

A Study of the Architectural Culture of the Zhujia Courtyard in Shan County, Heze, Shandong, From the Perspective of Cultural Heritage Conservation in the Yellow River Basin^{*}

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As a representative surviving example of residences associated with officials and merchants in the southwestern Shandong region of the lower Yellow River Basin, spanning the Ming and Qing Dynasties to the modern period, the Zhujia Courtyard in Shan County functions as a built medium through which commercial capital and clan culture were closely intertwined. Drawing on field investigation and a review of the literature, this study examines its architectural and cultural characteristics across five dimensions: an overview of the courtyard, spatial layout, structural system, decorative arts, and cultural meanings. The analysis points to four interrelated cores, including the spatial embodiment of Confucian ethics, the status aspirations of canal-based merchant groups, adaptive strategies shaped by Yellow River conditions, and the symbolic articulation of folk beliefs. The Zhujia Courtyard demonstrates the technical sophistication and regional character of traditional architecture in southwestern Shandong and provides evidence of northern China's social structure and cultural traits during the Ming-Qing period. As a typical case, it contributes to research on regional architectural culture in the Yellow River Basin and offers a reference for heritage conservation and adaptive reuse of traditional architecture.

Keywords: Yellow River Basin, Heze Shandong, Zhujia Courtyard, architectural culture

Introduction

Heze lies in southwestern Shandong Province on the southern bank of the lower Yellow River. Its jurisdiction includes Mudan District, Dingtao District, and the counties of Cao, Shan, Chengwu, Juye, Yuncheng,

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Juancheng, and Dongming, covering about 12,239 km² (Figure 1). Long-term Yellow River sedimentation and repeated population movements have made the area a cultural crossroads where Yellow River, Central Plains, canal, and Water Margin (Shuihu) traditions intersect. Local dwelling forms, including courtyard houses, adobe houses, and brick-and-tile buildings, make this architectural culture visible in built form. Their spatial organization and building practices respond to the alluvial-plain environment, climate, and local customs, resulting in a distinctive regional character.



Figure 1. Location map of Heze, Shandong Province, China.

The architectural culture of the Zhujia Courtyard is a composite system rooted in southwestern Shandong in the lower Yellow River Basin. Against the backdrop of the Zhu family's official-and-merchant status in Shan County from the Ming and Qing period through the modern era, it brings together adaptive knowledge shaped by Yellow River conditions, a Confucian ethical order, canal merchant culture, and local folk practices.

Overview of the Residential Complex

The Zhujia Courtyard is located at the southwestern corner of the old county seat of Shan County. It extends north to the city's central east-west street, now Shengli Road, west to Xima Road inside the moat, and east to the road north of Xiaoyushou. According to the 2023 archaeological survey and mapping data of the Shan County Cultural Relics Protection Center, it originally covered approximately 53,334-66,667 m². Only the core areas of the East Courtyard and West Courtyard survive today, totaling about 13,333 m². Other parts were lost due to war damage and later urban construction.

The Zhujia Courtyard was first built in 1526, the fifth year of the Jiajing reign of the Ming Dynasty. Beginning with Zhu Pei in the mid-Ming period, it was expanded and rebuilt over 10 generations and once contained more than 200 rooms, making it the most prominent clan courtyard within the county seat. After repeated destruction, only the East Courtyard and West Courtyard remain.

The Zhu family was a leading local lineage that accumulated wealth through commerce, including the grain trade, pawn businesses, and money shops, while also holding gentry and official status. Some members obtained rank through contribution-based purchase or the imperial examination system. The Zhujia Courtyard therefore reflects the interweaving of commercial capital and clan culture in southwestern Shandong during the Qing period.

Spatial Layout and Ritual Order

As the courtyard of a leading official-and-merchant lineage in Shan County, the Zhujia Courtyard was shaped by the Zhu family's social standing, lineage organization, and security needs. It follows an ordered layout in which Confucian ritual norms provide the framework and functional demands guide use. This produces a locally distinctive layout in southwestern Shandong, which expresses hierarchical lineage ethics while meeting the practical needs of a merchant family.

