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Efficacy assessments of public artworks intervening in rural built environments for tourism developments: a comparative study of two tourism villages in Hangzhou

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ABSTRACT

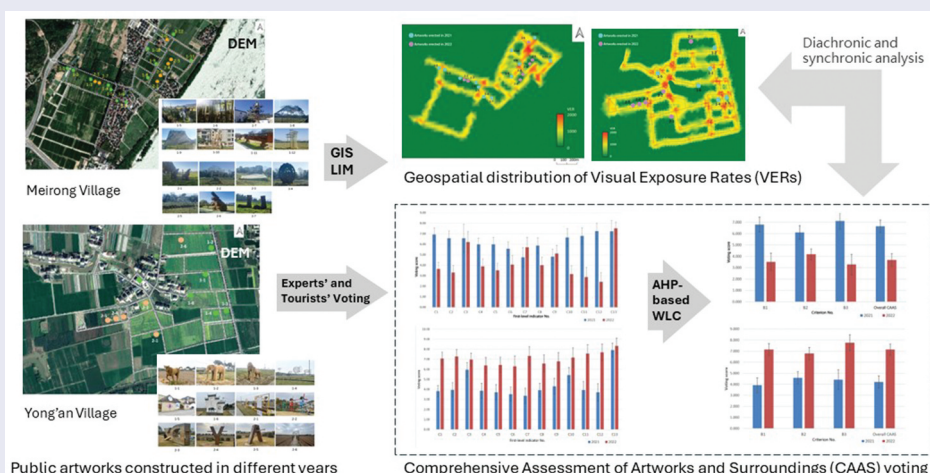
Interventions through rural tourism programs and rural art projects have played a significant role in rural revitalization initiatives in China, wherein public artworks have been deliberately integrated into rural built environments. This study combined both objective and subjective measurements, in two representative tourism villages in Hangzhou that underwent revitalizations. These artworks were strategically placed in the public domains of the villages in two distinct phases, enabling the calculation of their Visual Exposure Rates (VERs). Objective evaluations were gathered on-site via the Comprehensive Assessment of Artworks and Surroundings (CAAS) survey, and the data were subjected to quantitative analysis using the Analytic Hierarchy Process (AHP) method. The study reveals differential changes in VERs across the two villages, concurrently observing variations in the CAAS scores. Findings indicate the efficient promotion of fusion design to support sustainable rural tourism in three dimensions: spatial layout characteristics, cultural and aesthetic values, and tourism management practices. It suggested that sustainable rural tourism development should not hinge solely on increasing the quantity of public artworks but rather on the holistic improvement of sustainable spatial design and management to enhance the rural value chain, ensuring a more comprehensive and sustainable tourism experience

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Rural built environment; public artworks; efficacy assessment; rural art construction; environmental design



1. Introduction

1.1. Public artworks intervening in rural tourism

In the realm of rural sustainability, traditional villages embody a multitude of values extending across cultural, economic, ecological, industrial, and artistic domains (Li et al. 2024). Over the past decade, sustainable rural tourism has emerged as a pivotal constituent in the rural revitalization strategies of numerous East Asian countries (Zheng 2023). It serves a dual role,

stimulating rural economic progress while concurrently advocating for the preservation of local architectural heritage and the conservation of historically significant built environments. However, rapid urbanization has deeply impacted several traditional Chinese villages, leading to considerable challenges, exacerbated by the dearth of tertiary industry development (Meng 2023). Motivated by the rural revitalization agenda, tourism industries within emerging tourism-oriented villages have intervened decisively in

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propelling rural rejuvenation efforts. The development of sustainable tourism in rural built environments presents itself as both a protective measure and a developmental opportunity. Consequently, pragmatic design and management approaches tailored for rural tourism have gained escalating importance.

In the recent decade, public artworks have been utilised as “instruments” for embellishing and invigorating both urban and rural landscapes (Cheung, Smith, and Craven 2022; Guinard and Margier 2018), serves a dual-purpose: augmenting the aesthetic allure of built environments and directing public visual engagement and cultural consciousness towards specific architectural features and sites. Over the past decade, rural areas globally have witnessed the advent of arts festivals in tourist villages (Moore and Quinn 2023), where rural public art installations are frequently conceived and incorporated with their surrounding built fabric to act as magnets for festival-goers. Ubierna (2022) advocates for the integration of elements pertaining to public art into the realm of heritage tourism management.

Public artworks, recognized as an art form commonly employed to embellish and augment urban and rural built environments, have seen widespread application. In response to the evolving demands of rural tourism development over the last 10 years, the practice of constructing rural public art installations has been actively undertaken across a variety of rural built landscapes in Asian countries. The revitalizing effects of public arts intervening in a typical culture village regeneration program have also been evaluated quantitatively (Park and Lee 2014). Furthermore, some scholars have employed quantitative assessment methods to hierarchically describe and evaluate residents’ experiences with public artworks in abandoned mining villages in Korea, indicating that residents’ experiences and perceptions of public art projects are dependent on a continuous and intricate formation process (Gu and Lee 2023). These endeavours seek to align with and facilitate the burgeoning trend of rural tourism advancement.

1.2. The efficacy evaluation of rural tourism developments

Multiple scholars have introduced quantitative methodologies to evaluate the effectiveness of critical factors in rural tourism for specific East Asian villages and the performance of associated stakeholders. Notably, R. Huang and Bu (2022) advanced a distinctive model that zeroes in on destination attributes conducive to creating Memorable Tourism Experiences (MTEs), encompassing elements like gastronomy, accommodations, physiographic features, and rural lifestyle. Some studies have revealed that network configurations among tourism operators play a pivotal role in

shaping community citizenship behaviours and enhancing the efficiency of rural tourism initiatives (Ying, Jiang, and Zhou 2015). Moreover, Utami, Dhewanto, and Lestari (2023) employed purposive sampling to identify the central value concerns pertinent to the sustainability of tourism villages in Indonesia, subsequently proposing a groundbreaking rural tourism entrepreneurship framework for decision-makers. However, a noticeable limitation in these models is their neglect to account for tourists’ perceptions within small-scale rural built environments. Additionally, they generally overlook the importance of comprehensive assessments based on tourists’ objective evaluations or votes. This underscores the necessity for further research that integrates tourists’ viewpoints and empirical judgments into the assessment frameworks for rural tourism destinations.

Within the realm of applicable design methodology for rural tourism project design and management, the “value chain” theory has gained traction among scholars, notably espoused by Bhattacharjee and Saibaba (2018). The foundational concept of the “value chain,” originally articulated by Michael Porter in *Competitive Advantage*, pertains to a systemic framework that interlinks a diverse spectrum of “value activities” into an overarching value proposition. When conceiving rural landscapes, it is pivotal to contemplate a range of elements including culture, brand, products, ecology, and the human-built environment as integral components within this rural value chain.

By applying a judicious “fusion design” approach to the design and comprehensive management of rural tourism ventures, a harmonious synergy can be fostered between the rural milieu and the diverse sectors involved, ultimately culminating in a systematic upliftment of the rural value chain’s constituent parts. Nonetheless, despite its theoretical potential, the fusion-design-driven methodology has yet to permeate the mainstream practice of designing and managing public art and its corresponding environment in the majority of contemporary art village projects. The design, operation, and maintenance of public artworks and their surrounding rural landscapes frequently fail to fully capitalize on the comprehensive enhancement of rural cultural tourism values, a deficiency often rooted in the limited engagement of public artists, designers, and rural community members in the decision-making processes.

1.3. The efficacy evaluation of public artworks in rural built environments

Several key factors contribute to the value of public artworks and their environs in fostering rural tourism development. These encompass tourists’ receptivity and preferences, the unique spatial attributes of the locales, the artworks’ cultural and aesthetic

significance, as well as effective strategies for tourism administration and governance. Several pivotal factors contribute to the valuation of public artworks and their environs in stimulating rural tourism development, involving tourists' responsiveness and predilections, the unique spatial configurations of the locales, the cultural and aesthetic significance of the artworks, and efficacious tourism administration and governance strategies.

Firstly, the spatial layout attributes of a tourist village exert a substantial influence on tourists' perceptions and behaviors. Research has demonstrated that the spatial organization of historical heritage zones (Alfathani and Nurdini 2022), indigenous settlements (Nugraha 2022), commercial venues (Chen et al. 2023), social spaces, and tourism service infrastructure (Ding, Gao, and Ma 2022) can sway the influx of tourists and shape their perceptions of East Asian tourism villages. However, the objective effects of public artwork placements on tourists' perceptions and impressions have yet to receive dedicated scrutiny.

Secondly, the cultural and aesthetic experiences delivered to tourists are instrumental to the pragmatic design of public artworks (Durkin et al. 2020). Despite extensive assessments of the social and cultural worth of public artworks (Gurney 2018; Layne 2018), the influence of location on tourists' perceptions remains inadequately explored. Moreover, there is a gap in knowledge regarding the public artwork design employed in rural public artworks. Although it is common for professional public artists or landscape architects to dominate the creation of such works, they often overlook the interplay between the artworks, the local built environment, and the sustainability of the regional tourism sector. Additionally, some artworks fail to integrate the cultural and aesthetic values of the site and the active participation of local inhabitants (Liu, Lin, and Meng 2023).

Finally, rural tourism management practices can significantly sway tourists' objective evaluations of public artworks and their surrounding landscapes. Evidence shows that tourists' experiences vary significantly between service-oriented and tradition-focused tourism villages (Suryani et al. 2023). Tourists' willingness to visit revitalized rural villages is often swayed by management policies that impact the economic viability of rural tourism businesses (Wahyuni, Astara, and Dewi 2023). However, management aspects pertaining to rural art festivals are rarely addressed in existing studies that undertake a comprehensive assessment of rural public artworks and their ambient landscapes.

1.4. Aims of the research

This research aims to investigate the practical effectiveness of the design and management of public

artworks and their surroundings in two villages undergoing tourism revitalisation. Public artworks were installed in the public spaces of the two villages in two phases of rural art construction in 2021 and 2022. Empirical studies using both subjective and objective methods were conducted throughout 2021 and 2022. Based on the relevant literature and the in-situ built environmental conditions of these villages, the primary hypotheses of this study are as follows.

- (1) The comprehensive impression of tourists on rural public artworks and their surrounding environments is relevant to three aspects of factors, i.e., spatial layout characteristics, cultural and aesthetic, and tourism management.
- (2) The perception and preference of visitors to rural public artworks and their surrounding environments can be improved if these factors above are properly configured in the "rural value chain".
- (3) The sustainable rural tourism in rural built environments depends not only on the number of public artworks but also on the comprehensive improvement of sustainable industry and the fusion design approach.

