RESEARCH ON LANDSCAPE EVALUATION AND PLANNING STRATEGIES OF GUANGZHOU SIMIAOMI MODERN AGRICULTURAL INDUSTRIAL PARK UNDER THE BACKGROUND OF INTEGRATION OF AGRICULTURE, CULTURE AND TOURISM

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Abstract. In the context of the era of integrated development of rural revitalization and agriculture, culture, tourism, the landscape planning of modern agricultural industrial parks has become an important carrier for industrial upgrading and spatial reconstruction. Taking Guangzhou Simiaomi Modern Agricultural Industrial Park as the research object, this study comprehensively applied the theoretical methods of landscape evaluation, planning and design to construct a landscape evaluation system for modern agricultural industrial parks, oriented by the integration of agriculture, culture, and tourism. Based on the principles of scientificity, pertinence, and operability, 21 evaluation indicators were selected to establish a comprehensive landscape evaluation model, covering three dimensions: natural landscape, cultural landscape, and production landscape. A complex evaluation model combining the analytic hierarchy process (AHP), semantic difference method (SD), and fuzzy comprehensive evaluation was constructed to clarify the logical relationship between indicators and their quantitative calculation paths. Agricultural landscapes focus on production fields; ornamental plant landscapes highlight decorative vegetation; landscapes integrate natural, cultural, and ecological spatial environments. Through empirical analysis of the case, the current characteristics and existing problems of the industrial park's landscape were revealed, agricultural landscape 0.2263 > ornamental plant landscape 0.1621 > landscape space 0.1598 > experiential activities 0.1325 > agro-processing 0.1051 > agricultural production 0.0976 > park buildings 0.0719 > traffic roads 0.0446. The first-level indicator weights are production landscape > natural landscape > human landscape. The results offer a constructive theoretical framework and practical guidance for evaluating landscapes and improving the planning and design of comparable modern agricultural industrial parks.
Keywords: *semantic differential method, landscape evaluation, agricultural landscape assessment, sustainability, experiential activities*

Introduction

In recent years, the development of modern agricultural industrial parks has become a crucial gateway for advancing the national rural revitalization agenda promoting the implementation of the national rural revitalization strategy, a strategic way to promote supply-side structural reform, and a key measure to improve the quality and efficiency of agricultural development while continuing to boost household agricultural income. These projects have now extended to all provincial-level regions in China. Guangdong, Sichuan, Jiangsu, Shandong, and Heilongjiang provinces ranking among the top five in terms of the number of national-level modern agricultural industrial parks created and recognized, making Guangdong the province with the largest scale of modern agricultural industrial parks (*Table 1*). However, with the rapid construction of modern agricultural industrial parks in recent years, problems such as ecological environmental pollution, homogeneity of agricultural park landscapes, single industrial development

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models, and lack of regional characteristics of the landscape have emerged one after another. Located in Zengcheng District, the Simiaomi Modern Agricultural Industrial Park is Guangzhou's first project to obtain national-level status, making it a suitable and illustrative subject for this study. *Figure 1* illustrating the geographic locations and spatial distribution of modern agricultural landscape parks across China.

Table 1. *Ranking of the number of national-level modern agricultural industrial parks created and recognized in each province (autonomous region, city) from 2017 to 2023*

Ranks	Provinces (autonomous regions, municipalities)	Number of creations	Number of determinations	Ranks	Provinces (autonomous regions, municipalities)	Number of creations	Number of determinations
1	Guangdong	21	14	17	Shaanxi	10	6
2	Sichuan	20	12	18	Liaoning	9	4
3	Jiangsu	16	12	19	Fujian	9	4
4	Shandong	15	10	20	Hubei	9	4
5	Heilongjiang	15	9	21	Guangxi	8	6
6	Henan	12	8	22	Tibet	8	3
7	Xinjiang	13	6	23	Gansu	9	5
8	Hebei	10	4	24	Inner Mongolia	9	4
9	Zhejiang	10	6	25	Hainan	6	3
10	Shanxi	9	5	26	Yunnan	6	4
11	Jilin	9	5	27	Beijing	5	3
12	Anhui	9	5	28	Tianjin	4	2
13	Jiangxi	10	5	29	Qinghai	5	3
14	Hunan	10	6	30	Ningxia	5	3
15	Chongqing	10	5	31	Shanghai	2	2
16	Guizhou	10	6		Total	303	174

Note: China began establishing its first cohort of national-level modern agricultural industrial parks in 2017

Figure 1. *Geographic distribution of national-level modern agricultural industrial parks in China (2017–2023)*

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Review of literature on the integration of agriculture, culture and tourism and rural landscape evaluation

Research on combining agricultural, cultural, and tourism functions has begun to gain traction. Historical concepts like farm tourism, rural tourism, agricultural tourism, and cultural tourism serve as related references that underpin the integrated idea. In contrast, domestic academia has examined the meaning, scope, and characteristics of the agriculture-culture-tourism integration model.

Feng et al. (2019) conducted research on the basis of the intrinsic relationship between agriculture, cultural industry, tourism industry and rural revitalization, industrial integration methods and approaches, and models for promoting rural revitalization, and systematically summarized Shoushan ’s agriculture, culture and tourism. The practical path and experience of integrating to promote rural revitalization creatively refine the two plans, following the Zhejiang model of rural revitalization after the Guizhou model, the Shoushan model, Fuzhou model, Fujian model with exemplary functions were summarized. Yang et al. (2022) noted the integrated development of agriculture, culture, and tourism has stimulated the growth of the homestay economy, expanded study-based travel and educational tourism, and contributed to both industrial renewal and cultural revitalization. Li and Liu (2018) stated that within the context of China’s rural revitalization strategy, the creation of characteristic towns driven by a deep integration of agricultural practices, cultural resources, and tourism functions has become a key force in promoting rural development. His research clarifies the internal links among rural revitalization, the agriculture–culture–tourism integration model, and the high-quality transformation of characteristic towns. Li (2021) believes that under the background of the rural revitalization strategy, the development of characteristic towns with deep integration of “agriculture, culture and tourism” is an important driver of rural development.

