

The Value and Re-use Strategy of Traditional Houses Cultural Heritage: A Case Study of Wei's Manor, Qingmuchuan, Hanzhong, Shaanxi, China

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ABSTRACT

Chinese traditional culture is a vital pillar within ancient Chinese architecture. However, the urbanisation has jeopardised numerous traditional residential areas, facing the imminent threats of demolition or alteration. The article comprehensively analyses the foundational data of Wei's Manor in Qingmuchuan from various perspectives. It combines historical architectural evaluation indicators to construct an evaluation framework encompassing historical value, cultural and artistic value, scientific value, practical utility, and economic value. The framework is tailored to suit the characteristics of the Wei's Manor in Qingmuchuan. The framework weights are calculated using the Analytic Hierarchy Process (AHP) and expert questionnaires. Based on this, the framework scores are graded to assess the developmental and protective value of Wei's Manor. The findings serve as a theoretical basis for the historical preservation and development of Qingmuchuan, as well as the southern region of Shaanxi. The research results reveal that the historical value of the Wei's Manor in Qingmuchuan is 0.3542, cultural and artistic value is 0.2736, scientific value is 0.1844, practical utility is 0.0867, and economic value is 0.1011. In the process of development, it is essential to integrate with tourism economic growth and prioritise the development of its historical and cultural values.

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INTRODUCTION

The cultural heritage of traditional houses embodies the local traditions and national characteristics of the region, serving as tangible evidence of China's 7,000-year-old agricultural civilisation and showcasing the world the wisdom of diverse ethnic groups. Traditional residences play a pivotal role in vernacular architectural heritage while also serving as vital hubs for production and daily life in rural areas. The integration of these traditional houses with cultural heritage preservation will undoubtedly have a profound impact on villagers' livelihoods (Liu, 2018). Therefore, it is increasingly imperative to prioritise the safeguarding of vernacular architectural heritage within overall cultural preservation efforts.

Traditional village houses constitute an invaluable heritage of cherished traditional culture in the process of modern development. However, conflicts have arisen regarding construction, restoration, and preservation practices for these residential buildings with historical significance due to the demands of contemporary life (Zhang et al., 2023). Consequently, their architectural integrity and functionality have been compromised, resulting in a loss of authenticity as cultural relics. Furthermore, rapid economic progress has led to a dwindling market for traditional construction skills, posing a grave threat to their survival. The transmission of these skills from master artisans is at risk as many artisans transition into alternative professions for livelihoods (Wang et al., 2019). Those who continue practising are predominantly elderly individuals with limited education levels; even specialised artisans lack fluency in local dialects and struggle to find clients despite possessing exceptional craftsmanship abilities (Martínez, 2019). This absence of successors among traditional artisans exacerbates the decline in both their numbers and expertise over time (Law, 2020). In order to safeguard our rich heritage and ensure its continuity, comprehensive research and analysis must be undertaken on the construction techniques employed within traditional residential buildings (Qin, 2021).

This paper selects Wei's Manor, a typical traditional residence in Qingmichuan, an ancient Town in southern Shaanxi province, as an example. By consulting literature and collecting residential information through multiple on-site investigations, the paper analyses the spatial forms and construction techniques of residential houses, summarises the cultural heritage value of residential houses, and explores innovative paths for the protection and utilisation of residential houses under the background of high-quality rural development in the new era (Gao et al., 2021). It provides theoretical guidance for protecting and inheriting the material cultural heritage of traditional dwellings in southern Shaanxi. This paper focuses on the protection and utilisation of traditional houses in the southern province and makes a more in-depth study from the perspective of local architectural heritage protection.