The Zhujia Courtyard is organized by two north-south axes, reflecting a strict ritual order. It is formed by two parallel three-section courtyards and is enclosed by the principal room, side rooms, east and west wing rooms, a screen wall, and courtyard walls. Because it lacks a southern row of rooms, this dual-axis arrangement resembles a dustpan and is locally known as the Boji-cha type (Figure 2).

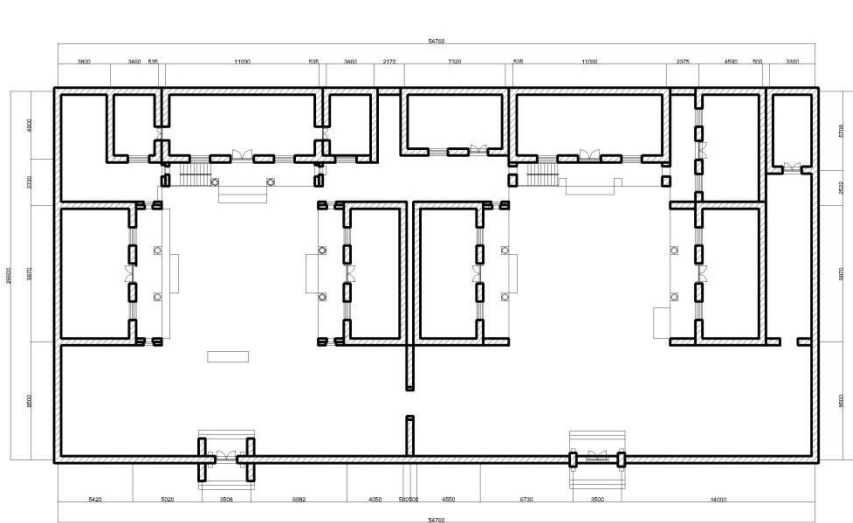


Figure 2. Plan of the Zhujia Courtyard in Shan County, Heze City.

Each courtyard has a defined functional program and functions as the basic spatial unit. Hallways, covered corridors, and screen doors connect these units and mediate transitions, ensuring efficient movement while producing layered spatial sequences. The rooms accommodate the owner's quarters, guest rooms, a study, an accounts room, storage, and servants' rooms. Overall, the Zhujia Courtyard is outwardly enclosed and inwardly focused, combining defensibility with privacy in response to security concerns typical of merchant households.

Hierarchical order is expressed most clearly through the placement and specification of the principal room on the courtyard axis. In the West Courtyard, the main building is two storeys with five bays on each level and follows a "three principal rooms and two side rooms" arrangement. The central bay functions as the main hall, also called the tangwu, and is slightly wider than the adjacent bays. A baxian table is set at the center facing the gate, with ancestral tablets placed on it. Side rooms flank the principal room and share its orientation. They typically served as bedrooms for unmarried daughters and sometimes as storage. Local practice requires that side rooms remain subordinate in scale, with height and depth not exceeding those of the principal room, and they are connected to the adjacent bays through partition doors. The east and west wing rooms are used by younger generations. The East Wing Room is considered higher in status and is assigned to the eldest son. Construction

norms require both wing rooms to be lower than the principal room, and the principal room must also be structurally “higher” than the wings in foundation setting; otherwise it is regarded as disrespectful to elders. In the East Courtyard, the main building is two storeys with three bays and typically follows a “one bright and two hidden” layout, with no side rooms. The wing-room buildings in the East Courtyard and West Courtyard share the same structural scheme.