Sun et al. (2020) examined the status of agricultural development, cultural industries, and tourism systems, identifying the main mechanisms supporting integration. Their findings highlight progress in infrastructure construction, brand creation, operational models, and promotional strategies, while also pointing the need for more cohesive coordination to strengthen the integration framework. issues, from consumer composition, consumption preferences. Market demand is elaborated from three perspectives of consumption motivation, and a new mechanism for the development of Shexian County “agricultural culture and tourism” with Huizhou characteristics is proposed at the four levels of industrial chain, talents, ancient villages with Huizhou cultural characteristics, and innovation. Chai Zhi (2021) believed that the essential focus of combining agricultural production with cultural and tourism functions and there is an inevitable close connection with agricultural activities and agricultural production to meet the needs of tourists for rest and sightseeing, experience and learning needs. Fu (2021) studied the convergence of agriculture, culture, and tourism reflects a coordinated upgrading process that optimizes and enhances agricultural activities, optimization and upgrading of the agricultural, cultural and tourism industries, and is an innovative reform to achieve the goal of providing premium public services in agriculture, culture, and tourism accessible to all residents.

Wang and Shen (2024), aimed to assess historic urban landscapes’ capacity to provide intangible information services. It applied an ecosystem-service framework and text mining of 1063 ancient poems. The research investigated post-epidemic green space value in dense urban parks, applied Landscape Perception Scale (LPS)-based

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evaluation with surveys, observations, and Analytic Hierarchy Process – Coefficient of Variation (AHP-COV) analysis, verified ecological, health, and economic benefits. Xiang et al. (2022), studied and evaluated post-epidemic green space via LPS, surveys, observations and AHP-COV, confirmed health benefits, but limited sites reduced generalizability. Liu et al. (2025) studied the Agriculture–culture–tourism integration in Wuhan's Huangpi District, applied entropy- Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), coupling coordination and grey analysis with POI data, revealed rising coordination (0.49–0.75) and cultural drivers, but faced static POI and model-assumption limitations. Luo and Liu (2024) examined agriculture–culture–tourism integration in China, applied field theory and CTCCD with provincial panel data (2000–2022) using two-way fixed-effects regression, revealed negative effects on agricultural GDP, TFP, and crop farming, but faced integration-complexity limitations. Guiqin and Huan (2023) examined the rural community–space–building planning supported culture–tourism integration. They reviewed domestic and international cases and constructed a theoretical framework. The results indicated improved spatial governance, architectural style continuity, and integrated cultural–tourism development that aided rural revitalization; Wang and He (2023) investigated improving rural environmental landscape art to meet rising aesthetic demands. They applied a Swin Transformer text encoder and GAN-based visual neural network to generate landscape designs and achieved an FID of 15.23 with evaluation accuracy above 80%. However, testing remained limited to experimental settings, lacking broader real-world validation. Gkoltsiou and Paraskevopoulou (2021) aimed to conserve the historical landscape character of Syggrou Estate by aligning heritage protection with stakeholder needs. It employed landscape character assessment, stakeholder perception surveys, and SWOT analysis to develop management guidelines. The results indicated forests, cultivations, crop conservation, infrastructure restoration, and educational activities as priorities. However, the research was limited by its single-site focus and restricted stakeholder sample, reducing generalizability. Faridah and Pramukanto (2020) created an agro-based landscape plan for the Ciater PTPN VIII tea plantation. It employed preparation, inventory, analysis, and planning stages, analyzing biophysical conditions, tourist attractions, and user preferences. It produced spatial, circulation, and landscape plans. Wang et al. (2024) aimed to evaluate ecological suitability for development in the karst-based Gui'an New Area. It established an index system of ecological elements, significance, and resilience using the Integrated Ecological Resistance model. The results indicated higher suitability in the east and recommended gentle-slope zones; however, limited regional scope and insufficient long-term ecological validation constrained generalization. Hatan et al. (2021) evaluated the aesthetic landscape services of natural and agricultural ecosystems through Israel's agritourism market. It modeled the market as an oligopoly using a structural double-nested logit with GIS and market data. The results estimated welfare losses of US$29,000–53,000/km², but applicability beyond agritourism and regional data remained limited. Yacamán Ochoa et al. (2020) reviewed green infrastructure literature and develop a methodology integrating peri-urban agriculture into GI planning. It applied strategic analysis and methodological design to metropolitan contexts. The findings indicated enhanced landscape connectivity and rural–urban linkages; however, implementation faced data limitations, policy integration challenges, and insufficient practical validation. Based on previous research, this work describes the agriculture–culture–tourism integration model as a process where agricultural activities are culture

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and tourism are oriented by agricultural and rural modernization, breakthrough industrial boundaries and through resource integration, technological penetration, functional correlation, market sharing and other channels, cross-penetrate each other, giving rise to agricultural sightseeing, agricultural leisure vacation, and agricultural cultural experience. Cultural heritage creativity, literary and artistic interpretation and other new business formats, thereby broadening the functions expanding the integration of farming, heritage, and tourism sectors, broadening their value chains, and diversifying the range of related products and experiences and better meeting people's increasingly diversified, refined and personalized consumer needs. In recent years, research on agri-culture-tourism integration has focused on sustainable development and digital empowerment.