LITERATURE REVIEW

The Research Trend: Strengthen cultural self-confidence and strengthen value inheritance

In nearly a century of development, the study of Chinese residential architecture has gradually sorted out its specific research objects, research contents and research methods, and the disciplinary attributes of residential architecture have gradually become clear (Xue et al., 2020). The research content of Chinese residential heritage covers different regions, objects and themes, including world natural heritage, world cultural heritage, settlements along land and water routes, production settlements and other object types involving ecological wisdom, conservation and renewal, and diversified research on building techniques, which is more targeted and inspiring for digging out the inheritance value of residential buildings and settlements in depth and specifically (Zheng, 2023). The static description of architectural regional characteristics in past research is effectively shifting to value mining based on cultural and regional attributes. Extending from the bare conceptual scope, the value inheritance and innovative development of residential research are continuously laying the academic foundation for firming the cultural self-confidence of Chinese residential architecture (Hu, 2023).

Research Vision: Systematisation and refinement under the intersection of disciplines

The connotation and extension of architectural research on traditional residential cultural heritage are becoming richer and richer. Most of the researchers have placed the study of residential buildings in the context of settlements, which breaks through the spatial and temporal limitations of static observation of buildings in the past and not only shows the characteristics of traditional Chinese architecture in constructing space with architectural groups, but also indicates that the vision of the existing research has been based on the predecessors, and the holistic, systematic and complexity of the residential buildings and settlement heritage issues have been further recognised (Gu, 2023). The deepening of the cultural connotation of residential architecture is to present its value and significance more comprehensively (Hu, 2023).

On the one hand, the objects and contents of the study range from architectural monoliths to settlements and from individual settlements to regional corridors and cultural routes in a macro spatial pattern, making a breakthrough, supplementing and leaping up at the spatial level, and spreading out through the interpretation of economic, social and humanistic motivating factors, and reflecting the systematic and integrated trend of the residential case study from typical cases to regional clusters with the results of mechanism analysis, law study and feature induction (An, 2023). On the other hand, the research team has been enlarged, the ways of on-site investigation have been increased, the technical means have been improved, more case study results have appeared, and the primary research contents, such as settlement pattern, architectural form, technique and decoration, have been refined (Zhang, 2023) so that the genealogy of the typical types of residential buildings in different regions and their derivation branches have become more and more enriched and clearer.

Research and Practice: Inheriting Construction Techniques and Experiences

The oriental construction experience embedded in traditional houses provides the practical basis for contemporary urban and rural construction and development and promotes the creative transformation and innovative development of traditional house culture (Huang, 2022). Since China put forward the strategy of rural revitalisation in 2017, the construction of villages has been rapidly advancing, and the protection and development of traditional villages have entered an unprecedented new stage (Ling, 2022). The inheritance of traditional "construction experience" has become a hot spot, and architects serving urban construction have entered traditional villages, resulting in many landmark events and practices (Qin, 2021). Conservation research cannot remain in the theoretical descriptions in books but requires in-depth research and practice, and we expect to realise the full integration and positive interaction of research, design, and construction in more rural construction projects.

METHOD AND MATERIALS

Case Study

The Wei's Manor is situated in the ancient town of Qingmuchuan in Ningqiang County, Hanzhong City, Shaanxi province; was constructed beginning in 1929, nearly a century ago (Fig. 1). The manor's owner, Wei Futang (1902-1952), was a prominent local figure, serving as the chief of the local militia and the head of the Red Gang. He ruled Qingmuchuan for over 20 years and was widely known as the "earth emperor." The manor's layout follows a traditional courtyard style, thoughtfully designed to align with the natural topography. It features brick and wooden structures adorned with intricate architectural decorations, making it of significant historical research value. In 2013, Wei's Manor was included in the seventh batch of national key cultural relics protection units. By 2019, it was also selected for the "Fourth Batch of China's 20th-Century Architectural Heritage" list, an honour jointly organised by the Society of Cultural Relics of China and the Architectural Society of China.