2. Materials and methods

2.1. The study areas

2.1.1. Meirong village

Meirong Village, previously named as "Jiulizhou Village", locates in Tonglu County, Hangzhou, Zhejiang Province, China (119.47°E, 29.90°N). Meirong Village's southern side extends alongside the Fuchun River, which is a downstream tributary of the Qiantang River. With origins dating back to the Jin Dynasty era (266–420 A.D.), Meirong Village boasts a storied past that has attracted numerous illustrious figures throughout history. Renowned poet Lu You (1125–1210 AD) celebrated landscape painter Huang Gongwang (1269–1354 AD), and influential literatus Lin Zexu (1785–1850 AD) are among those who once graced its picturesque landscapes. Acknowledging its profound historical legacy, Meirong Village was officially recognized and listed in the "Fifth Batch of Chinese Traditional Villages" in June 2019.

In 2021, the Yuhang District Government of Hangzhou initiated a rural tourism revitalization project. To discover the potential of rural public art in enhancing tourism, the Tonglu County government and the China Academy of Art partnered to commission a team of prestigious public artists to create and place 12 public artworks in Meirong Village. All of these artworks are situated in rice paddies or small public spaces. Most of these public artworks utilised the local

architectural materials, e.g., bamboo, wood, straws. The majority of these artworks also applied the form that mimic symbols of the local cultural and architectural elements, e.g., the bamboo-made musical instrument (1–1), a child rolling traditional iron hoop (1–2), wavy roof of the rural architecture (1–4), the silhouette of local farmers (1–5), ancient-style calligraphies exhibited in the bamboo grove (1–6 and 1–12), a traditional Chinese steelyard (1–7), hills surround the village (1–9 and 1–11). Also, the Meirong Village's villager committee have arranged the "Landscape Art Season in Meirong", a rural art festival that enticed numerous tourists.

In January 2022, Meirong Village was included in the list of "secondary-level rural tourism villages" in Zhejiang Province. In the same month, Meirong Village's inhabitants commissioned several landscape architects to design and install seven new rural public artworks. It is noteworthy that these artworks present fewer symbols of the local culture or local architecture. Most of them mimic the forms of animals or products in modern life, including the butterflies (2–1), the mushroom (2–2), the uneven paper (2–3), the water-wheel (2–4), the insect (2–5), the rabbit (2–6) and a pair of boots (2–7). Additionally, Meirong Village has installed tourist amenities like public toilets and small cafes in close proximity to the paddy fields. They have also constructed wooden plank walkways with steps and handicap ramps on existing visitor-accessible tour routes in the rice fields. The design of the accessible tour route for tourists remains nearly unchanged from 2020 to 2023.

The geospatial sites of all public artworks in Meirong Village are shown in the 2-D map (Figure 1), whereas the photographs of these public artworks are shown in Figure 2. For clear presentation, the public artworks installed in 2021 are numbered as No. 1–1 to 1–12, whereas those artworks installed in 2022 are numbered as No. 2–1 to 2–7.

2.1.2. Yong'an village

Yong'an Village, geographically situated in Yuhang District, Hangzhou (119.94°E, 30.31°N), is an ancient agrarian settlement with a historical specialization in rice cultivation, rendering paddy agriculture its prevailing and enduring industry. As of 2023, the village's populace totals approximately 3,000 individuals. Remarkably, about 97% of the land area within Yong'an Village is classified as "basic farmland". Since 2020, the village has been officially recognized as a critical region for preserving and cultivating high-standard farmland resources. Notably, the agricultural economy of Yong'an Village has witnessed notable enhancements through strategic interventions, such as branding promotion, adoption of digital management systems, and innovative marketing methodologies. Over the period spanning 2020 to 2023, there has

been a significant increase in the annual per capita income of farmers, escalating from less than RMB 3,500 to RMB 5,500. Concurrently, according to Guo and Hong (2022), the Yuhang District Government disclosed a dramatic rise in the village's collective revenue, jumping from RMB 56,850 to RMB 300,000.

To entice more tourists to engage in tourism activities in rural built environments, the villagers invited some professional public artists to create and install six rural public artworks in the paddy field situated on the eastern side of the village in January 2021. These artworks accurately depict animals and rural artefacts, such as cows (1–1), elephants (1–2), gorillas (1–3), fishes (1–4), granaries (1–5) and decorative walls (1–6). Several tourists have already visited and admired these public artworks. The tourist services in the village were inadequately equipped, causing significant inconvenience to visitors.

In 2022, villagers invited some landscape architects to design six additional public artworks to enhance the tourist infrastructure. These artworks were placed in a rice field located in the western part of the village and are constructed from contemporary materials, including stainless steel (2–1), coloured plastics (2–2), wood (2–3, 2–4, and 2–5) and mirror-finish metal (2–6). The majority of them mimic the forms of traditional artefacts and symbols in rural environments, including the traditional flower shelf (2–1), the windmill (2–2), the traditional catapult-like toy (2–4), the traditional steelyards (2–5) and the ancient arched doorway (2–6). Similar to Meirong Village, Yong'an Village has provided some tourist service infrastructures, such as public toilets, some fields for visitors to experience agriculture, and a small agricultural exhibition hall near the rice fields, and wooden planks have also been built on the existing tourists' accessible routes in the paddy fields.

The sites of all public artworks in Yong'an Village are displayed in a 2-D map (Figure 3), whilst their corresponding photographs taken in-situ by the authors are presented in Figure 4. To ensure clarity, the public artworks that were installed in 2021 are numbered from 1–1 to 1–6, whereas those installed in 2022 are numbered from 2–1 to 2–6. The layout of the tour routes accessible to tourists has remained unchanged from 2020 to 2023.

2.2. Research process

For the empirical investigation, the research uses both objective and subjective approaches. In December 2021 and December 2022, the data for these approaches were collected through field research. Both the subjective data source (i.e. geospatial data of the study areas) and the objective data source (i.e. tourists voting for a comprehensive

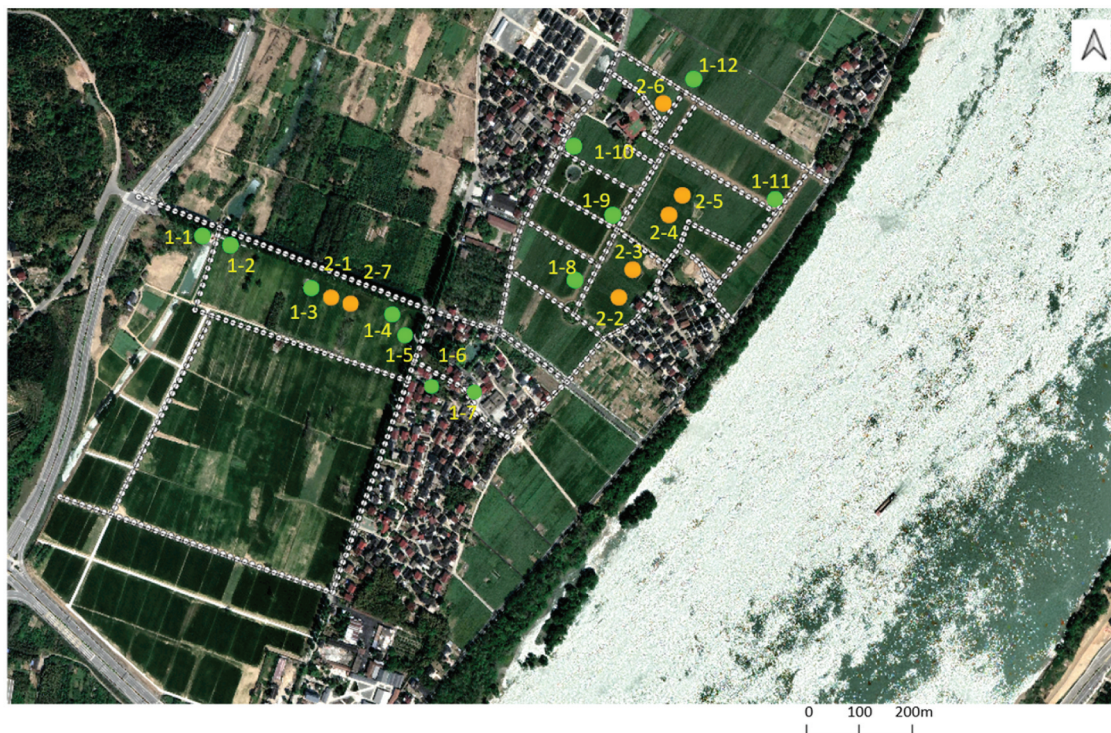


Figure 1. The geospatial sites of all public artworks in Meirong Village.
Source: Zhejiang Geographic Information Public Service Platform, sampled in November 2023.

assessment) are used in this study. The visual exposure rate (VER) of each public artwork as visitors walked along accessible tour routes in two villages in 2021 and 2022 was calculated, using digital landscape information modelling (LIM) techniques. In addition, in both villages in 2021 and 2022, objective ratings from tourists were collected using the Comprehensive Assessment of Artworks and Their Surrounding Environments (CAAS) questionnaire. The AHP model used in this study has a hierarchical structure consisting of two levels. For each decision option, professional experts perform the AHP voting to determine the weight of each bar. To determine the order of merit of each option, importance ranks are calculated. A weighted linear combination (WLC) is then used to calculate the overall CAAS index. The details of these techniques will be presented in a later section. On the basis of these results, a summary of the factors that influence the effectiveness of public art in the development of rural tourism is presented to provide inspiration for the development of the fusion design of sustainable rural tourism.

2.3. Tools and techniques

2.3.1. Processing of the geodata

Through the field survey, it was confirmed that the topography of the study area encompassing two villages did not undergo any significant alteration between 2020 and 2023. The present study employs

the 3D mapping dataset provided by the Zhejiang Geographic Information Public Service Platform (sampled in November 2023). The field research establishes a strong correlation between the current spatial layout of the two villages and the geodata. Processed geodata created an accurate 3-D landscape information model (LIM) using digital parametric GIS software, namely QGIS 3.2 (by Open-Source geospatial Foundation (OSGeo), Bern, Switzerland) and Rhinoceros 7 (by Robert McNeel & Associates, Seattle, WA, USA). The model contains 3D data comprised remote sensing (RS) information and local-scale digital elevation model (DEM) data recording site-specific details (resolution: 1.5 m *1.5 m, geodetic datum: WGS84, sampling time: August 2023). It also indicates the presence of obstructions capable of obstructing tourists' views at 1.5 m or more above the ground plane. The tour routes that are accessible to tourists within the research area, as well as the precise geographic coordinates of the initial collection of public artworks that were installed in 2021 and the subsequent set that will be installed in 2022 have been entered manually into the LIM.