In order to address the practical problems and fill the research gap of unclear evaluation standards and weak linkage between agricultural functions, cultural heritage, and tourism activities existing landscape planning of modern agricultural industrial parks, this study takes Guangzhou Simiaomi Modern Agricultural Industrial Park as the empirical carrier. The specific research objectives are: (1) Construct a scientific and operable landscape evaluation system for modern agricultural industrial parks under the background of agri-culture-tourism integration (2) Reveal the current status and key problems of the park's landscape through empirical evaluation (3) Propose targeted strategic planning insights to inform and support the elevated development of similar agricultural parks.

Overview of the development of rural landscape evaluation research

Since the 1960s, nations such as the United Kingdom and the United States have begun examining rural landscapes (Pages and Getz, 1997; Priatmoko et al., 2023). For instance, the United Kingdom established a rural assessment system following the enactment of the “Rural Law” in 1986, emphasizing that evaluating landscapes before designing interventions is an effective approach for their protection. In the 1990s, British landscape scholar Bacon argued that landscape assessments should prioritize conservation value, resource significance, and aesthetic quality, conducted with consideration of spatial coherence. In the United States, natural resource landscape evaluations were developed in 1979 and 1986 (Busby and Rendle, 2000; Yu and Spencer, 2021). In Korea, Sung (2001) evaluated mountain landscapes through ANN and GIS methods. In Germany, Steinhardt (1998) and Jahromi et al. (2022) applied fuzzy logic and hierarchical methods to assess landscape cases (Rasoolimanesh and Seyfi, 2021). Marine (2022) developed a framework for landscape evaluation from three perspectives—visual aspects, integrity, and diversity—and applied it to practical examples (Bajpai et al., 2020). Compared with Western countries, China's rural landscape evaluation research started relatively late. It was not until the 1990s that theoretical research on rural landscape evaluation developed relatively systematically. Rural landscape evaluation involves aesthetics, ecology, humanities and other subject areas, but the research on rural landscape evaluation in China is mainly analyzed from four perspectives: landscape aesthetic quality, landscape ecology, landscape characteristics and comprehensive landscape evaluation (Jahromi and Pourghasemi, 2021; Jahani et al., 2022).

To clarify the differences between agricultural landscape, ornamental plant landscape, and landscape. (1) "Landscape" is a general concept, referring to the comprehensive spatial form composed of natural, artificial, and cultural elements in a

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certain area, including visible scenery and invisible cultural connotations; (2) Agricultural landscape is a subcategory of landscape, specifically referring to the spatial combination formed by agricultural production activities, including farmland, production facilities, and agricultural ecological environments, with both production functions and ecological value (3) Ornamental plant landscape is a component of both natural and cultural landscapes, referring to the landscape form composed of plants with ornamental value, focusing on aesthetic functions and regional cultural expression. The three are inclusive and hierarchical: ornamental plant landscape is a part of agricultural landscape, and agricultural landscape is a type of landscape. Due to the significant differences in rural landscapes across China, the comprehensive evaluation of rural landscapes is a complex systematic project. Therefore, the evaluation of selected landscape areas should determine indicators based on actual conditions, and it is of practical significance to establish a system of rural landscape evaluation that is practical and reliable, has wide application value, and can be reasonably evaluated.

Methods

The Simiaomi Industrial Culture Exhibition Hall serves as a central facility within the Simiaomi modern agricultural industrial park, showcasing the integration of agricultural innovation, culture, and technology. It features historical and thematic exhibits on local agriculture, smart farming technologies, and the park's development. Interactive multimedia zones, including VR/AR experiences, engage visitors and communicate innovation processes.

The hall also includes agri-cultural narrative spaces, visitor service areas, and flexible halls for workshops, lectures, and events, supporting research, education, and tourism. A detailed case study of this facility would examine its operational framework, technological applications, visitor engagement, and contributions to regional agricultural and industrial development.

(https://invest.beijing.gov.cn/english/Procedure/Investment/202509/t20250913_4201238.html)

Landscape evaluation model construction and empirical analysis

This section presents the overall research framework, hierarchical structure, and the relationships among the target layer (modern agricultural industrial park), project layer (natural, cultural, and production landscapes), and factor layer (21 indicators).

In this work, a combination of the analytic hierarchy process (AHP) and the semantic difference method (SD) was used to construct the landscape evaluation model of Guangzhou Zengcheng Simiaomi Modern Agricultural Industrial Park. First, an AHP hierarchical structure model was constructed, and after analyzing the relevant theories of landscape evaluation and the evaluation factors related to it were divided into target layer, criterion layer, sub-criteria layer and factor layer according to different attributes. The factors in the same layer are relatively independent but act together on the previous layer, and the factors in the upper and lower layers belong to a subordinate relationship. Secondly, the AHP determines the weights of the indicators, uses the hierarchical structure model to construct a judgment matrix, and combines expert opinions for weight assignment and consistency testing to finalize the comprehensive weights (Ma'in et al., 2025). Again, the SD method was used for index scoring, a survey of visitors to the modern agricultural industrial park was conducted, and the reliability and accuracy

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of the data obtained were tested with the help of SPSS software to obtain scores for each evaluation factor. Finally, the weight obtained by AHP was combined with the score obtained by SD method to calculate the final score of the park.