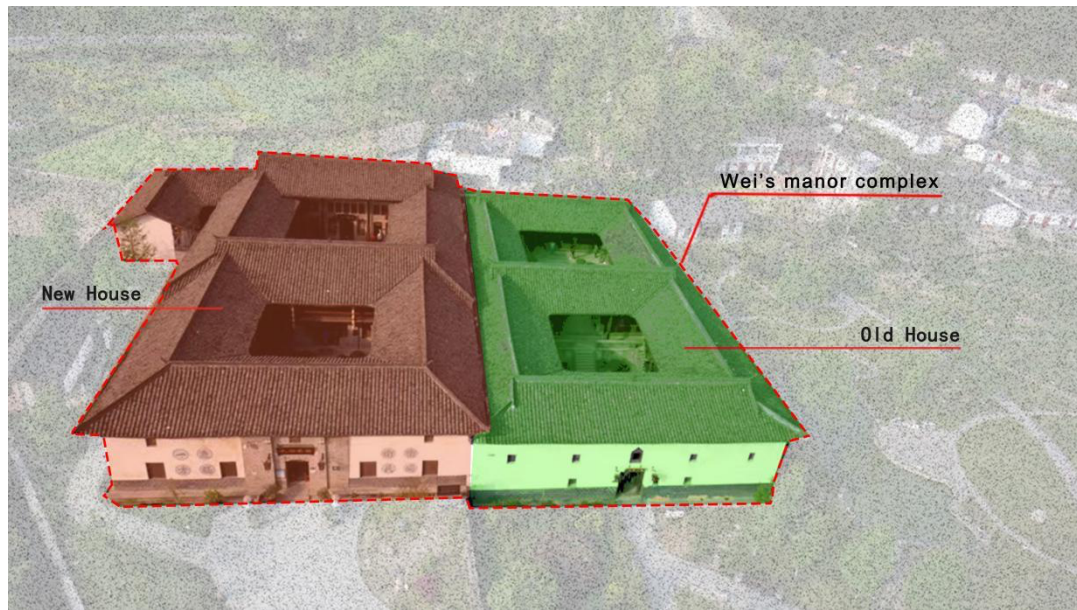


Fig 1. The Wei's Manor

Source: Authors (2024)

Spatial Morphological Characteristics

Wei's Manor old house part of the use of courtyard organisation of architectural space, a total of two quadrangles; the front yard is mainly external, divided into the upper and lower two floors, and there are corridors connected; the backyard is mainly for the owner to live in, the main hall is used for rituals, the two sides of the ear room and the compartments to live in, there is only one floor. There is a height difference of nearly 2.1 metres between the two courtyards (Fig. 2), which are connected by steps, which are in the middle and under the eaves on both sides, thus making full use of the terrain and distinguishing between inside and outside. Inside the courtyard, the floor and steps are paved with green stones, and the space is wide open. Although the dimensions of the front and back courtyards are close to each other, due to the difference in the enclosing interface, the space in the front courtyard feels more open and atmospheric.

The exterior of the old mansion of Wei's Manor appears to be relatively closed. The maintenance structure is built with rammed earth masonry, and there are only a few small round and square windows on the front except for the door, which is thick in volume and has a strong defensive nature. Therefore, from the outside to the inside, it creates a strong contrast visually and psychologically. The internal decoration of the building is mainly made of wood as the main, round doors and square windows; the pattern of the upper and lower layers is different; although the decoration of the old mansion does not have the beauty of magnificence, the rustic appearance and black and grey tones, more rustic taste too. At the same time, we can also see that despite the wind and rain, we can still imagine the grandeur of the old Wei family house in those years from the finely carved window lintels, stone carvings, and other details, as well as the building's tall volume and heavy lapis lazuli.



Fig 2. Wei's Manor Sectional Elevation

Source: Authors (2024)

Wei's Manor's new house on the west side of the old house (Fig. 3), built in the Republic of China in the 27th year, is an adobe structure of the building, the interior and the entrance with all green brick masonry, by the inside and outside of the two-patio courtyard composed of green bricks and plain tiles, the arched coupon colonnade. The courtyard is also very open, but it lacks the intimacy of an old house and seems a bit hard. In addition to the main hall of the backyard, the building is generally divided into two floors; usually, for the small single-room house, there is no primary and secondary, only on the first floor to the window corridor connected to the main hall and the two sides of the connection of the ring room with a wooden staircase. The walls on both sides of the main entrance are affixed with brick pilasters until the top and curved out to support the upper eaves, pilasters, and petal-like decorations, with a four-slope roof and rammed-earth walls on both sides of the building as a backdrop to the East-meets-West style at a glance.