2.3.2. Visual exposure rate

There exists a noteworthy correlation between tourists' geospatial viewshed patterns and their behavioural manifestations in outdoor spaces, as evidenced by Wang (2022). In intricate built environments, however, conventional two-dimensional visual field analysis method might not accurately capture tourists'



Figure 2. The photograph of the public artworks installed in Meirong Village in 2021 and 2022.
Source: Taken by authors.

evolving spatial perception as they traverse predefined tour routes (2023a). Thus, as a geospatial analysis technique, i.e., 3-D Visual Exposure Rate (VER) algorithm has been suggested by researchers in the field of spatial cognition and architectural design (Hosseini, Daneshjoo, and Yeganeh 2022). To quantify the likelihood of tourists observing public artworks in the study areas, the VER calculation was utilised to evaluate the probability of tourists observing certain spatial geo-features when travelling along tour routes. Relevant algorithms for VER have been proposed in the context of geospatial research on local-level built environments (Kim, Kim, and Kim 2019).

The VER levels around each public art site in two villages were automatically calculated by a parametric program based on the LIM of the site. The application was created using Grasshopper (the parametric visual programming platform of Rhinoceros 7) and the UrbanXTool plug-in. The programme requires the specification of input parameters, including the viewer's

perspective and a DEM model of the geomorphological data of the study area. Following the convention of most geomorphological studies conducted in similar scale outdoor spaces (Zhou et al. 2023b), viewpoints are created at a height of 1.5 m above the tourist-accessible tour routes, which was done to represent the tourists' viewing height in the process of VER calculation, while the distance between every two viewpoints is 5 m, which is the correct number of viewpoints for the Grasshopper program to calculate. The 3D isovist of the viewpoints are calculated with a viewshed radius of 15 m, which is consistent with common small-scale studies (Zhou et al. 2023b).

2.3.3. The AHP-based objective CAAS assessment

The hierarchical analysis process (AHP) technique assesses the relative importance of criteria for measuring each objective's attainability (Saaty 1995). To compile the "comprehensive assessment of the artwork and their surrounding environments" (CAAS), an AHP-based hierarchical structural model was employed to



Figure 3. The geospatial sites of all public artworks in Yong'an village.
Source: Zhejiang Geographic Information Public Service Platform, sampled in November 2023.

construct a hierarchy comprising objective, criterion, and indicator layers, as listed in Table 1. The applicability of homogeneous structural models in the post-completion evaluation of landscape architecture design in built environments has been demonstrated in related studies (Huang et al. 2023; Li et al. 2022).

To determine the weight values for each indicator, we created a judgement matrix using the Analytic Hierarchy Process (AHP) method, proposed by the mathematical statistician T.L. Saaty. This method uses Saaty's 1-to-9 point scale for pairwise comparisons of the importance of different indicators. The method quantifies the relative importance of each indicator using five primary intensity levels

(1 = equally important, 3 = moderately important, 5 = vital, 7 = very important, 9 = extremely important) and 4 intermediate levels (2 = weak, 4 = moderate+, 6 = strong+, 8 = extremely strong); the most promising level of each factor was given the greatest weight, and vice versa (Saaty 2008). The research team invited six professionals with backgrounds in the disciplines of environmental design, landscape architecture, rural planning, public art, rural geography, and tourism management, respectively, to complete the expert questionnaire. This numbers of experts are suitable for local-landscape-related AHP assessment (Li et al. 2022). Each expert had over 5 years of experience in rural research and practice.

Table 1. The hierarchical structural model for CAAS.

Goal layer	Criterion layer	First-level indicator layer
Comprehensive assessment of the artworks and their surrounding environments (Goal)	Value factors of tourists' willingness (B1)	Willingness of tourists to come back to visit again (C1)
		Willingness of tourists to stay in the surroundings of the public artworks (C2)
	Value factors of cultural and aesthetics (B2)	The identifiability of form of public artworks (C3)
		The aesthetics of colour of public artworks (C4)
		The aesthetics of form of public artworks (C5)
		Abundance of vegetations around public artworks (C6)
		Adequacy of tourism facilities around public artworks (C7)
		Visual aesthetics value of the public artwork and the surrounding landscape (C8)
	Value factors of tourism management (B3)	Condition of accessibility around public artworks (C9)
		Compatibility between the scene surrounding public artworks and the rural landscape (C10)
		Environmental hygienic condition (C11)
		Maintenance status of tourism facilities (C12)
		Safety condition (C13)

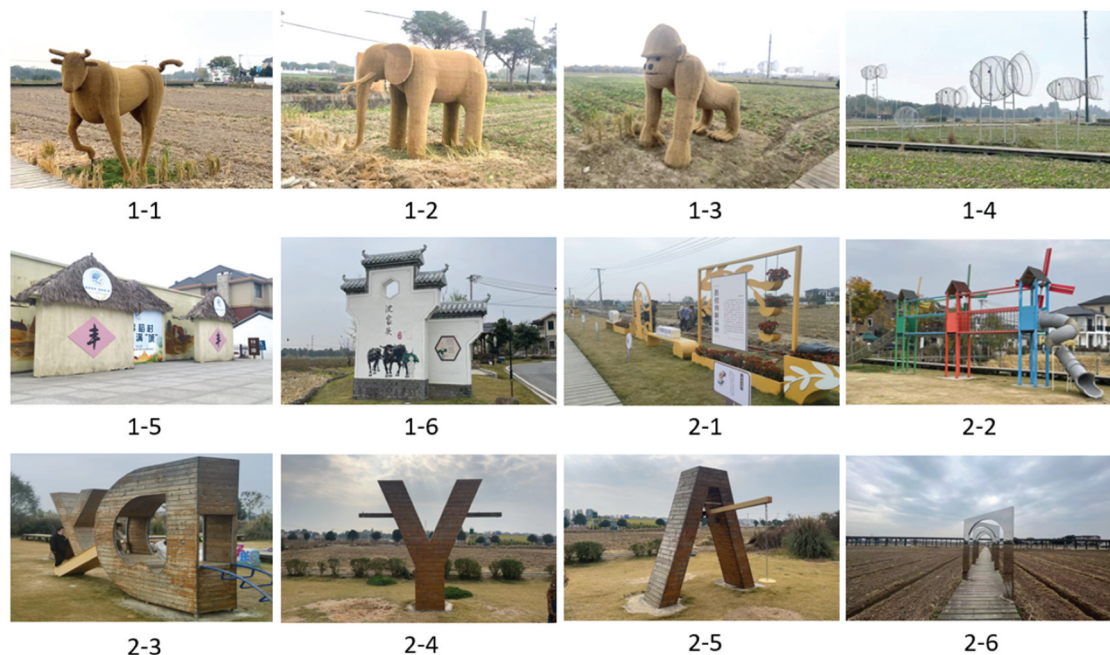


Figure 4. The photograph of the public artworks installed in Yong'an village in 2021 and 2022.
Source: Taken by authors.

The weight of each indicator was assessed separately, and the judgment matrix ratio was calculated to obtain the judgment matrix of each criterion level factor on the indicator level.

The research team invited tourists who had visited two villages after the installation of the first batch of public artwork in 2021 and the second batch in 2022, respectively. The participants were instructed to assess the artworks and surrounding environments based on a 1–9 scale for each indicator item. Their evaluations were solely based on their subjective experiences during their visits to the villages in 2021 and 2022, respectively. All participants have paid their visits to all sites of the public artworks. Prior to participation, all participants provided verbal informed consent. Based on the weights of the factors determined in the AHP method, the weighted linear combination (WLC) method was used to perform matrix operations (Yang et al. 2022) to calculate the mean scores of each criterion (B1, B2, B3) for the comprehensive evaluation of artworks and surroundings, as well as the weighted total mean score, which will be described in detail later.

3. Results

3.1. Visual exposure rate calculations

The visual qualities of the surrounding environments of each public artwork in Meirong Village were computed. Detailed configuration settings for the VER algorithm can be found in section 2.3.2. To conform with the data format requisites of the parametric analysis programme within the Grasshopper, the geographic characteristics of the study area underwent transformation into a mesh grid surface. The VERs

along tour routes of tourists in both villages are displayed using Rhinoceros software through visualisation in pseudo-colour (Figures 5 and Figure 6).

Higher VER values indicate that public artworks and their surrounding environments are more likely to be viewed by visitors travelling along accessible routes. The VERs around the public artworks installed in 2021 and the new public artworks newly installed in 2022 were calculated, respectively. The VER values at the surroundings of each public artworks in Meirong Village and Yong'an Village are shown in Figures 7 and Figure 8, respectively.

In Meirong Village, the locations of the public artworks installed in 2022 had lower verification redemption values than the public artworks from 2021. The mean VER of the 12 public artworks designed and installed in 2021 is 1532.583 ± 165.091 . In comparison, the mean VER of the seven newly installed public artworks installed in 2022 is 1401.286 ± 112.107 . The overall mean VER of all 19 public artworks is 1484.211 ± 158.365 .

It was observed that the public artworks installed in Yong'an Village in 2022 have similar-level VERs as those installed in 2021. The VER for the 12 public artworks that were installed in 2021 amounts to 1533.833 ± 43.778 , whereas the mean VER value for the six novel public artworks in 2022 is 1407.351 ± 39.420 . The average VER of all public artworks is 1502.25 ± 52.275 . The causes of these phenomena will be discussed later.