Evaluation system design

This work further adjusts and modifies the indicators based on the results of the pre-survey, combined with the feedback from the pre-survey form and the opinions of other industry experts. Removing indicators with similar semantic similarities and concepts and unreasonable and unnecessary, finally formed a project layer with natural landscape, cultural landscape and production landscape with landscape space (Overall spatial environment combining natural, cultural, ecological, and visual elements), ornamental plant landscape (Areas designed for aesthetic vegetation display, featuring decorative plants and gardens), park buildings, traffic roads, experience activities, agricultural landscape (Land dominated by crop cultivation, farming activities, and production spaces), agricultural production, and agricultural product processing as factor layers, A modern agricultural industrial park landscape evaluation index system (*Table 2*) containing 21 evaluation factor indicators and their corresponding 21 pairs of adjectives.

Calculation of indicator weights

In this study, the weight of each indicator of the landscape of Guangzhou Zengcheng Simiaomi Modern Agricultural Industrial Park to assign pairwise comparisons among indicators using the AHP 1–9 scale method. Consistency testing was performed to ensure the reliability and scientific validity of the weights. Subsequently, the relative degree of each indicator was determined by the consistency test, with the following specific steps:

Expert opinion consultation and judgment matrix construction

The acquisition of AHP weight information relies on decision-makers to give relative importance judgments, that is, weights, for each indicator in the hierarchy model. In order to quantify the weight information of the judgment decision, this study uses the relative scale (1～9 and its reciprocal for annotation, as shown in *Table 3* to compare the relevant factors at the same level in pairs to obtain the weight value, which improves the accuracy of the weight. At the same time, it reduces the difficulty of pairwise comparison between factors with different attributes.

Figure 2 illustrates weights and SD scores for all 21 indicators in the landscape evaluation. Among the 21 indicators in the indicator layer, the top three are naturalness, integrity, and landscape aesthetics. It is explained that when creating the landscape of the agricultural industrial park, attention should be paid to retaining the natural texture of the farmland, not destroying the overall agricultural landscape, creating an open and natural agricultural landscape, sorting out the original style of the park, and improving the beauty of the landscape (Gulinck et al., 2001; Marine, 2022; Wang et al., 2022).

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Table 2. *Modern agricultural industrial park landscape evaluation index system*

Target layer	Project level	Factor level	Indicator layer	Description	A pair of adjectives
Modern agricultural industrial park landscape (A 1)	Since Of course Scenery View (b1)	Landscape space (C1)	Landscape Aesthetics (D1)	The beauty of the natural landscape	Aesthetic-free-aesthetic
			Landscape seasonal phase (D2)	Whether the landscape changes significantly in all seasons	Non-seasonal - Seasonal changes are noticeable
			Space scale sensitivity (D3)	Whether the scale of the landscape elements is harmonised	Dysregulated-coordinated
		Ornamental plant landscapes (C2)	Overall coordination of plant landscapes (D4)	Whether the various plant-like combinations are coordinated	Disorganized-harmonious
			Plant-level richness (D5)	Whether the plant community has a composite hierarchy	Hierarchical monotonous - Hierarchical rich
			Plant vernacularity (D6)	Whether the landscape plants in the park have a strong vernacular character	Weak vernacular characteristics - strong vernacular characteristics
	People Text Scenery View (b2)	Park buildings (C3)	Building artistry (D7)	The artistic value reflected in the appearance of the buildings in the park	Ordinary-artistic
			Ornamental nature of structures (D8)	The ornamental value embodied in the structures of the park	Non-viewing-viewing
		Traffic roads (C4)	Accessibility (D9)	Number of park roads and ease of transportation	Troublesome-convenient
			Iconic (D10)	Whether the road can convey the identification of the road direction, location and distance information	Identified not obvious - Identified obvious
		Experiential activities (C5)	Agricultural industry experiential (D11)	The number and size of agricultural service projects, farming experiences, etc. in which tourists participate, and the degree of satisfaction	Experiential weak - Experiential strong
			Participation in popular science education (D12)	Whether the content of popular science education in the park is rich, and the degree of participation of tourists in popular science education projects	Low-participation - high-participation
			Satisfaction of the service industry (D13)	Whether the leisure and entertainment products, service items, etc. provided in the park satisfy tourists	Dissatisfied-satisfied
	Born	Agricultural	Integrality (D14)	The integrity and unity of the farmland	Cluttered-whole

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Target layer	Project level	Factor level	Indicator layer	Description	A pair of adjectives
	Produce Scenery View (b3)	landscape (C6)		landscape	
			Naturalness (D15)	Area ratio occupied by natural land in the agricultural landscape of the park	Artificial-natural
			Functional (D16)	Whether the agricultural landscape can meet the needs of production and the different levels of tourist demand	Absent-full-function
		Agricultural production (C7)	Sustainability (D17)	The ability of farming to consistently provide sufficient and high-quality agricultural products for current populations without compromising the resources and well-being of future generations.	Unsustainable-sustainable
			Modernisation (D18)	Whether agricultural production is high-yield, high-quality, low-consumption, protects the environment, and has high conversion efficiency	Traditional-modern
			Diversity of production facilities (D19)	Whether the variety of production facilities are rich and varied	Single-species rich
		Processing of agricultural products (C8)	Product quality (D20)	Whether the quality of agricultural products meets the requirements of health and safety	Inferior-quality
			Product characteristics (D21)	Whether agricultural products are distinctive or not, impresses visitors	Characteristic ambiguous - distinctive

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Table 3. *Table of scaling principles for the analytic hierarchy process*