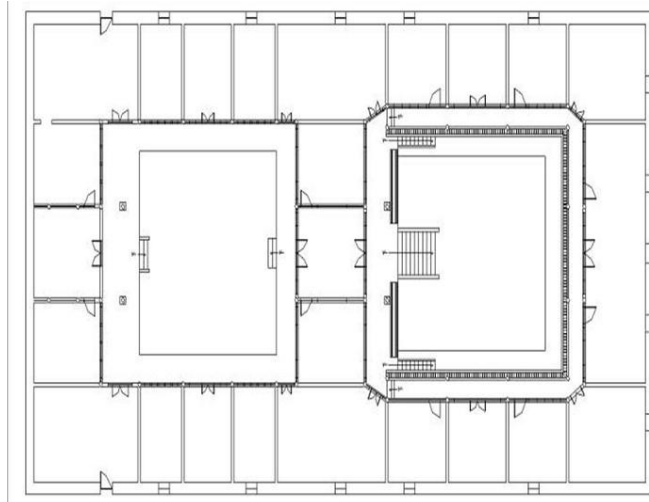


Fig 3. Wei's Manor Floor Plan

Source: Authors (2024)

Roof Type: The roof form of Wei's Manor adopts a sloping roof, with the eaves on both sides reaching beyond the mountain wall. The vertical ridge rises in front of the eaves to form a corner, making the roof more three-dimensional and vivid. The main ridge extends from the middle to the sides, and in the centre, there is a circular ridge decoration in the shape of copper coins formed by stacking tiles, which has the symbolism of auspiciousness and wealth (Fig. 4 and 5).

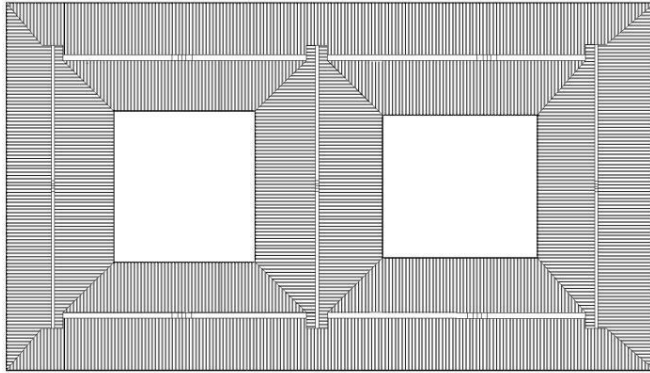


Fig 4. Wei's Manor Roof Plan

Source: Authors (2024)



Fig 5. An Image of Wei's Manor

Source: Authors (2024)

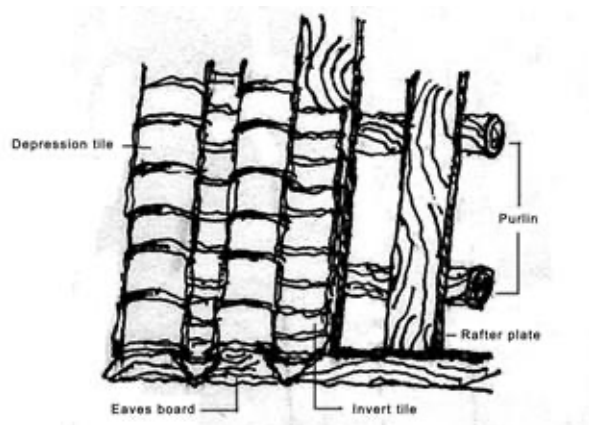


Fig 6. Cold Spread Tile Roofing

Source: Authors (2024)

The design and construction of the roof of Wei's Manor not only meets the drainage needs of the house but also adds to the beauty and artistic value of the building. The masonry of the building walls is made of exquisite materials with exquisite skills. It is mainly composed of green bricks, rammed earth bricks and granite. The granite wall base is buried under the soil layer, and the sturdiness of the selected materials ensures the long-term stability of the wall. The walls of the hall are built with green bricks, the hard texture of which has the effect of preventing dampness and increasing the durability of the walls, while the dark green colour brings an air of antiquity and elegance to the building. The two sides of the horizontal house and the walls of the courtyard adopt the two-stage masonry method of laying a layer of green bricks underneath and rammed-earth bricks on top, which was relatively low-cost and adapted to the economic conditions at that time.