3.2. The scoring of CAAS

3.2.1. AHP-based CAAS weight calculation for expert investigation

The AHP-based assessments have been adapted in many studies on local-scale landscape, e.g., evaluating

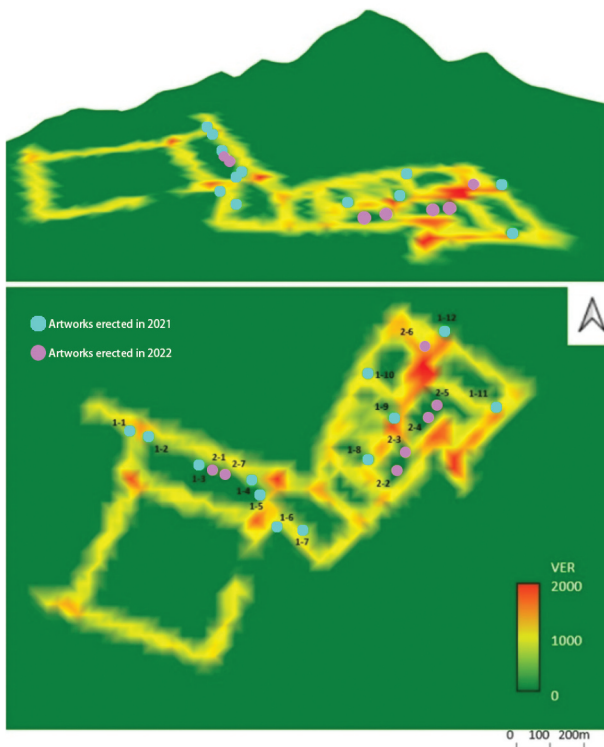


Figure 5. The geospatial distribution of VERs along visitors' tour routes in Meirong Village.
Source: Drawn by authors.

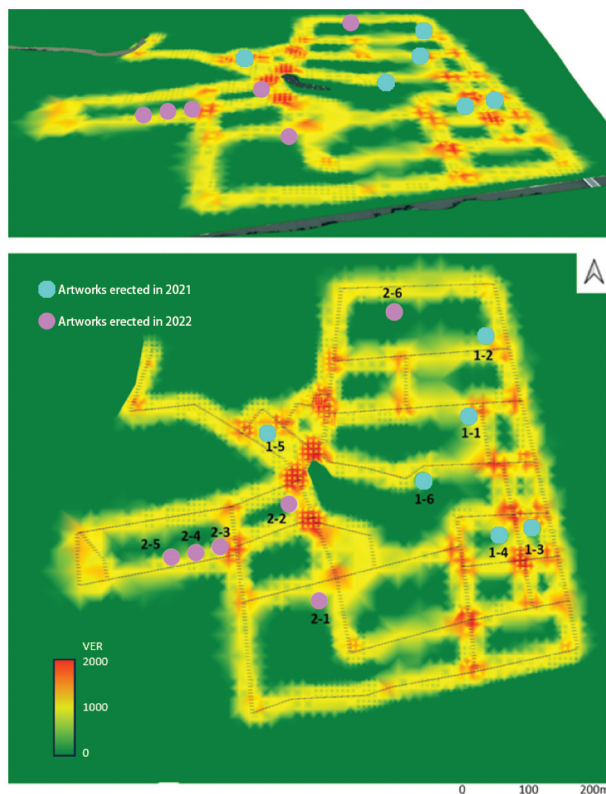


Figure 6. The geospatial distribution of VERs along visitors' tour routes in Yong'an village.
Source: Drawn by authors.

geo-sites and villages for conservation (Long, Wang, and Lin 2023), heritage protection (Tessema et al. 2021) and ecological tourism (Jia et al. 2022).

Table 2. A-Bi pairwise comparative matrices.

A	B1	B2	B3	W
B1	1	3/2	3	0.5064
B2	2/3	1	3/2	0.3073
B3	1/3	2/3	1	0.1863

CR = 0.0089 < 1; $\lambda_{\max}$ = 3.0090.

Table 3. B1-ci pairwise comparative matrices.

B1	C1	C2	W
C1	1	3/2	0.6
C2	2/3	1	0.4

Second-order matrices, no test is required.

However, they have not considered specific factors related to public artworks. The validity of the AHP model utilised in landscape-relevant study has been verified in existed homogeneous research (Huang et al. 2023). A statistic Python programme developed with "Scikit-learn" and "Matplotlib" packages was used for ranking criteria and sub-criteria. The most potent factors are given the most significant weight at each level, and vice versa. The arithmetic average method was used to assign values to the expert scores, evaluate the weight of each indicator, respectively, and obtain the pairwise comparative matrices of each criterion on the indicator layer (Tables 2, 3, 4 and 5).

To verify the validity of this model, a Python program was prepared to further validate the consistency ratio CR of W_i and all the self-factors in the expert questionnaire. We further calculated the CR values of each pairwise comparative matrix, and the results showed that there is sufficient consistency (CR < 0.05) in the relative weights of each factor (Kosmala and Beall 2019). The normalised weight matrix for each criterion includes the weights of the main factor layer (W_{Bi}) and the weights of each first-level factor layer (W_{Ci}), and the weight coefficients of each indicator in the CAAS are finally obtained (Table 6).

3.2.2. Collecting the tourists' voting data

Within the scope of this study, CAAS voting was systematically executed through face-to-face interactions with tourists immediately upon the conclusion of their visits. Regarding Meirong Village, our research team gathered 93 on-site questionnaires in 2021, out of which 90 were deemed valid, comprising 43 male and 47 female respondents. In the following year, 2022, a total of 96 questionnaires were collected from tourists *in situ*, with 90 being valid responses, featuring 48 males and 42 females. For Yong'an Village, we amassed a total of 92 questionnaires directly from tourists in 2021, with all 90 of them meeting validity criteria and reflecting gender parity, i.e., 45 male and 45 female participants. Moving onto 2022, our survey garnered 91 in-situ questionnaires, again with 90 valid entries, consisting of 48 male and 42 female contributors. This consistent methodological approach ensured a robust dataset for analysing CAAS in relation to

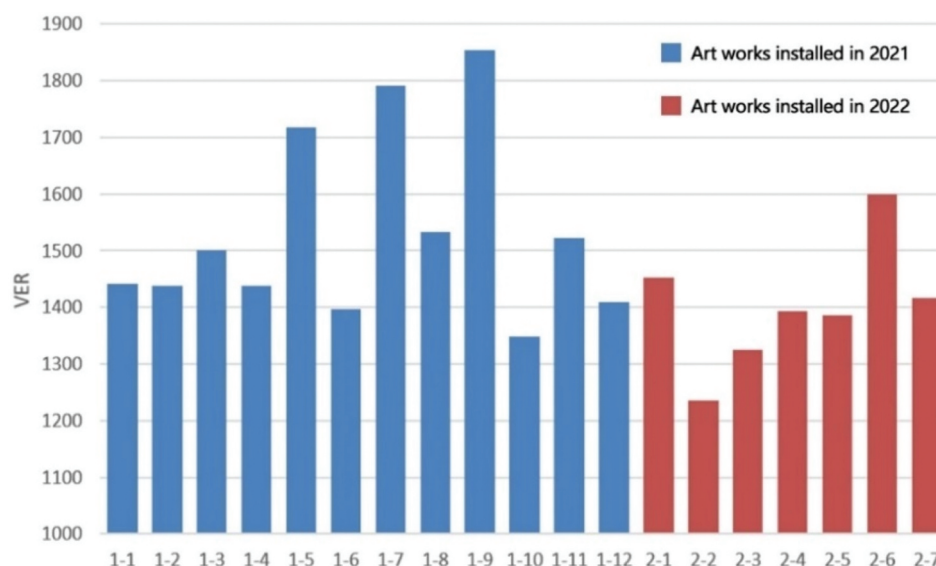


Figure 7. The VER values at the surroundings of each public artworks in Meirong Village.
Source: Drawn by authors.

public artworks across both villages over the two-year period under investigation.

In order to verify the accuracy and usefulness of the questionnaire, the validity was further verified by using KMO and Bartlett's test. As for all valid data in Meirong Village, the KMO value is 0.908 (>0.8) and can pass the Bartlett's test (approximate chi-square = 1956.328, $p = 0.001 < 0.05$). As for all valid data in Yong'an Village, the KMO value is 0.945 (>0.8) and can pass the Bartlett's test (approximate chi-square = 1818.122, $p = 0.000 < 0.05$). Consequently, the data obtained via questionnaires from both villages can be utilized to extract information with high validity.

3.2.3. The results of the CAAS voting by tourists in two villages

Based on their voting results of valid questionnaires, the mean scores and standard deviation (mean $\pm$ standard deviation) values of the evaluation of each indicator level 1 factor in 2021 and 2022 in both villages were calculated, respectively, and the results are shown in Figures 9 and Figure 10, respectively.

In Meirong Village, tourists gave higher ratings to most factors in 2021. However, the adequacy of tourism facilities around public artworks (C7) received a score of 4.77 and the condition of accessibility

Table 5. B3-ci pairwise comparative matrices.

B3	C11	C12	C13	W
C11	1	1/2	2	0.2857
C12	2	1	4	0.5714
C13	1/2	1/4	1	0.2825

CR = 0.0000 < 1; $\lambda_{\max} = 3.0000$.

around public artworks (C9) scored 4.81, both falling below 5.0. All other indicator level 1 factor scores were above 5.0. However, most of the factors scored lower in 2022 compared to 2021, with the majority of factors scoring below 5.0. Notably, the scores of the hygienic condition and the tourism maintenance condition indicated a strong negative tendency among tourists towards managing and maintaining public artworks and their surroundings. Only three factors scored higher in 2022 compared to 2021, i.e., the adequacy of tourism facilities around public artworks (C7) (mean score of 4.77 in 2021 and 5.71 in 2022), the accessibility around public artworks (C9) (mean score of 4.81 in 2021 and 5.12 in 2022), and the safety condition (C13) (mean score of 7.22 in 2021 and 7.52 in 2022).

As for Yong'an Village, it is noteworthy that most factors are rated lower than 4.0 in 2021, whereas most factors are rated higher than 6.0 in 2022. The data indicates that the majority of tourist held the view that there was a significant improvement in the public artworks and the surrounding environments in 2022, as opposed to 2021. It is noticed that multiple factors

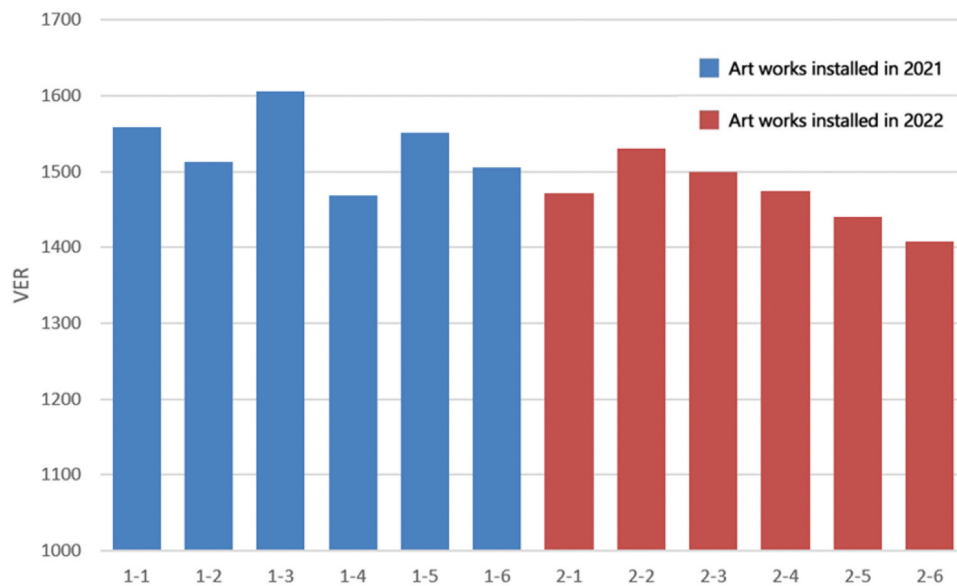
Table 4. B2-ci pairwise comparative matrices.