Scale	Significance
1	The two factors are compared and have the same importance
3	Comparing the two factors, the longitudinal factor (Bi) is slightly more important than the transverse factor (Fj)
5	Comparing the two factors, the longitudinal factor (Bi) is clearly important in relation to the transversal factor (Fj)
7	Comparing the two factors, the longitudinal factor (Bi) is quite important in relation to the transverse factor (Fj)
9	Comparing the two factors, the longitudinal factor (Bi) is relative to the transversal factor (Fj) and its importance
Median value (2, 4, 6, 8)	The intermediate value of the adjacent judgment described above
Countdown1/2, 1/3……)	If Fi compares with Fj to score Fij, then Fj compares with Fi to score Fji=1/Fij

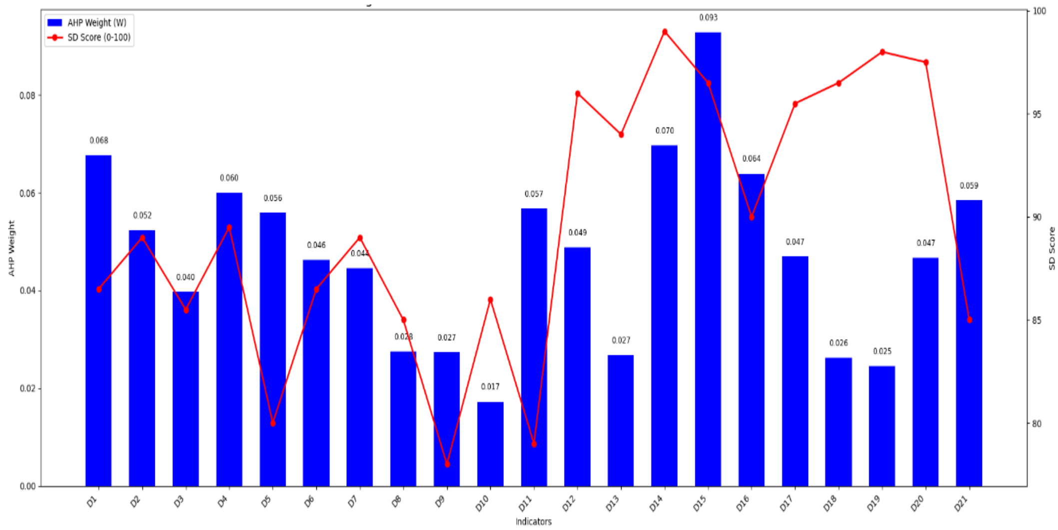

Figure 2. *AHP-derived weights and SD evaluation scores of the 21 landscape indicators for Guangzhou Simiaomi Modern Agricultural Industrial Park*

Measurement and weight determination of indicators

In this research, the weights and scores of 21 landscape evaluation indicators were determined using a combination of AHP and SD methods. A hierarchical structure was established with the target layer (modern agricultural industrial park), project layer (natural, cultural, and production landscapes), and factor layer (21 indicators). Expert judgments provided pairwise AHP weights, with consistency testing ensuring reliability. Visitor surveys and expert opinions supplied SD scores, which were normalized to a 100-point scale. Final indicator scores were calculated as Weight × Normalized Score, e.g., Agricultural landscape (0.2263) > Ornamental plant landscape (0.1621) > Landscape space (0.1598). Pre-survey feedback helped refine and validate the evaluation system. Pre-survey feedback helped refine the indicator system by

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eliminating redundancies, enhancing conceptual clarity, and optimizing the descriptive language of the indicators, resulting in a finalized evaluation model that balances scientific rigor with practical operability. *Table 4* presents the AHP weights, SD scores, and final scores for all indicators. Visitor surveys and expert evaluations were collected and normalized to a 100-point scale using the SD method. Final scores were calculated by combining the AHP weights with SD normalized scores. Pre-survey feedback and expert review ensured the accuracy and applicability of the final evaluation.

Table 4. *Weights, scores, and final calculation of landscape evaluation indicators*

Evaluation Indicators	Average Score Value	Score on the 100-Point Scale (T)	Index Weight (W)	Final Score (S)
D1	1.46	86.5	0.0677	5.85606
D2	1.56	89.0	0.0523	4.65470
D3	1.42	85.5	0.0397	3.39435
D4	1.58	89.5	0.0600	5.37000
D5	1.20	80.0	0.0559	4.47200
D6	1.46	86.5	0.0462	3.99630
D7	1.56	89.0	0.0445	3.96050
D8	1.40	85.0	0.0275	2.33750
D9	1.12	78.0	0.0274	2.13720
D10	1.44	86.0	0.0172	1.47920
D11	1.16	79.0	0.0568	4.48720
D12	1.84	96.0	0.0488	4.68480
D13	1.76	94.0	0.0268	2.51920
D14	1.96	99.0	0.0697	6.90030
D15	1.86	96.5	0.0928	8.95520
D16	1.60	90.0	0.0639	5.75100
D17	1.82	95.5	0.0469	4.47895
D18	1.86	96.5	0.0262	2.52830
D19	1.92	98.0	0.0245	2.40100
D20	1.90	97.5	0.0467	4.55325
D21	1.40	85.0	0.0585	4.97250
Total	33.28	1882	1	89.8895

The secondary indicator factor layer weights were calculated using the AHP. First, a pairwise comparison matrix was constructed using expert judgments. The geometric mean method was applied to extract the eigenvector values (E_i) for each indicator. These eigenvector values were then normalized using *Equation (2)* to obtain the final weight (W_i). All calculated weights sum to 1, ensuring consistency and comparability across indicators.