The roof of Wei's Manor adopts cold-spread tile roofing, which is one of the simplest practices in tile roofing. The specific practice is to fix the rafters on the purlins, nail them, and hang the tiles directly on the rafters. This roofing practice is characterised by ease of construction and economy. Cold spread tile is the most common practice tile, a positive and a negative, each tile dislocation $1/3 - 1/5$; this is a drainage-based waterproofing as a secondary waterproofing way. Cold spreading tiles in the cylinder tile and the back tile are relatively flat; the top tile is semi-circular, and the overlap is the mouth of the enterprise, which can avoid the inflow of rainwater (Fig. 6.).

Structural framework: The building adopts the overhanging purlin frame, the brick wall is built according to the slope of the roof, no beams are used, the purlins are rested on the wall directly, the purlins are stretched out of the wall, and the brick wall is used to support the wood purlins, and rafter boards and tiles are laid on top of the purlins. There is no ceiling or ceiling over the hall, and the beams are inserted in the brick wall, so the structure of the house is hidden in the wall.

The structural form of the residential buildings in Qingmuche Ancient Town is generally similar to that of the pierced-double wooden frame, which is somewhat different from that of the traditional pierced-double wooden frame. The orthodox wooden frame with dense column spacing and roof loads is basically carried by floor-to-ceiling columns, and most of the through-fangs only play a linking role. The structure of the residential buildings in Qingmuche Ancient Town also consists of columns directly bearing purlins, and the columns are linked by the through-fang, forming a set of rows of frames, locally known as a fan. But the details are different; Qingmuchuan ancient town of residential wood frame in the vertical direction, there are columns and the same with the points, there is a certain spacing between the components, the columns on the top end of the purlin bearing the bottom end of the floor, the top end of the purlin bearing

the bottom end of the falling through the square, the upper end of the load will be transmitted by the through the square to the two sides of the columns. Located in the middle of the ridge of the column is called the middle column, located in the outermost door of the column, known as the given column; the rest have become gold columns (Fig. 7 and 8).

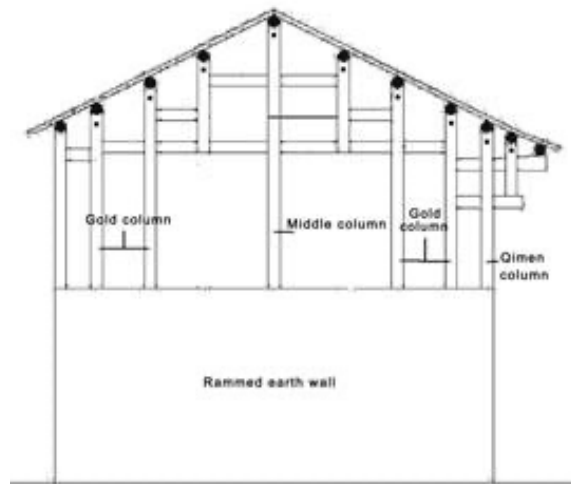


Fig. 7. Structural Framework

Source: Authors (2024)



Fig. 8. Rammed Earth Wall

Source: Authors (2024)

Decorative arts: Wei's Manor is the architectural expression of simple but not loose elegance, decorative components and patterns used more restraint, focusing on practicality and durability. Structural columns are mainly made of wood, and the column bases are made of stone. Their shapes are mainly in the form of vases, with the combination of cylinders and prismatic cylinders. The bracket is fixed between the beam

and the brick wall, playing a certain increase in the shear effect of the head of the beam, carved with a combination of spiral lines and petal texture pattern (Fig. 9).