B2	C3	C4	C5	C6	C7	C8	C9	C10	W
C3	1	3/2	3/2	2	3	3/2	4	1/2	0.1546
C4	2/3	1	1	1/2	2	1	3	2	0.1402
C5	2/3	1	1	1/2	2	1	3	1/3	0.0952
C6	1/2	2	2	1	3/2	1/2	2	1/4	0.1090
C7	1/3	1/2	1/2	2/3	1	1/4	3/2	1/6	0.0489
C8	2/3	1	1	2	4	1	6	1/4	0.1353
C9	1/4	1/3	1/3	1/2	2/3	1/6	1	1/8	0.0342
C10	2	1/2	3	4	6	4	8	1	0.2825

CR = 0.0754 < 1; $\lambda_{\max} = 8.7442$.

Table 6. Weights of each criterion for the CAAS calculated by the AHP model.

Criterion layer (B_i)	Weights of W_{B_i}	First-level indicator layer (C_i)	Weights of C_i at B_i	The overall Weights of C_i (W_{C_i})
B1	0.5064	C1	0.6	0.3038
		C2	0.4	0.2026
B2	0.3073	C3	0.1546	0.0475
		C4	0.1402	0.0431
		C5	0.0952	0.0293
		C6	0.1090	0.0335
		C7	0.0489	0.0150
		C8	0.1353	0.0416
		C9	0.0342	0.0105
		C10	0.2825	0.0868
B3	0.1863	C11	0.2857	0.0532
		C12	0.5714	0.1065
		C13	0.1429	0.0266

**Figure 8.** The VER values at the surroundings of each public artworks in Yong'an Village.

Source: Drawn by authors.

have been explicitly improved in 2022, includes implementing more tourism facilities (C7), improving visual aesthetic value of the public artwork and the surrounding landscape (C8), increasing the accessibility around public artworks by constructing wooden planks along the tour route (C9). Also, compatibility between the scene surrounding the public artworks and the rural landscape (C10) is emphasized.

Further, based on the weights of the factors determined in the AHP method, the weighted linear combination (WLC) method was used to calculate the mean scores of each criterion on the Criterion layer (B1, B2, and B3) and the mean of the overall CAAS score, and the results are detailed in Figures 11 and Figure 12.

Using the Python software and relevant packages, i.e., Matplotlib and Pandas, a statistical analysis programme was developed to figure out whether there would be differences between 2021 and 2022 in two villages. The ANOVA tests were employed to examine the variability of various questionnaires in 2021 and 2022 in both villages with regard to the four factors, i.e., B1, B2, B3 and the overall CAAS scores. The results are presented in the Tables 7 and 8. It

indicates that significant differences ($p < 0.05$) were observed in the B1, B2, B3 and overall CAAS scores across samples in both villages of varying years.

As for Meirong Village, it was found that the mean scores of all the criterion in 2021 were above 6.0 and the satisfaction of tourists with the public artworks and their surrounding environments was relatively high (the overall CAAS score is 6.640 ± 0.548). The factors of tourism management (B3) have a higher score than the factors of tourists' willingness (B1), and the overall CAAS score is 6.640 ± 0.548 . The factors of cultural and aesthetic value (B2) scored relatively low. However, in 2022, the mean scores for each criterion are below 5.0, and the overall CAAS score declines significantly from 2021, with only the factors of cultural and aesthetic value (B2) scoring relatively higher. Also, the factors of tourists' willingness (B1) scored lower, while tourists' willingness of tourists to come back to visit again (C1) and stay in the surroundings of the public artworks (C2) were both lower. Factors of tourism management (B3) scored the lowest, with tourists' willingness of tourists to come back to visit again (C11) and stay in the surroundings of the public artworks (C2). Most tourist showed their significant

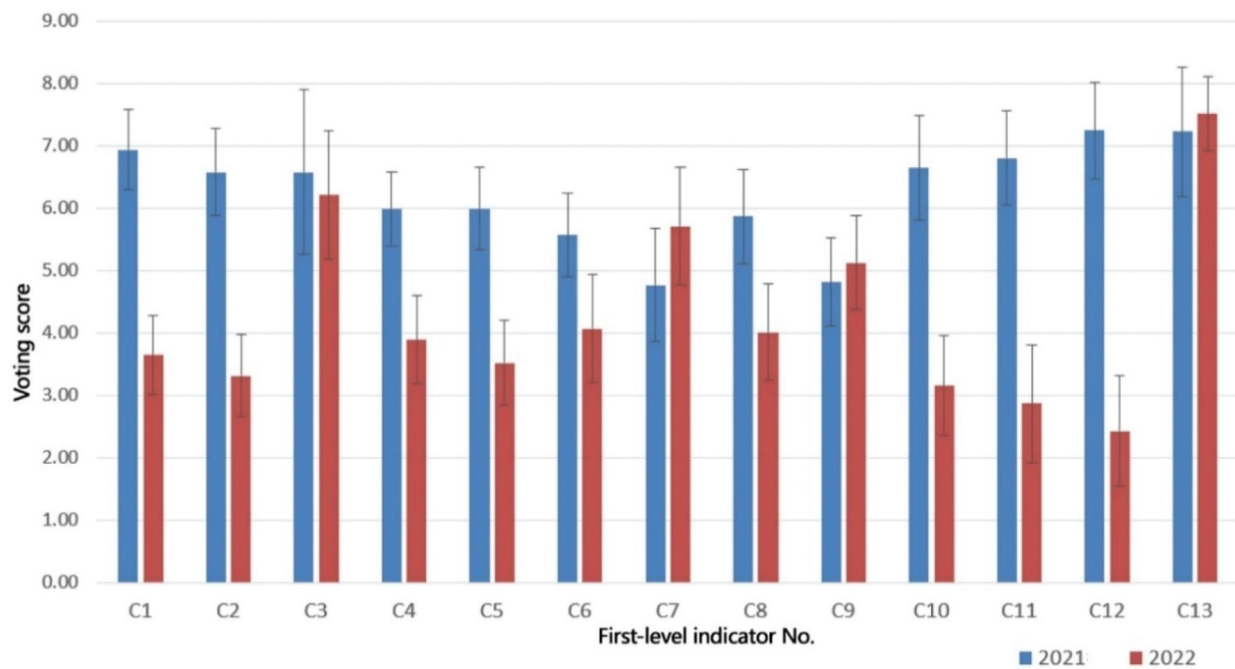


Figure 9. The results of the CAAS voting for each criteria at the first-level indicator layer from Meirong Village.

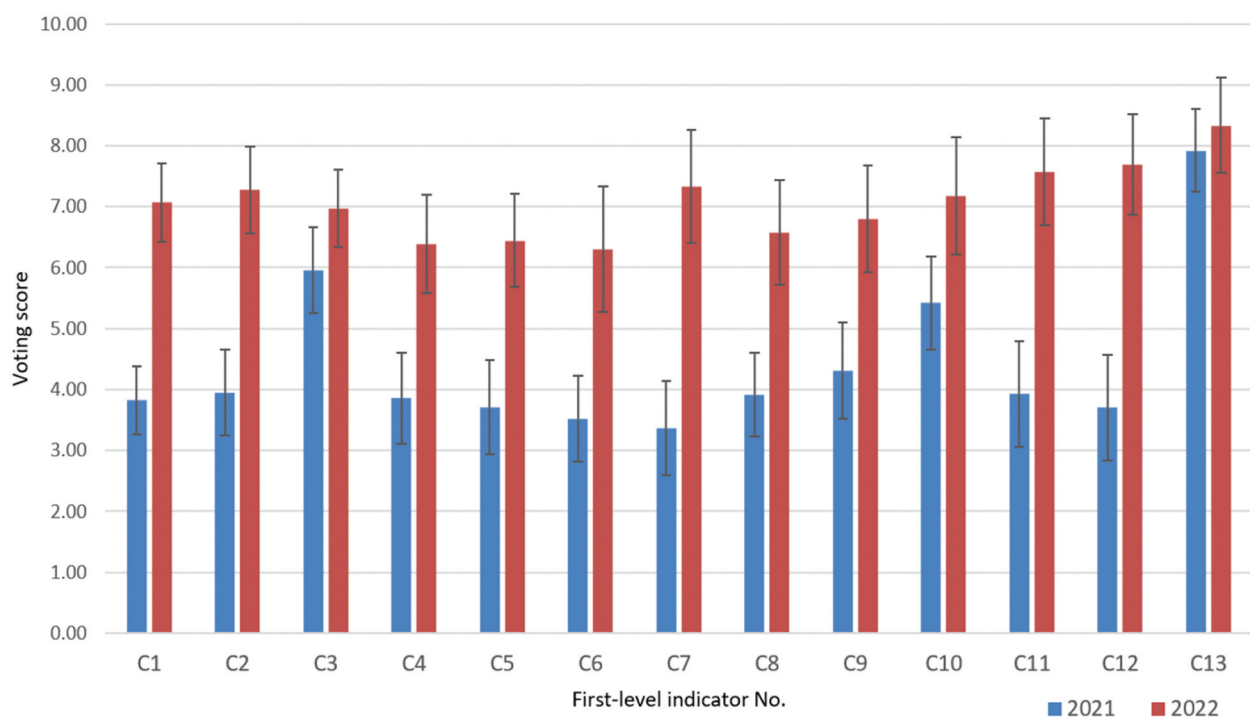


Figure 10. The results of the CAAS voting for each criteria at the first-level indicator layer from Yong'an village.

dissatisfaction with the tourism facility and service. As for Yong'an Village, it is noticed that the mean scores of all the criterion in 2022 have increased explicitly, compared with those in 2021. The overall CAAS reaches 7.15 ± 0.80 in 2022 than 2021 (4.21 ± 0.90).