Step 1 — Calculate Eigenvector Values (AHP Pairwise Matrix)

$$E_i = \frac{Geometric\ Mean\ of\ row\ i}{\sum_{k=1}^{n} Geometric\ Mean\ of\ row\ k} \quad \text{(Eq.1)}$$

where, E_i is represented as an Eigenvector value of indicator, number of indicators is denoted as n.

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Step 2 — Convert Eigenvector to Final Weight

$$W_i = \frac{E_i}{\sum_{i=1}^{n} E_i} \quad \text{(Eq.2)}$$

where, W_i is represented as the final weight of indicator *i*.

The weight values presented in *Table 4* represent the normalized AHP eigenvector results. Each weight value (e.g., 0.0677 for D1) directly corresponds to the calculated eigenvector ratio obtained using *Equation (2)*.

Results and discussion

The landscape evaluation index system of Guangzhou Zengcheng Simiaomi Modern Agricultural Industrial Park was constructed, and three project-level indicators of natural landscape, cultural landscape, and production landscape were selected for measurement (Zhou, 2007; Li et al., 2018). Combined with expert opinions, the secondary indicator factor layer weight calculation results are as follows: Agricultural landscape 0.2263 > Ornamental plant landscape 0.1621 > Landscape space 0.1598 > Experience activities 0.1325 > Processing of agricultural products 0.1051 > Agricultural production 0.0976 > Park buildings 0.0719 > Traffic roads 0.0446. The first-level indicator weights are production landscape > natural landscape > human landscape. It can be seen from the SD method scoring table that the comprehensive score of the landscape evaluation of Guangzhou Zengcheng Simiaomi Modern Agricultural Industrial Park is 89.89, among which the productive landscape score is higher, with the highest average score of wholeness among the 21 three-level indicators, followed by Production facility diversity and product quality (Nelson et al., 2020; Stofkova et al., 2022). This shows that the agricultural landscape of the park is relatively complete and integrated, with complete modern agricultural facilities, and the quality of the products is trusted by the evaluators (Dai et al., 2021). It is worth noting that in terms of agricultural product quality, Zengcheng Simiaomi Modern Industrial Park has a Simiaomi Industrial Culture Exhibition Hall built in the park. This exhibition hall is located in the core area of Simiaomi National Industrial Park on Zhucun Street, Zengcheng District. It is a collection of publicity and education, cultural science popularization, and interactive experience. A comprehensive silk millet cultural exhibition center. The exhibition hall is divided into 6 spaces: the origin of silk seedling rice culture, the protection of silk seedling rice provenance, Zengcheng grain responsibility, modern agricultural interactive experience, Zengcheng digital agricultural industrial park exhibition area, and cultural and creative product display. Zengcheng silk seedling rice will be popularized in an all-round and diversified manner.

① In the production landscape, Zengcheng Silk Miao Rice Industrial Park is based on the first industry, builds a silk Miao rice planting demonstration base, continues to expand the scale of silk Miao rice planting, and has established cooperative relationships with many research institutes, universities, etc., with advanced production methods and agricultural products. The quality is effectively guaranteed, and a high-standard modern industrial park is built in accordance with the requirements of scale, greenness, standardization, and digitalization. ② Among the cultural landscapes, the Zengcheng Simiaomi Industrial Park has a high appreciation score for the artistry and structures of the buildings, the road accessibility is slightly lower than the average, and

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the walking route of tourists is too long. ③ Among the natural landscapes, the landscape evaluation score of Zengcheng Simiaomi Industrial Park is close to the average, the plant vernacular score is high, the seasonal nature of the landscape needs to be improved, and the overall natural landscape is slightly monotonous. In addition to large-area farming landscapes, other seasonal landscapes can be considered.

Strategy for planning for the integration of agriculture, culture and tourism

The present results show that the natural landscape is an important factor in the landscape evaluation of the Simiaomi Modern Industrial Park in Zengcheng, Guangzhou. In view of this, we should rely on the unique natural resources of the park to enrich its business formats, and actively create an urban pastoral cultural tourism destination with integrated development of agriculture, culture and tourism, in conjunction with comprehensive business formats such as the Silk Seedling Rice Industrial and Cultural Exhibition Hall, rice field trains, rice field cafes, and camp sites (Zhou et al., 2022).

Accelerate the construction of cultural landscape and strive to shape cultural connotation. The coordinated advancement of rural farming, cultural heritage, and tourism leverages modern agriculture as its foundation, tourism and leisure as its mode, and local culture as its core. This approach can drive the restructuring and modernization of agricultural systems, enhance the efficiency and quality of rural tourism, and elevate overall rural development standards. Farmers have increased their income and become rich, which has become a new engine to promote comprehensive rural revitalization and common rural prosperity. Accordingly, the Simiaomi Industrial Park should deeply explore the culture and create a unique cultural brand around Simiaomi.

Actively improve the production landscape and play the role of industrial landmarks. Rural revitalization, industry first. In response to the problem of low added value of agricultural products faced by the silk seedling rice industry, the industrial park should broaden its thinking, extend it vertically, create a full industrial chain of silk seedling rice, cross horizontally, and integrate agriculture, industry, science, tourism and business. A new landmark for rural revitalization in Guangzhou with the integrated development of the three industries. The results indicate that the Simiaomi Modern Agricultural Industrial Park exhibits a well-integrated landscape, with productive, natural, and cultural landscapes scored highest in integrity, naturalness, and aesthetics. These findings align with prior research emphasizing the importance of agricultural, cultural, and tourism integration for rural revitalization (Feng et al., 2019; Yang et al., 2022). The park's high-quality agricultural facilities and cultural experiences support sustainable tourism development and local economic growth. Limitations include seasonal landscape monotony and relatively lower road accessibility, suggesting areas for improvement. Overall, the study highlights the practical significance of combining natural, cultural, and production landscapes for comprehensive rural development and tourism enhancement.