Fig. 9. Decorative Elements

Source: Authors (2024)

RESULTS AND DISCUSSION

According to the planning standards for historical and cultural cities issued by the Chinese Ministry of Housing and Urban-Rural Development, historical buildings are defined as structures with certain historical, scientific, and artistic value that reflect the historical features and local characteristics of urban landscapes. The evaluation of the value of historical buildings serves as the foundation for their disclosure, modification, and improvement. A series of quantitatively weighted indicators form the scientific basis for the assessment. The paper employs the Analytic Hierarchy Process (AHP) to establish an evaluation framework. Firstly, it establishes three levels: the objective layer (O layer), the evaluation project indicator layer (A layer), and the evaluation project factor layer (C layer). Secondly, ten experts are invited (each expert's weight is set at 0.1) to compare the indicators of the evaluation project indicator layer (A layer) and the evaluation project factor layer (C layer), constructing comparative judgement matrices. Combining expert ratings and utilising the Yaahp software for calculation, the preliminary judgement matrices and weights for the evaluation project indicator layer (A layer) and the judgement matrices and weights for the C layer are obtained. Through consistency testing, the final weights for the architectural evaluation indicators of the Qingmu River Wei Family Manor are determined, as shown in Table 1.

Table 1. Value evaluation of buildings

Objective Layer	Criterion Layer (A)		Indicator Layer(C)		Integrated Weight
	Level One Indicator	Weight Coefficient W_i	Level Two Indicator	Weight Coefficient W_i	
Architectural value of the Wei's Manor (O)	Historical Value	0.3542	Building Period	0.5493	0.1945
			Historical Relevance	0.4507	0.1596
	Artistic Value	0.2736	architectural style	0.3353	0.0917
			Cultural expression	0.6647	0.1818
	Scientific Value	0.1844	Structural Style	0.7351	0.1355
			Building Materials	0.2649	0.0488
	Utility Value	0.0867	Structural Integrity	0.7418	0.0643
			Functional Rationality	0.2582	0.0223
	Economic Value	0.1011	Tourism value	0.5049	0.0511
			Development Potential	0.4951	0.0501

Source: Author (2024)

Historical Value

Wei's Manor is one of the more representative and well-preserved buildings in the folk houses in southern Shaanxi, which has important reference significance for the study of regional architectural culture and other aspects and has a high historical and cultural value. Existing architectural patterns, despite some changes, the overall layout, structure, and function still preserve most of the original style and, to a certain extent, also reflect the regional characteristics of the vernacular architecture is the study of southern Shaanxi province region vernacular architecture of the physical basis. It is appropriate to Wei's Manor as a carrier, the historical resources, rural landscape, historical and cultural heritage and other resources to sort out and integrate, make appropriate repairs, focusing on displaying the local outstanding national culture, inheritance of the region's unique architectural history and culture.

Artistic Value

Qingmuchuan ancient town Wei's Manor's interior decoration not only inherits some of the essence of traditional houses but also has the regional characteristics of southern Shaanxi province houses. Wei's Manor's interior decoration uses traditional carving art, carving decoration mainly in the form of wood carving, stone carving and brick carving; the carving themes are colourful, mainly divided into plants and animals, people and other subjects; there are traditional magpies, four treasures, lions rolling embroidered balls, etc., carving skills, items are lifelike, vivid, carvings are auspicious, most of the carvings express the occupants of a good life wishes and ideals of the literati. Most of the carving patterns are auspicious, and most of them express the good life wishes and ideals of the occupants. The decorations and ornaments on the spine of the houses are not only characteristic of the northern part of the country but also incorporate the aesthetic concepts and ideological pursuits of the owners of the Manor, which give people a beautiful and dignified visual effect.

Scientific Value

The Wei Manor in Qingmuche Ancient Town employs superb architectural engineering techniques and structural design. The unity of durability and aesthetics achieved through subtle structures and craftsmanship in the absence of modern technology in these buildings reflects human creativity and experience in technology. Studying these can help us understand the engineering techniques of the past while providing valuable lessons and insights in the field of architecture today. The construction of Wei's Manor in Qingmuche Ancient Town usually employs a variety of special materials, such as stone, wood and metal. Through the skilful use of these materials, the architects create stunning architectural structures and surface effects, demonstrating the artistic potential of materials in architecture. As a product of the perfect fusion and harmonisation of traditional Chinese philosophical thought, ethical system, Confucian culture, science and art with the living customs of the occupants, the Wei's Manor in Qingmuche Ancient Town covers a rich Chinese traditional culture and residential architecture culture and has an important research value and reference value.