4. Discussion

Public artworks and their contextual integration constitute a critical component in achieving high-quality

rural art infrastructure development, necessitating meticulous consideration within the framework of enhancing the value-chain dynamics. Our analysis posits the importance of focusing on optimizing the "rural value chain" and deploying the fusion design methodology in rural tourism ventures across both Meirong and Yong'an Villages.

The findings reveal that the VERs for the positioning of each public artwork in the two villages were disparate between 2021 and 2022, and their CAAS ratings

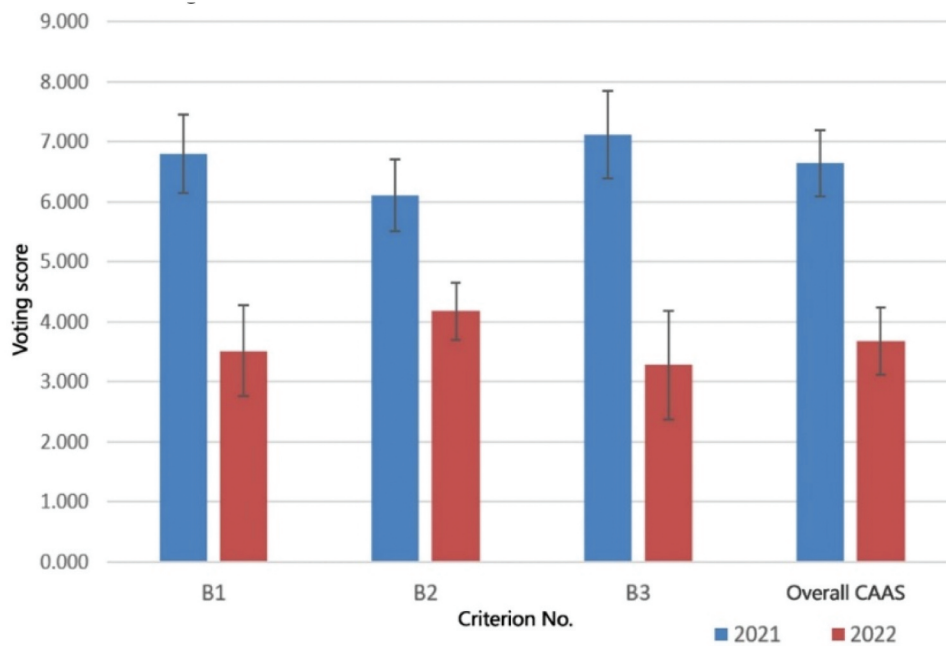


Figure 11. The mean scores of B1, B2, B3 and the overall CAAS score in Meirong Village.

Table 7. ANOVA test results of valid questionnaires from Meirong Village.

Score	Year (Mean ± Std. Deviation)		F	p
	2021	2022		
B1	6.79 ± 1.06	3.51 ± 1.21	373.113	0.000**
B2	6.10 ± 0.96	4.17 ± 0.76	222.099	0.000**
B3	7.11 ± 1.17	3.28 ± 1.47	375.689	0.000**
Overall CAAS	6.64 ± 0.89	3.67 ± 0.91	491.076	0.000**

** $p < 0.01$.

Table 8. ANOVA test results of valid questionnaires from Yong'an village.

	Year (Mean ± Std. Deviation)		F	p
	2021 (n = 90)	2022 (n = 90)		
B1	3.91 ± 1.08	7.15 ± 0.87	491.602	0.000**
B2	4.59 ± 0.89	6.78 ± 0.89	273.534	0.000**
B3	4.41 ± 1.43	7.76 ± 1.16	299.451	0.000**
Overall CAAS	4.21 ± 0.90	7.15 ± 0.80	536.991	0.000**

** $p < 0.01$.

also differed. Overall, between 2021 and 2022, in the rural art construction of the two villages, the efficacy of public artworks in Meirong Village deteriorated, while the variation trend in Yong'an Village was the opposite. It is highlighted that three hypotheses put forward in end of the introduction have been verified. Relevant detailed discussions are described as follows.

4.1. The influential factor of the spatial layout characteristics

The study analyses the spatial layout characteristics of public artworks and assesses the likelihood of tourists observing these artworks based on comparative VER calculations. The results indicate a decrease in VERs near the seven newly installed public artworks at Meirong Village. However, the

installation of the six new public artworks at Yong'an Village did not significantly affect the overall VERs near each artwork. In Meirong Village, seven new public artworks were installed in 2022. However, these artworks are relatively inconspicuous and not easily noticed by tourists as they move along the route. In contrast, the public artworks installed in 2021, specifically No. 1–7 (VER = 1791) and 1–9 (VER = 1855), were located at major intersections or in small squares. As a result, tourists had a more focused field of view when viewing them, resulting in higher VER values for their surrounding spaces. In 2022, two public artworks, No. 2–2 (VER = 1236) and No. 2–3 (VER = 1325), were implemented in the centre of paddy fields, away from the tourists' accessible tour route. As a result, tourists

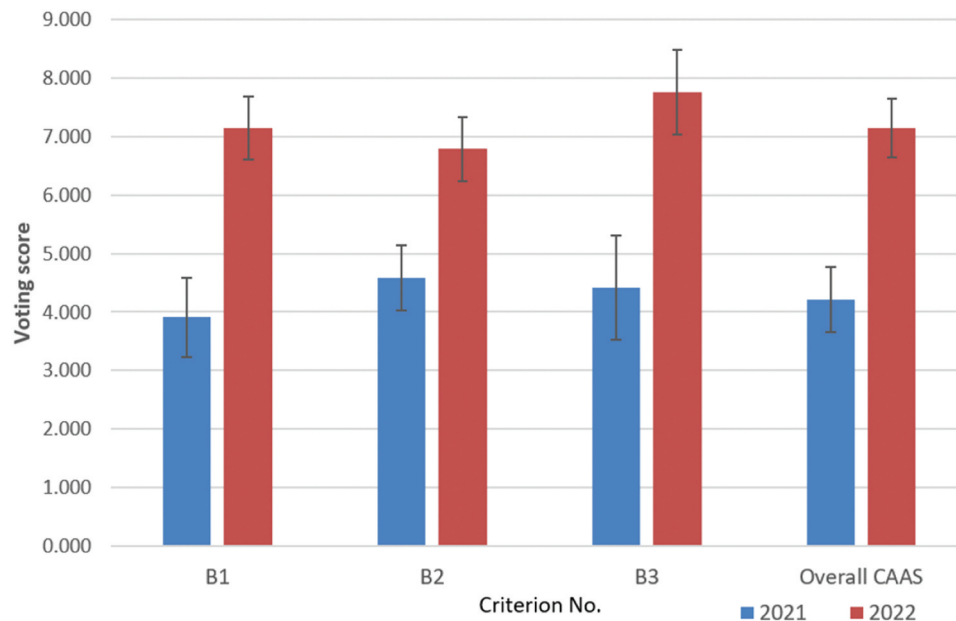


Figure 12. The mean scores of B1, B2, B3 and the overall CAAS score in Yong'an village.

are unable to view them up close, resulting in the lowest VER values for their peripheral locations. In Yong'an Village, six new public artworks were installed in 2022, with slightly lower mean VERs (1407.351 ± 39.420) compared to 2021 (1533.833 ± 43.778). Public artworks have VERs ranging from 1400 to 1600. Among the three artworks installed in 2022, the relatively lowest VERs were recorded.

Based on our empirical data, it appears that there is no positive correlation between the quantity of artworks and tourists' visual perception of both the artworks and their surroundings. Consequently, the placement of public artworks and tourist routes has a significant impact on tourists' visual experience, which subsequently influences their subjective evaluation of the built environment. Artworks are more likely to attract significant visual attention when they are strategically located along accessible tourist routes, in close proximity to each other, and harmoniously integrated into their surroundings. Similar findings have been reported in studies of rural landscape planning (Hidayat, Baiquni, and Kurniawan 2023). Public spaces often serve as platforms for tourists to engage in cultural and tourism activities. Tourists' visual perception and the flow of visitors in public spaces are crucial factors in assessing their attractiveness and the quality of their design (H. Zhou and Wang 2023). It is advisable not to focus solely on the quantity of artworks when planning and designing rural public artworks. Instead, to promote sustainable spatial development, equal attention should be paid to the distribution of artworks and the design of public spaces. Tourists' overall visual perception of both the artworks and their surroundings will be enhanced by this fusion-design-driven approach.

4.2. The influential factor of cultural and aesthetics value

In Meirong Village, a notable observation was made concerning the 2022 public art installations, which predominantly employed visual motifs of animals or urban artifacts, demonstrating a paucity of deep-rooted connections to the indigenous village culture. This shortcoming notably diminished the CAAS. While tourists were easier to recognise artworks installed during both 2021 and 2022, those installed in Meirong Village in the latter year were perceived as culturally less substantial. Concurrently, instances emerged where interaction with specific artworks (such as No. 2-2, 2-3, and 2-5 in Yong'an Village) led to enhanced visitor dwell time near these pieces. Analogous findings were reported in an empirical study examining rural tourism development driven by public art in another Chinese tourism village (Zhang 2022).

The seamless integration of local cultural elements represents a fundamental determinant in attracting tourists to rural villages. Significantly, in 2021, public artworks in Meirong Village were predominantly executed by esteemed artists sourced from premier Chinese art institutions, while in 2022, landscape architects took on a central role in the conceptualization and implementation of public art projects – a transition that implies a potential disparity between the professional perspectives of creatives and the authentic cultural fabric of the village, thereby posing a challenge in formulating a sustainable tourism strategy with enduring impact.

Moreover, it was observed that the majority of the artworks introduced in Yong'an Village during 2021 inadequately encapsulated the culturally emblematic

symbols intrinsic to the village setting. In contrast, the six installations commissioned in 2022 more effectively portrayed traditional and locally resonant cultural motifs. It is imperative to recognize that fluctuations in decision-makers, stakeholders, and tourist demographics can significantly affect the success of rural tourism rejuvenation efforts, influenced by multifaceted environmental and psychological dynamics.

Research in design psychology underscores this issue, revealing a distinction between the creative intentions of artists and designers for public artworks and the public's perception and interpretation, which Pelowski et al. (2016) attribute to the phenomenon of emotional sharing. Subsequently, studies have shown that effective emotional sharing positively correlates with the perceiver's subjective appreciation of the artworks (Pelowski et al. 2020). Consequently, incorporating design elements and symbols that mirror the rural locale's historical and cultural heritage, along with its unique industries, into public artworks could potentially bolster emotional bonds among public artists, environmental designers, and tourists, thereby enhancing the overall experience and sustenance of rural tourism initiatives.