The parallel dual-axis layout and the “east honored, west humbled” order can be read as a vernacular realization of Confucian ritualized space rather than a purely regional habit. In line with Pan Guxi’s discussion of the “threefold ritual nature” of domestic architecture, namely hierarchy, ethics, and practicality, the Zhujia Courtyard aligns hierarchy with ethics through height differences between the principal room and wing rooms and through functional division between the East Courtyard and West Courtyard. Assigning the East Wing Room to the eldest son projects primogeniture into space. Meanwhile, linking courtyards into an integrated whole through hallways and corridors corresponds to Fei Xiaotong’s “differential mode of association”, characterized by kinship-centered social networks. This translates lineage identity into built form and reinforces internal cohesion.

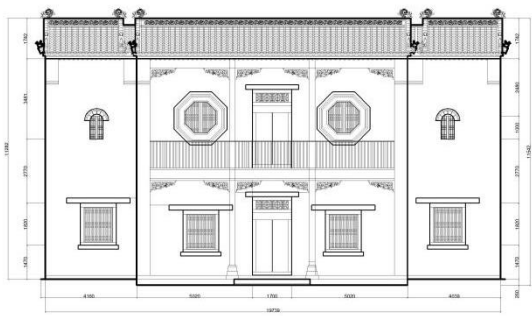
In addition to hierarchy-based functional zoning, the layout also aligns with local feng shui concepts through the placement of the screen wall, kitchen, and toilets, integrating ritual order with auspicious intentions. Auxiliary rooms for the kitchen and toilets are arranged on the eastern side. In five-phase reasoning, the kitchen is associated with fire, while east and southeast correspond to wood, and wood is believed to generate fire, which is taken as favorable. Toilet placement is commonly described as women’s toilets in the Kun sector on the right and men’s toilets in the Xun sector on the left. Because there is no southern row of rooms, the entrance is positioned directly opposite the principal room. A screen wall is set facing the gate to separate inside from outside, block sightlines, and articulate the courtyard. In feng shui terms, it moderates airflow and avoids a direct, rushing qi path.

Structural Features

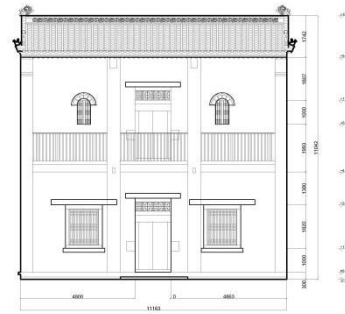
If the spatial layout provides the overall framework of the Zhujia Courtyard, its construction system gives that framework structural capacity. To support the large scale and hierarchical requirements of its dual-axis, three-section courtyard layout, the courtyard adopts post and lintel construction typical of elite official-and-merchant houses in southwestern Shandong. Refined brick-and-tile workmanship contributes to structural stability and status signaling.

Today, the Zhujia Courtyard survives mainly as two core groups, the East Courtyard and the West Courtyard. Their main buildings follow a unified formal system while differing in scale, gallery placement, and detailing. In the East Courtyard, the main building is three bays and two storeys. It uses refined brick-and-tile workmanship, and the covered gallery is arranged on the upper storey. Timber columns and drum-shaped column bases serve as the primary supports. As a key “column-base” interface, the column base isolates ground moisture to reduce timber decay, transfers roof loads to the foundation, and restrains lateral movement of the column to enhance stability. Its proportioning also aligns with prescriptions in the Yingzao Fashi that column bases be scaled to column diameter. The east and west wing-room buildings in the East Courtyard share the same form. Each is three bays and two storeys, with the covered gallery on the ground storey. The measured dimensions are 10 m in length, 6 m in width, and 10 m in height. Aside from the gallery position, their construction features are consistent with the main building.

