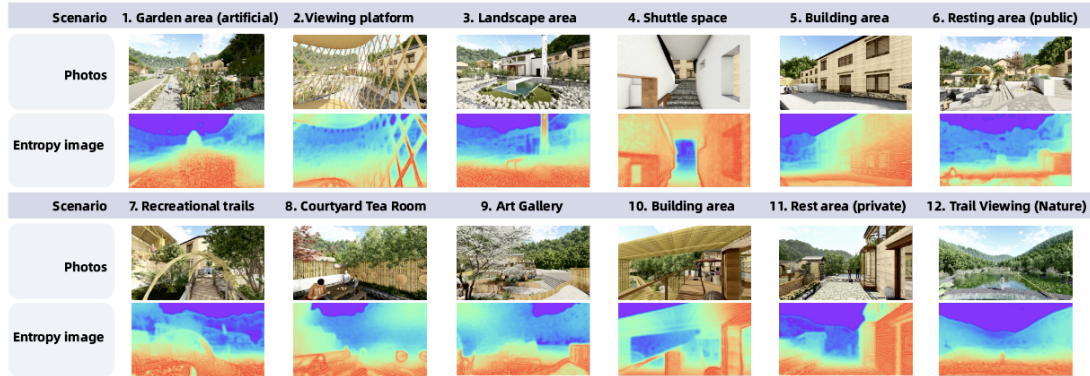
Rural tourism is a delight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Countryside tourism for people to enjoy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel free to travel to the countryside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel relaxed with rural tourism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rural tourism to relieve stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel at ease with rural tourism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exciting to play in the countryside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eye-opening tours in the countryside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel curiosity and anticipation in the travel experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling fresh in the travel experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel a sense of history for old buildings or landscapes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhances the emotions of family and friends who travel together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made new friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bringing strangers closer together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel the kindness and warmth of the local people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling good about life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More vision for future life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Open the pattern of your own thoughts (e.g., the power of rural revitalization)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bringing inspiration and creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Motivated to learn and live	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learn about the new regional culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix 3 Questionnaire Survey and Interview

Section 1: Background information (the same as before)

Section 2: Experience survey

Experience survey (Landscape preference) Next, there will be 12 pictures of scenes, please fill in according to your feelings. Please rate the artificial garden scene in the picture according to your personal preference [scale question] 1-7



Which activities would you like to do in the above chart? (Multiple choice)

- Walking
- Running
- Sitting and resting
- Photographing
- Taking pictures
- Viewing from a height
- Drinking tea and chatting
- Participating in handicraft activities
- Exercising and dancing
- Playing chess
- Reading books and listening to songs
- Fishing
- Viewing scenery
- Writing and painting
- Singing
- Camping
- +Other ____

Fifth, according to your rural tourism experience in the Kaihua or Lin'an area (mountainous region). Do you agree with the following statements? Please select the corresponding score according to the degree of agreement. (1-7 experience scores Figure5-6)

Red region	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green region	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blue region	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you feel comfortable?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you feel pleasant?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you feel enjoyable?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you feel relaxing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you feel fascinating?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you feel the anticipation?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Are you excited?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Are you surprised?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you rarely see such a village?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is it unique? (only seen here)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is it different from past experiences?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you experience something new?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you feel regretful?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Are you bored?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are you disappointed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do you feel sorry?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix 4

Pearson correlation test for each variable in Figure 5-6.