4.3. The influential factor of tourism management

In rural art construction, cultural and tourism operation and maintenance of the site are crucial. Despite a significant decline in tourists' overall CASS assessment of Meirong Village's public artworks and their surrounding landscape in 2022 as compared to 2021, the adequacy of tourism facilities and safety conditions in the two villages have improved to some extent in 2022. Meanwhile, the tourists' perceptions of the improvements of tourism amenities and safety conditions in both villages have improved in 2022. Nonetheless, the objective CAAS assessment of the public artworks and landscape in Yong'an Village ranks significantly higher. It is possible to elucidate these phenomena as follows.

Rural communities may struggle to achieve sustainable development with limited community involvement and inadequate tourism infrastructure in the existed rural built environments (Shani and Pizam 2012). In 2022, it was noted that both villages introduced additional service facilities near their public artworks, such as cafes, exhibition spaces and public toilets. These measures led to improved sustainable rural tourism amenities and improved the overall CAAS scores voted by tourists. The surrounding sites of the art pieces have been made more accessible by constructing wooden planks with steps and ramps on the original ridge paths across the fields. Some of the sites in both villages have also had safety measures taken, with railings and

handrails added to certain ridges to enhance the safety senses of tourists. Besides, the interaction between public artworks and tourists in Yong'an Village is useful to attract more visitors. The settings of interactive public artworks are indicated to be of high efficacy in attracting tourists for rural environmental design projects (Gao, Li, and Sun 2023).

Furthermore, although the two villages possess abundant resources in ecology and culture, that external traction is not necessary to drive the "endogenous drive" of rural cultural tourism in the process of rural art construction, according to the Theory of Endogenous Growth widely applied in modern economy. Therefore, when managing, operating, and maintaining rural tourism projects, it will be effective to motivate participants with cultural aspirations and strengthen the application of cultural tourism service design, experience design, intelligent technology, information services, and digital operations (Zhu, Li, and Feng 2022). These will be of help to enhance the management of fusion-design-driven rural tourism projects.

4.4. Suggestions for improving sustainable tourism by 'rural value chain' optimisation

Rural public art construction acts as a pivotal "connector" that intertwines a broad array of cultural resources within the rural context with ecological, industrial, service, and related sectors. In striving towards sustainable rural public art development, the enhancement of locality, subjectivity, and participatory elements constitutes a critical domain demanding focused attention and resolution. Observations show that the rural art construction initiative in Meirong Village relies on conventional modalities, largely involving invitation-only artist projects and exhibits a dearth of collaboration with other local cultural or agricultural industries. Such methodologies, however, exhibit inherent constraints, primarily limiting the promotion of genuine culture within tourism endeavours.

According to Shelley-Anne (2022), the "fusion design" approach holds promise in upgrading the rural value chain. Artistic and design professionals should embark on thorough, on-site analyses of the rural village's natural and human geographies, engaging in a multi-tiered, integrated design process. Horizontal and vertical integration of public artworks and their immediate milieu into the conception and progression of the "rural value chain" is vital to fully apprehend the intricate rapport between these artworks and the local cultural identifiers.

For the establishment of a sustainable cultural and industrial exploitation of rural built environments, it is essential to embed local traditional festivities and cultural traits into the creation of rural artworks (Kosmala and Beall 2019). Public artists and designers

are encouraged to integrate both tangible and intangible cultural heritage components into their designs, which may include folklore narratives, nature education, agrarian traditions, and indigenous crafts (Li et al. 2024; Zhu, Li, and Feng 2022). The conceptual design of cultural tourism activities with distinctive rural industrial characteristics within service design can draw inspiration from innovative “fusion design” philosophies and Information and Communication Technology (ICT) applications, as outlined by Tutuba (2023). Reconstructing the cultural heritage of villages and using appropriate promotional marketing methods will effectively enhance the value of rural tourism. This will promote the added value of rural culture and tourism, resulting in higher benefits for the projects. To effectively propel rural art construction, it is imperative to cultivate a culturally branded identity that authentically embodies the local characteristics. This can be achieved by leveraging the village’s tourism development, integrating poverty alleviation strategies, and employing local-value-centric marketing tactics. By doing so, the distinct cultural essence of the village can be prominently displayed and capitalized upon to attract more tourists.

Overall, the fusion design approach has the potential to be transformed into rural artistic construction activities with an extended “value chain” (Idris and Purnomo 2021; Méndez-Zambrano et al. 2023), enhancing industrial brand value and sustainable benefits.

5. Conclusions

The research objectives aim at exploring the determinants impacting the effectiveness of public artworks in Meirong Villages and Yong’an Village, in fostering sustainable rural tourism development. To accomplish this multifaceted aim, a combined subjective-objective methodology was adopted. The study indicates that sustainable tourism can be effectively propelled through meticulously planned rural built environments by refining spatial layouts, leveraging cultural and aesthetic values, and optimizing tourism management strategies to boost tourists’ subjective appraisals. More importantly, the sustenance of rural tourism transcends merely the quantity of public artworks; rather, it necessitates a holistic fusion-design approach that consolidates sustainable rural tourism industry practices and service designs. The outcomes hold significant implications for practitioners, including public artists, designers, landscape architects, tourism geographers, and tourism managers engaged in rural art construction within analogous built environments. By capitalizing on these findings, they can refine their practices and bolster sustainable rural tourism progression through judiciously designed built environments that integrate efficacious fusion design principles.

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Author contributions

Conceptualisation, X. Z. and T. L.; methodology, T. L.; software, T. L.; resources, X. Z. and C.S.; writing – original draft preparation, T. L.; writing – review and editing, X. Z., C. S. and T. L.; visualisation, T. L. All authors have read and agreed to the published version of the manuscript.

Data availability statement

All relevant data are included in the paper.

References

- Alfathani, F., and A. Nurdini. 2022. “Space Syntax Analysis on Sundanese Traditional Villages (Case Studies: Kampung Naga, Kampung Ciptagelar, and Kampung Dukuh).” *IOP Conference Series: Earth and Environmental Science*, 1058, 012024. <https://doi.org/10.1088/1755-1315/1058/1/012024>.
- Bhattacharjee, M., and S. Saibaba. 2018. “Disruptive Value Creation in Business: A Case Based Analytical Study to Understand the Potential Impact of Disruptive Value on Competitive Forces.” *Management Today* 8 (3): 247. <https://doi.org/10.11127/gmt.2018.09.05>.
- Chen, C., Y. She, Q. Chen, and S. Liu. 2023. “Study on Ecological Adaptability of Traditional Village Construction in Hainan Volcanic Areas.” *Journal of Asian Architecture and Building Engineering* 2023 22 (2): 494–512. <https://doi.org/10.1080/13467581.2022.2046594>.