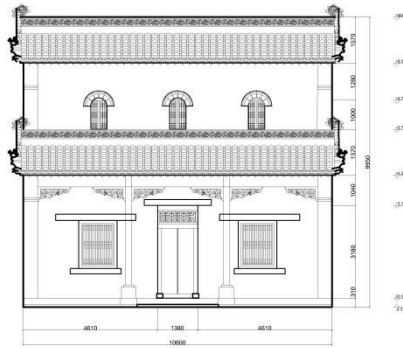
In the West Courtyard, the main building is slightly larger. It is five bays and two storeys, with a gallery set across three bays. Under the eaves, decorative timber members such as architraves, sparrow braces, and cushion boards are applied. The measured dimensions are 20 m in length, 7 m in width, and 11 m in height. The east and west wing-room buildings in the West Courtyard match the wing-room portions in form and construction, producing a coordinated courtyard profile (Figure 3).



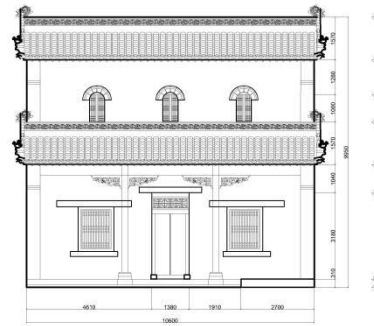
(a) Main building of the West Courtyard.



(b) Main building of the East Courtyard.



(c) East wing room.



(d) West side room.

Figure 3. Elevations of the main hall and the east and west side rooms of the Zhujia Courtyard.

Overall, the Zhujia Courtyard uses gray brick masonry and gray tile roofing, with small gray clay tiles as the roof covering, which supports both durability and visual refinement.

Specifically, the roof framing of the Zhujia Courtyard adopts a five-purlin post and lintel construction without eave galleries. Its structural logic is as follows. Purlins are set at both ends of each beam, and short struts are placed on the beams. In the depth direction, beams are stacked to carry successive purlins, and child posts above the stacked beams support the ridge purlin. Rafters are then laid over the purlins, forming a complete roof frame (Figure 4).

Door and window openings follow traditional construction rules. A timber lintel laid in a flush masonry course is used as the load-bearing support for the wall above the opening. The windows are fixed vertical lattice windows of the “thirteen-mullion, seven-transom” type. They are set within the wall thickness and provide both daylighting and resistance to windblown sand, in line with the climatic conditions of southwestern Shandong (Figure 5).

With about 700 mm of annual precipitation and frequent heavy rain, roof leakage is a persistent challenge in the floodplain setting of southwestern Shandong. The Zhujia Courtyard uses a hard-gable, double-slope roof covered with curved pan tiles. Its key waterproofing measure is the “zhuojie-jialong” technique. At the junction between two rows of flat tiles, a ridge of curved tiles is laid as a cap. Mortar is packed tightly into the gap between the under-tile ridge and the cover-tile ridge, and the joints between adjacent curved tiles are pointed with mortar. Together, these steps block rainwater from penetrating the roof layers and substantially improve waterproof performance. The choice of curved pan tiles also aligns with the status positioning of an elite merchant courtyard and reflects the technical standardization of traditional construction in southwestern Shandong (Figure 6).



Figure 4. Timber structural frame.



Figure 5. Lattice window.



Figure 6. Front view of a wing room.

The roof ridge is both a waterproof sealing line and a key decorative zone. The Zhujia Courtyard follows a standard “five ridges and six beasts” configuration, with a solid main ridge finished with floral and vegetal motifs. The gable-end ridges adopt a small-scale lingdang type, locally termed paishan-goudi, a form widely used in vernacular architecture under status constraints.

Ridge ornament is articulated through ridge beasts. The main ridge ends are finished with *jiuzi chiwen* rendered with open mouths as if gripping the ridge, and five crouching figurines are placed along the hip ridge. In contrast to the conventional official repertoire, the Zhujia Courtyard adopts more vernacular themes, including domestic animals and peace-oriented symbols, reflecting adaptation to local custom and its historical context.