Utility Value

Wei's Manor was originally the residence of Wei Futang, primarily used for living and entertaining. After being designated as a historical building in 2019, its practical utility has somewhat diminished. Currently, it serves primarily as a showcase space for architectural history, residential building culture, and related exhibitions.

Economic Value

Wei's Manor, as a historical figure's residence, is an important tourism resource; through development and utilisation, it can attract tourists to come to visit, study and exchange, drive the development of local tourism, and bring social and economic benefits to the local community. In the "Ningqiang County Tourism Development Master Plan" in Wei's Manor, which is positioned as a tourism brand-building project, the region's cultural tourism projects are relatively scarce. Can respond to the "southern Shaanxi province ethnic characteristics of cultural tourism corridor" construction planning, Qingmuche old street traditional historical and cultural neighbourhoods and architectural heritage sites, in the form of cultural routes to be strung together and integrated, digging deep into the national culture, cultural connotations of the characteristics of the multi-faceted, in-depth, innovative to create cultural tourism products, to give full play to the strengths of the region's tourism resources and potential to promote Economic development of the region.

CONCLUSION

The paper takes a multidimensional approach to analyse the foundational data of Wei's Manor. It integrates historical architectural evaluation indicators to construct an evaluation framework for Wei's Manor, considering historical value, cultural and artistic value, scientific value, utility value, and economic value. The framework's weights are calculated using the Analytic Hierarchy Process (AHP) and expert questionnaires. Based on this, the framework scores are graded, serving as a basis for assessing the developmental and protective value of Wei's Manor. The findings provide a theoretical foundation for the historical development of the Qingmu River, as well as the broader historical context in the Southern Shaanxi Province. The historical value assessment of Wei's Manor is 0.3542, cultural and artistic value is 0.2736, and economic value is 0.1011, indicating relatively high scores within the evaluation framework. Subsequent development and construction of Wei's Manor can be strategically focused on leveraging its historical and cultural/artistic values. This can be achieved by ensuring the protection of the historical building's structure and original features through necessary restoration efforts to maintain its historical integrity. Additionally, presenting the historical background, construction process, and stories related to local culture, including historical figures, can effectively communicate the architectural history to the

public. Simultaneously, incorporating the historical building into cultural tourism routes can attract visitors. This approach allows tourists to gain a deeper understanding of the historical and artistic value of the architecture. Furthermore, the development of tourism can stimulate economic growth in the region.

Potential limitations. The limitations of this study are primarily reflected in the following aspects: first, the research focuses solely on the Wei's manor in Qingmuchuan, making its conclusions less generalisable and difficult to apply to traditional residences in other regions. Second, the weighting of evaluation indicators relies on subjective judgments by experts, which may affect the accuracy of the results. Additionally, the analysis of practicality and economic value is relatively simplistic, lacking in-depth exploration of how to enhance the modern applicability of traditional residences. Lastly, the study does not thoroughly discuss the balance between tourism development and cultural preservation, which may limit the practical applicability of the recommendations.

Future research. It can enhance the generalisability and applicability of its findings by expanding the study scope, incorporating diverse research methods, and conducting in-depth exploration of ways to improve the practicality and economic value of traditional residences. Furthermore, more in-depth empirical studies on the balance between tourism development and cultural preservation are needed. Exploring the establishment of a dynamic evaluation system that can adapt to different stages of development could provide more comprehensive and practical guidance for the sustainable development of traditional residences.

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CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits or commercial or financial conflicts and declare the absence of conflicting interests with the funders.

AUTHORS' CONTRIBUTIONS

Tian Haining carried out the research and wrote and revised the article. Esmawee Endut and Rohaslinda Ramele anchored the review, revisions and approved the article submission. Srazali Aripin and Cui Yan participated in the article review, provided revision suggestions for the paper.

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