- Cheung, M., N. Smith, and O. Craven. 2022. "The Impacts of Public Art on Cities, Places and people's Lives." *The Journal of Arts Management, Law, and Society* 52 (1): 37–50. <https://doi.org/10.1080/10632921.2021.1942361>.
- Ding, J., Z. Gao, and S. Ma. 2022. "Understanding Social Spaces in Tourist Villages Through Space Syntax Analysis: Cases of Villages in Huizhou, China." *Sustainability* 14 (19): 12376. <https://doi.org/10.3390/su141912376>.
- Durkin, C., E. Hartnett, D. Shohamy, and E. R. Kandel. 2020. "An Objective Evaluation of the beholder's Response to Abstract and Figurative Art Based on Construal Level Theory." *Proceedings of the National Academy of Sciences* 117 (33): 19809–19815. <https://doi.org/10.1073/pnas.2001772117>.
- Gao, X., Z. Li, and X. Sun. 2023. "Relevance Between Tourist Behavior and the Spatial Environment in Huizhou Traditional Villages—A Case Study of Pingshan Village, Yi County, China." *Sustainability* 15 (6): 5016. <https://doi.org/10.3390/su15065016>.
- Gu, H., and S. Lee. 2023. "Using a Phenomenological Lens to Explore Residents' Lived Experiences of a Public Art Project in an Abandoned Mining Village." *Journal of Korea Planning Association* 58:56–77. <https://doi.org/10.17208/jkpa.2023.12.58.7.56>.
- Guinard, P., and A. Margier. 2018. "Art As a New Urban Norm: Between Normalization of the City Through Art and Normalization of Art Through the City in Montreal and Johannesburg." *Cities* 77:13–20. <https://doi.org/10.1016/j.cities.2017.04.018>.
- Guo, H., and S. Hong. 2022. "Energizing Revenue Increase and Grain Production Stabilization with "Five Modernizations synergy": Based on the Case Study of Yong'an Village of Zhejiang Province." *Journal of Administration and Management Institute of Ministry of Agriculture and Rural Affairs (In Chinese)* 13 (2): 1–7.
- Gurney, K. 2018. "Zombie Monument: Public Art and Performing the Present." *Cities* 77:33–38. <https://doi.org/10.1016/j.cities.2017.11.002>.
- Hidayat, W., M. Baiquni, and A. Kurniawan. 2023. "The Development of Sustainable Tourism Destination Area: Spatial Planning in the Tuktuk Siadong Tourist Village, Samosir Regency." *Geosfera Indonesia* 8 (2): 117. <https://doi.org/10.19184/geosi.v8i2.35002>.
- Hosseini, A. A., K. Daneshjoo, and M. Yeganeh. 2022. "New Algorithms for Generating Isovist Field and Isovist Measurements." *Environment & Planning B: Urban Analytics & City Science* 49 (9): 2331–2344. <https://doi.org/10.1177/23998083221083680>.
- Huang, R., and H. Bu. 2022. "Destination Attributes of Memorable Chinese Rural Tourism Experiences: Impact on Positive Arousal, Memory and Behavioral Intention." *Psychology Research and Behavior Management* 15:3639–3661. <https://doi.org/10.2147/PRBM.S387241>.
- Huang, Y., T. Li, Y. Jin, and W. Wu. 2023. "Correlations Among AHP-Based Scenic Beauty Estimation and Water Quality Indicators of Typical Urban Constructed WQT Wetland Park Landscaping." *AQUA - Water Infrastructure, Ecosystems and Society*: 071. <https://doi.org/10.2166/aqua.2023.071>.
- Idris, I., and A. Purnomo. 2021. "Community-Based Tourism: Capability and Community Participation in Tourism Development." In book: *Community Empowerment Through Research, Innovation and Open Access*, edited by B. Sayono. London: Routledge. <https://doi.org/10.1201/9781003189206-26>.
- Jia, H., P. Luo, H. Yang, L. Chuan, H. Li, S. Wu, Y. Cheng, Y. Huang, and W. Xie. 2022. "Exploring the Relationship Between Forest Scenic Beauty with Color Index and Ecological Integrity: Case Study of Jiuzhaigou and Giant Panda National Park in Sichuan, China." *Forests* 13 (11): 1883. <https://doi.org/10.3390/f13111883>.
- Kim, G., A. Kim, and Y. Kim. 2019. "A New 3D Space Syntax Metric Based on 3D Isovist Capture in Urban Space Using Remote Sensing Technology." *Computers, Environment and Urban Systems* 74:74–87. <https://doi.org/10.1016/j.compenvurbsys.2018.11.009>.
- Kosmala, K., and T. S. Beall. 2019. "Problematizing Silences in Intangible Heritage: Unsettling Historical Records of Women in Protests." *International Journal of Heritage Studies* 25 (4): 348–364. <https://doi.org/10.1080/13527258.2017.1422000>.
- Layne, M. K. 2018. "What Environmental Art Can Teach Us About Wind Farms: Exploring the Boundaries of Cultural Aesthetics in Scottish Landscapes." *Landscape Research* 43 (2): 248–259. <https://doi.org/10.1080/01426397.2017.1318118>.
- Li, G., B. Chen, J. Zhu, and L. Sun. 2024. "Traditional Village Research Based on Culture-Landscape Genes: A Case of Tujia Traditional Villages in Shizhu, Chongqing, China." *Journal of Asian Architecture & Building Engineering* 23 (1): 325–343. <https://doi.org/10.1080/13467581.2023.2278880>.
- Li, T., Y. Huang, C. Gu, and F. Qiu. 2022. "Application of Geodesign Techniques for Ecological Engineered Landscaping of Urban River Wetlands: A Case Study of Yuhangtang River." *Sustainability* 14 (23): 15612. <https://doi.org/10.3390/su142315612>.
- Liu, F., B. Lin, and K. Meng. 2023. "Design and Realization of Rural Environment Art Construction of Cultural Image and Visual Communication." *International Journal of Environmental Research and Public Health* 20 (5): 400. <https://doi.org/10.3390/ijerph20054001>.
- Long, K., N. Wang, and Z. Lin. 2023. "Assessing Scenic Beauty of Hilly and Mountain Villages: An Approach Based on Landscape Indicators." *Ecological Indicators* 154:110538. <https://doi.org/10.1016/j.ecolind.2023.110538>.
- Méndez-Zambrano, P. V., L. P. Tierra Pérez, R. E. Ureta Valdez, and Á. P. Flores Orozco. 2023. "Technological Innovations for Agricultural Production from an Environmental Perspective: A Review." *Sustainability* 15 (22): 16100. <https://doi.org/10.3390/su152216100>.
- Meng, Y. 2023. "Research on the Protection and Development of Traditional Villages in Xijie Village, Zhuxian Town, Henan Province in the Context of Rural Tourism." *Advances in Social Science and Culture* 5 (3): 84. <https://doi.org/10.22158/assc.v5n3p84>.
- Moore, E., and B. Quinn. 2023. "Maintaining Connections During the Pandemic: Rural Arts Festivals and Digital Practices." *Tourism and Hospitality* 4 (4): 499–513. <https://doi.org/10.3390/tourhosp4040031>.
- Nugraha, P. 2022. "Spatial Study of Social Facilities Placement in Dense Settlement Using Space Syntax Analysis Case Study: Banjar Bualu, Benoa Village, Bali." *International Journal of Social Science* 2 (2): 1441–1448. <https://doi.org/10.53625/ijss.v2i2.3071>.
- Park, J. H., and Y. S. Lee. 2014. "The Local Revitalization Effects of Public Arts Introduction to Gamcheon Culture Village Regeneration." *Journal of the Korean Housing Association* 2014 25 (5): 33–41. <https://doi.org/10.6107/JKHA.2014.25.5.033>.
- Pelowski, M., P. S. Markey, J. O. Luring, and H. Leder. 2016. "Visualizing the Impact of Art: An Update and Comparison of Current Psychological Models of Art Experience." *Frontiers in Human Neuroscience* 10:160. <https://doi.org/10.3389/fnhum.2016.00160>.

- Pelowski, M., E. Specker, G. Gerger, H. Leder, and L. Weingarden. 2020. "Do You Feel Like I Do? A Study of Spontaneous and Deliberate Emotion Sharing and Understanding Between Artists and Perceivers of Installation Art." *Psychology of Aesthetics, Creativity, and the Arts* 14 (3): 276–293. <https://doi.org/10.1037/aca0000201>.
- Saaty, T. L. 1995. "Transport Planning with Multiple Criteria: The Analytic Hierarchy Process Applications and Progress Review." *Journal of Advanced Transportation* 29 (1): 81–126. <https://doi.org/10.1002/atr.5670290109>.
- Saaty, T. L. 2008. "Decision Making with the Analytic Hierarchy Process." *International Journal of Services Sciences* 1 (1): 83–98. <https://doi.org/10.1504/IJSSCI.2008.017590>.
- Shani, A., and A. Pizam. 2012. "Community Participation in Tourism Planning and Development." In *Handbook of Tourism and Quality-Of-Life Research. International Handbooks of Quality-Of-Life*, edited by M. Uysal, R. Perdue, and M. Sirgy. Dordrecht: Springer. https://doi.org/10.1007/978-94-007-2288-0_32.
- Shelley-Anne, P. 2022. "Is 'Authentic Tourism' a Means of Preserving Living Cultural Heritage?: A Case Study in Old Akko, Israel." *Technical Annals* 1 (1): 252–270. <https://doi.org/10.12681/ta.32104>.
- Suryani, L., N. Ujiant, I. Sugiartha, and I. Wijaya. 2023. "Synergy of Service Village and Custom Village in Management of Tourism Objects in Apuan Village, Susut District, Bangli Regency." *International Journal of Social Science and Human Research* 6 (07): 06. <https://doi.org/10.47191/ijsshr/v6-i7-69>.
- Tessema, G., J. Poesen, G. Verstraeten, A. Van Rompaey, and J. Borg. 2021. "The Scenic Beauty of Geosites and Its Relation to Their Scientific Value and Geoscience Knowledge of Tourists: A Case Study from Southeastern Spain." *Land* 2021 10 (5): 460. <https://doi.org/10.3390/land10050460>.
- Tutuba, N. 2023. "Perspective Chapter: Business Ecosystems – a Structure to Commercialize the Value Chain of Rural Economies in Developing Areas." In book: *Rural Areas - Development and Transformations*, edited by S. van Gasselt. Publisher: IntechOpen. <https://doi.org/10.5772/intechopen.112259>.
- Ubierna, M. 2022. "A Method for the Integration of Public Art in Risk Management Frameworks: Challenges and Opportunities. Libellarium: časopis Za istraživanja U području Informacijskih I Srodnih Znanosti 2022." *Libellarium: časopis za istraživanja u području informacijskih i srodnih znanosti* 13 (1): 61–84. <https://doi.org/10.15291/libellarium.3477>.
- Utami, D. D., W. Dhewanto, and Y. Lestari. 2023. "Rural Tourism Entrepreneurship Success Factors for Sustainable Tourism Village: Evidence from Indonesia." *Cogent Business & Management* 10 (1): 10. <https://doi.org/10.1080/23311975.2023.2180845>.
- Wahyuni, N., I. Astara, and K. Dewi. 2023. "Management Optimization for Strengthening Catur Kintamani Tourism Village." *International Journal of Environmental, Sustainability, and Social Science* 4 (3): 672–679. <https://doi.org/10.38142/ijess.v4i3.541>.
- Wang, Y. 2022. "Research on the Reconstruction of Traditional Culture and Ethics Based on Rural Aesthetics Theory." *Scientific and Social Research* 4 (12): 13–18. <https://doi.org/10.26689/ssr.v4i12.4572>.
- Yang, Y., B. Yu, H. Tai, L. Shen, F. Liu, and S. Wang. 2022. "A Methodology for Weighting Indicators of Value Assessment of Historic Building Using AHP with experts' Priorities." *Journal of Asian Architecture & Building Engineering* 21 (5): 1814–1829. <https://doi.org/10.1080/13467581.2021.1971529>.
- Ying, T., J. Jiang, and Y. Zhou. 2015. "Networks, Citizenship Behaviours and Destination Effectiveness: A Comparative Study of Two Chinese Rural Tourism Destinations." *Journal of Sustainable Tourism* 23 (8–9): 1–23. <https://doi.org/10.1080/09669582.2015.1031672>.
- Zhang, M. 2022. "Study on the Strategy of Rural Revitalization in Ethnic Areas of China." *Journal of Sociology and Ethnology* 11 (4): 103–108. <https://doi.org/10.23977/jsoc.2022.041113>.
- Zheng, X. 2023. "Exploring the Teaching of Rural Tourism Landscape Planning Course in the Context of Rural Revitalization." *Contemporary Education and Teaching Research*. <https://doi.org/10.47852/bonviewCETR2309890503>.
- Zhou, H., and A. Wang. 2023. "Research on the Universal Design of Rural Public Spaces in the Context of an Aging Society." *Advances in Education, Humanities and Social Science Research* 2023b 7 (1): 105. <https://doi.org/10.56028/aehtsr.7.1.105.2023>.
- Zhou, K., W. Wu, X. Dai, and T. Li. 2023a. "Quantitative Estimation of the Internal Spatio-Temporal Characteristics of Ancient Temple Heritage Space with Space Syntax Models: A Case Study of Daming Temple." *Buildings* 13 (5): 1345. <https://doi.org/10.3390/buildings13051345>.
- Zhou, K., W. Wu, T. Li, and X. Dai. 2023b. "Exploring visitors' Visual Perception Along the Spatial Sequence in Temple Heritage Spaces by Quantitative GIS Methods: A Case Study of the Daming Temple, Yangzhou City, China." *Built Heritage* 7 (1): 24. <https://doi.org/10.1186/s43238-023-00105-0>.
- Zhu, X., T. Li, and T. Feng. 2022. "On the Synergy in the Sustainable Development of Cultural Landscape in Traditional Villages Under the Measure of Balanced Development Index: Case Study of the Zhejiang Province." *Sustainability* 14 (18): 11367. <https://doi.org/10.3390/su141811367>.