Conclusion

This study uses Guangzhou Simiaomi Modern Agricultural Industrial Park as the empirical object. This construct a comprehensive evaluation system of agricultural landscape covering natural, humanistic and production dimensions, revealing the

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current landscape planning of agricultural industrial parks single industrial function and the core contradiction of inactivation of cultural genes. It was found that the upgrading of modern agricultural industrial parks requires breaking through traditional production-first path dependence and moving towards a spatial reproduction model with cultural empowerment as a link. From a practical perspective, agricultural landscape planning should be wary of the erosion of the agricultural production background cultural tourism, and must adhere to the value ranking agriculture- based, culture-based, and tourism-based to promote production in spatial design in order to achieve sustainable industry-village symbiosis in rural revitalization.

Limitations and future scope

This study is limited by factors such as seasonal landscape monotony, limited road metrics, and survey-based evaluation. Future research can incorporate detailed road measurements (length, density, connectivity), apply the evaluation model to other modern agricultural parks, and integrate advanced methods like AI or remote sensing to enhance accuracy, sustainability assessment, and comprehensive landscape planning.

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REFERENCES

[1] Bajpai, R., Choudhary, K., Srivastava, A., Sangwan, K. S., Singh, M. (2020): Environmental impact assessment of fly ash and silica fume based geopolymer concrete. – Journal of Cleaner Production 254: 120147. https://doi.org/10.1016/j.jclepro.2020.120147.

[2] Busby, G., Rendle, S. (2000): The transition from tourism on farms to farm tourism. – Tourism Management 21(6): 635-642. https://doi.org/10.1016/S0261-5177(00)00011-X

[3] Chao, Z. Z., Zhu, M. M. (2020): Integration of culture and tourism: connotation, challenges, and practice paths of multilevel relationships. – Journal of Tourism 35: 62-71. http://eng.oversea.cnki.net/kcms/detail/detail.aspx.

[4] Dai, H., Ni, J. F., Cai, X. L. (2021): Research on planning and design of modern agricultural industrial parks from the perspective of agricultural and tourism integration: Taking Liangfang Town, Pingxiang City, Jiangxi Province as an example. – Modern Agricultural Research 27(6): 4-6.

[5] Dai, H., Wang, J. T., Zheng, X. (2023): Development path and planning design of modern agricultural industrial parks: Simiaomi Industrial Park case. – Modern Agricultural Research 7: 7-10.

[6] Faridah, H., Pramukanto, Q. (2020): Landscape planning of tea plantation agrotourism area based on agro-based services. – IOP Conference Series: Earth and Environmental Science 418: 012016. https://doi.org/10.1088/1755-1315/418/1/012016.

[7] Feng, Q. L., Zhang, J. Y., Li, C. (2019): Exploration on rural revitalization model based on the convergence of agricultural industry, cultural industry and tourism industry:

Taking Shoushan Town in Fujian Province as an example. – Development of Small Cities & Towns 37: 67-75.
[8] Fu, C. W. (2022): National goals, regional characteristics, and planning suggestions for the construction of the Yangtze River National Cultural Park. – Decision and Information 8: 5-9.
[9] Gkoltsiou, A., Paraskevopoulou, A. (2021): Landscape character assessment, perception surveys of stakeholders and SWOT analysis: A holistic approach to historical public park management. – Journal of Outdoor Recreation and Tourism 35: 100418. https://doi.org/10.1016/j.jort.2021.100418.
[10] Guiqin, W., Huan, H. (2023): Strategy of rural culture–tourism integration driven by planning. – Economic Geography 43(12): 231-239. https://doi.org/10.15957/j.cnki.jjdl.2023.12.023.
[11] Gulinck, H., Múgica, M., de Lucio, J. V., Atauri, J. A. (2001): A framework for comparative landscape analysis and evaluation based on land cover data, with an application in the Madrid region (Spain). – Landscape and Urban Planning 55(4): 257-270. https://doi.org/10.1016/S0169-2046(01)00159-1.
[12] Hatan, S., Fleischer, A., Tchetchik, A. (2021): Economic valuation of cultural ecosystem services: The case of landscape aesthetics in the agritourism market. – Ecological Economics 184: 107005. https://doi.org/10.1016/j.ecolecon.2021.107005.
[13] Jahani, A., Allahverdi, S., Saffariha, M., Alitavoli, A., Ghiyasi, S. (2022): Environmental modeling of landscape aesthetic value in natural urban parks using artificial neural network technique. – Modeling Earth Systems and Environment 8(1): 163-172. https://doi.org/10.1007/s40808-022-01486-x.
[14] Jahromi, M. N., Jahromi, M. N., Pourghasemi, H. R., Zand-Parsa, S., Jamshidi, S. (2021): Accuracy assessment of forest mapping in MODIS land cover dataset using fuzzy set theory. – In: Forest Resources Resilience and Conflicts, Chapter 12, pp. 165-183. https://doi.org/10.1016/B978-0-12-822931-6.00012-5.
[15] Li, C., Xu, X. Y., Liu, Y. Y., et al. (2018): Research on rural landscape classification and evaluation methods. – Anhui Agricultural Sciences 46: 41-43.
[16] Li, Q. S. (2021): Study on the influence of TikTok marketing on the purchase intention of Tianmu Lake white tea based on logistic regression model. – Fujian Textile 12: 44-51.
[17] Luo, W., Liu, J. (2024): From tradition to innovation: The role of culture tourism in transforming Chinese agriculture. – Agriculture 14(11): 2042. https://doi.org/10.3390/agriculture14112042.
[18] Ma'in, F. (2025): Enhancing sustainable hospital design in Jordan: An AHP-based approach to energy efficiency and environmental protection. – Results in Engineering 26: 105319. https://doi.org/10.1016/j.rineng.2025.105319.
[19] Marine, N. (2022): Landscape assessment methods derived from the European Landscape Convention: Comparison of three Spanish cases. – Earth 3(2): 522-536. https://doi.org/10.3390/earth3020031.
[20] Nelson, M. D., Riitters, K. H., Coulston, J. W., et al. (2020): Defining the United States land base: A technical document supporting the USDA Forest Service 2020 RPA assessment. – General Technical Report NRS-191: 1-70. https://doi.org/10.2737/NRS-GTR-191.
[21] Pages, S. J., Getz, D. (1997): The Business of Rural Tourism: International Perspectives. – International Thomson Business Press, London.
[22] Priatmoko, S., Kabil, M., Akaak, A., Lakner, Z., Gyuricza, Cs., Dávid, L. D. (2023): Understanding the complexity of rural tourism business: Scholarly perspective. – Sustainability 15(2): 1193. https://doi.org/10.3390/su15021193.
[23] Rasoolimanesh, S. M., Seyfi, S. (2021): Residents' perceptions and attitudes towards tourism development: A perspective article. – Tourism Review 76(1): 51-57. https://doi.org/10.1108/TR-11-2019-0461.