		Mean Standard	Deviation	Total Score	Behavior Numbers	Behavior Motivation	Red region	Green region	Blue region
1	Total Score	5.174	1.180	1					
	Behavior Numbers	4.837	2.881	0.289**	1				
	Behavior Motivation	5.337	1.307	0.511**	0.390**	1			
	Red region	4.721	1.547	0.543**	0.214*	0.251*	1		
	Green region	5.151	1.368	0.494**	0.156	0.366**	0.526**	1	
	Blue region	5.081	1.528	0.357**	0.070	0.287**	0.448**	0.523**	1
2	Total Score	5.198	1.327	1					
	Behavior Numbers	3.640	2.285	0.389**	1				
	Behavior Motivation	5.209	1.347	0.562**	0.369**	1			
	Red region	4.674	1.648	0.557**	0.165	0.466**	1		
	Green region	4.802	1.327	0.464**	0.186	0.596**	0.487**	1	
	Blue region	4.907	1.428	0.507**	0.220*	0.524**	0.352**	0.655**	1
3	Total Score	5.814	1.101	1					
	Behavior Numbers	4.174	2.808	0.429**	1				
	Behavior Motivation	5.686	1.191	0.745**	0.340**	1			
	Red region	5.000	1.549	0.538**	0.195	0.555**	1		
	Green region	5.628	1.107	0.551**	0.267*	0.500**	0.604**	1	
	Blue region	5.442	1.307	0.507**	0.299**	0.597**	0.523**	0.448**	1
4	Total Score	4.907	1.452	1					
	Behavior Numbers	2.384	2.036	0.510**	1				
	Behavior Motivation	4.965	1.537	0.821**	0.444**	1			
	Red region	4.535	1.657	0.661**	0.343**	0.746**	1		
	Green region	4.616	1.457	0.717**	0.364**	0.766**	0.744**	1	
	Blue region	4.605	1.521	0.681**	0.281**	0.668**	0.673**	0.765**	1
5	Total Score	4.953	1.413	1					
	Behavior Numbers	2.593	2.155	0.446**	1				
	Behavior Motivation	4.895	1.487	0.871**	0.390**	1			
	Red region	4.558	1.523	0.744**	0.421**	0.717**	1		
	Green region	4.744	1.449	0.764**	0.426**	0.790**	0.785**	1	
	Blue region	4.686	1.449	0.705**	0.332**	0.738**	0.693**	0.729**	1
6	Total Score	5.605	1.171	1					
	Behavior Numbers	3.802	2.704	0.384**	1				
	Behavior Motivation	5.488	1.215	0.799**	0.341**	1			
	Red region	4.942	1.358	0.636**	0.250*	0.631**	1		
	Green region	5.244	1.116	0.642**	0.195	0.701**	0.607**	1	
	Blue region	5.523	1.205	0.565**	0.180	0.587**	0.421**	0.464**	1
7	Total Score	5.512	1.361	1					
	Behavior Numbers	2.965	2.122	0.356**	1				
	Behavior Motivation	5.570	1.122	0.777**	0.320**	1			
	Red region	5.198	1.494	0.713**	0.236*	0.739**	1		
	Green region	5.116	1.376	0.722**	0.247*	0.749**	0.710**	1	
	Blue region	5.244	1.371	0.651**	0.245*	0.658**	0.619**	0.671**	1
8	Total Score	5.605	1.181	1					
	Behavior Numbers	3.209	2.098	0.485**	1				
	Behavior Motivation	5.570	1.184	0.870**	0.510**	1			
	Red region	5.395	1.286	0.670**	0.322**	0.639**	1		
	Green region	5.465	1.195	0.715**	0.360**	0.634**	0.713**	1	
	Blue region	5.407	1.341	0.697**	0.400**	0.720**	0.465**	0.637**	1
9	Total Score	5.872	0.992	1					
	Behavior Numbers	4.070	2.687	0.427**	1				

	Behavior Motivation	5.814	0.888	0.788**	0.444**	1			
	Red region	5.581	1.193	0.571**	0.303**	0.648**	1		
	Green region	5.674	1.111	0.688**	0.311**	0.737**	0.526**	1	
	Blue region	5.384	1.257	0.644**	0.386**	0.760**	0.571**	0.663**	1
10	Total Score	5.279	1.289	1					
	Behavior Numbers	3.267	2.139	0.429**	1				
	Behavior Motivation	5.256	1.399	0.814**	0.366**	1			
	Red region	5.151	1.368	0.810**	0.392**	0.705**	1		
	Green region	4.988	1.590	0.747**	0.350**	0.720**	0.698**	1	
	Blue region	5.279	1.469	0.729**	0.422**	0.669**	0.746**	0.757**	1
11	Total Score	5.686	1.161	1					
	Behavior Numbers	3.209	2.530	0.403**	1				
	Behavior Motivation	5.488	1.145	0.851**	0.370**	1			
	Red region	5.314	1.258	0.705**	0.367**	0.725**	1		
	Green region	5.384	1.180	0.613**	0.398**	0.713**	0.655**	1	
	Blue region	5.407	1.250	0.722**	0.356**	0.755**	0.584**	0.643**	1
12	Total Score	5.895	1.085	1					
	Behavior Numbers	3.512	2.279	0.426**	1				
	Behavior Motivation	5.791	1.169	0.836**	0.358**	1			
	Red region	5.419	1.288	0.630**	0.155	0.692**	1		
	Green region	5.721	1.175	0.743**	0.282**	0.796**	0.763**	1	
	Blue region	5.744	1.210	0.643**	0.300**	0.627**	0.606**	0.744**	1

* $p < 0.05$ ** $p < 0.01$

Appendix 5

Interview Outline in Yuan Touli village

GROUP 1: Interview Outline for Rural Development groups (Government, Designers, Enterprises)

Do you like the current development status of the village?

Do you think this visualization system is easy to use?

When would you use this visualization system? Or in what aspects?

How do you use this visualization for tourism design and planning? What progress has been made?

What influence on your decision or mind after using the visualization system?

How do you expect the rural landscape to change as tourism grows?

Please describe in detail.

GROUP 2: Interview Outline for Villager

How many years have you been in the village?

Do you like the current development status?

What do you expect to change in tourism development?

Which design impressed you the most? Or which changes in landscape, space, activities, services, etc. impressed you the most?

Do you think this visualization system is easy to use?

When would you use this visualization system? Or in what aspects?

How do you use this visualization for tourism design and planning? What progress has been made?

What influence on your decision or mind after using the visualization system?

How do you expect the rural landscape to change as tourism grows?

Please describe in detail.

GROUP 3: Interview Outline for Tourists

Do you often travel in a rural places? Do you like the development of Yuan Touli village?

How do you expect the rural landscape to change as tourism grows?

Are you influenced by village-developed strategy (in terms of tourism development and everyday life)? If yes, please describe it in detail.

What influence on your decision or mind after using the visualization system?

Which design or landscaping service impresses you the most? Or which changes in the landscape impress you the most?