http://www.aloki.hu ● ISSN 1589 1623 (Print) ● ISSN 1785 0037 (Online)
DOI: http://dx.doi.org/10.15666/aeer/2402_22892304

[24] Shen, Z., Yin, H., Kong, F., Wu, W., Sun, H., Su, J., Tian, S. (2024): Enhancing ecological network establishment with explicit species information and spatially coordinated optimization for supporting urban landscape planning and management. – Landscape and Urban Planning 248: 105079. https://doi.org/10.1016/j.landurbplan.2024.105079.
[25] Steinhardt, U. (1998): Applying the fuzzy set theory for medium and small-scale landscape assessment. – Landscape and Urban Planning 41: 203-208. https://doi.org/10.1016/S0169-2046(98)00059-0.
[26] Stofkova, J., Krejnus, M., Stofkova, K. R., Malega, P., Binasova, V. (2022): Use of the analytic hierarchy process and selected methods in the managerial decision-making process in the context of sustainable development. – Sustainability 14(18): 11546. https://doi.org/10.3390/su141811546.
[27] Sun, M. Q., Sun, C. R., Xiao, Z. X. (2020): Study on integrated development mode of "agriculture, culture and tourism" industry in She County, Anhui Province. – China Collective Economy 35: 123-126.
[28] Sung, D. G., Seoung-Hyeon, L., Je-Woong, K., Gi-Sung, C. (2001): Scenic evaluation of landscape for urban design purposes using GIS and ANN. – Landscape and Urban Planning 56: 75-85. https://doi.org/10.1016/S0169-2046(01)00174-8.
[29] Wang, S., Chen, S., Gao, W. (2022): Information services as a method to evaluate the sustainability of intangible dimensions of a historic urban landscape: A case study in Guangzhou, China. – Sustainability 15(1): 8. https://doi.org/10.3390/su15010008.
[30] Wang, L-Y., He, Y-P. (2023): Environmental landscape art design based on visual neural network model in rural construction. – Ecological Chemistry and Engineering 30(2): 267-274. https://doi.org/10.2478/eces-2023-0028.
[31] Wang, D., Shen, C. C. (2024): Impact of liminality in organic agricultural tourism on well-being: The role of memorable tourism experiences as a mediating variable. – Agriculture 14(9): 1508. https://doi.org/10.3390/agriculture14091508.
[32] Wang, S., Zhao, M., Ding, W., Yang, Q., Li, H., Shao, C., Wang, B., Liu, Y. (2024): Ecological suitability evaluation of city construction based on landscape ecological analysis. – Sustainability 16(21): 9178. https://doi.org/10.3390/su16219178.
[33] Xiang, L., Tian, Y., Pan, Y. (2022): Study on landscape evaluation and optimization strategy of Central Park in Qingkou Town. – Scientific Reports 12(1): 1978. https://doi.org/10.1038/s41598-022-06006-z.
[34] Yacamán Ochoa, C., Ferrer Jiménez, D., Mata Olmo, R. (2020): Green infrastructure planning in metropolitan regions to improve the connectivity of agricultural landscapes and food security. – Land 9(11): 414. https://doi.org/10.3390/land9110414.
[35] Yang, Z., Sun, T., Zhang, J. (2022): Research on campus plant landscape evaluation using AHP–SD: Southwest Forestry University example. – Agricultural Technology 42(24): 122-126.
[36] Yu, W., Spencer, D. M. (2021): Motivations, challenges, and self-transformations of farmers engaged in farm tourism on a tropical island. – Journal of Heritage Tourism 16(2): 164-180. https://doi.org/10.1080/1743873X.2020.1776296.
[37] Zhou, X. Q. (2007): New progress in rural landscape research in western countries. – Geography Research and Development 3: 85-90.

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