Niutou is a vernacular ridge-end element in southwestern Shandong derived from a simplified version of the official “immortal riding a phoenix” motif. It is set at the lower end of the hip ridge and is built as a layered

masonry-and-tile termination capped with curved tiles and topped by a chuishou, representing a localized adaptation of official roof-ornament norms.

A stable structural system provides the physical support for ornament, and decoration becomes the most direct medium through which the cultural meanings of the Zhujia Courtyard are communicated. Rather than pursuing excessive density, the courtyard centers its decorative program on brick, wood, and stone carvings, hereafter referred to as the “three carvings”. Through these media, regional craftsmanship embeds Confucian ethics, merchant-family aspirations, and folk belief into architectural details. The following sections summarize their locations, techniques, and motifs.

Brick Carving

Brick carving in the Zhujia Courtyard is dominated by high relief, supported by shallow relief and openwork carving. It is concentrated in transitional architectural zones such as the main ridge, screen wall, and gatehouse, producing an approach characterized by site-specific placement, refined technique, and varied subject matter. The carvings are executed in locally sourced gray bricks with a fine texture and strong weathering resistance, which supports both detailed workmanship and long-term preservation. As a representative example of brick-carving practice in Qing-period courtyards in southwestern Shandong, this high-relief narrative program uses gray brick as its medium to integrate ritual order, merchant culture, and regional construction knowledge, forming a distinctive decorative pattern in the lower Yellow River area (Figure 7).



(a) Brick carving on the main ridge.



(b) Chiwen on the main ridge.



(c) Ridge beasts.



(d) Beast-mask eaves tile-end (wadang).

Figure 7. Brick carvings in the Zhujia Courtyard.

More specifically, its artistic character is expressed in two aspects. First, in technique, high relief is dominant. On the main ridge, floral and scrolling-vine motifs project strongly from the background, creating a pronounced vertical depth and a layered, sculptural effect. Ridge and tile-end motifs together form a coherent ornamental sequence that reinforces the roofline as a key decorative zone. Second, in subject matter, the program is diverse and meaning-oriented. Motifs fall into four major categories, including flowers, bogu objects, auspicious beasts, and narrative scenes. The floral motifs on the main ridge convey wishes for blessing and good fortune and project everyday aspirations. The beast-mask motifs on the eaves tiles signify apotropaic protection, warding off evil and safeguarding domestic peace, while also expressing a desire for auspiciousness and dignity. At the center of the

screen wall, motifs such as cranes, deer, and the “Four Gentlemen” plants, namely plum, orchid, bamboo, and chrysanthemum, provide a direct visual expression of spiritual ideals and life expectations.

Wood Carving

Wood carving in the Zhujia Courtyard is widely applied to lattice doors and windows, beams and purlins with sparrow braces, and interior partitions, producing a consistent integration of function and ornament. Timber selection relies mainly on local hardwoods in southwestern Shandong, especially elm and pagoda tree. Higher-grade woods such as nanmu and camphor are used for key decorative locations, ensuring durability while enabling fine carving.

As core decorative elements on both exterior and interior eaves zones, timber ornamentation and motif choices reveal regional aesthetics and status cues. Under the eaves of the principal room, sparrow braces with scrolling-vine motifs are used. Compared with the more elaborate official repertoire, these braces follow a restrained design principle that favors clarity and elegance. They combine wood relief carving with polychrome painting, with smooth lines and moderate ornamental intensity, so that structural assistance and visual expression are both achieved. Sparrow braces at the main gate use the same scrolling-vine theme, but with noticeably higher precision and greater technical complexity, reinforcing the entrance as a visual focus.

The zouma board, also called the doorhead board, is an exterior decorative member added during later repairs. Its surface is painted with auspicious motifs such as dragons and ruyi patterns. As a visual symbol of hierarchical order, the dragon motif, combined with the blessing connotations of the ruyi motif, both signals the Zhu family’s social standing and conveys a folk desire to seek good fortune and avoid misfortune (Figure 8).



(a) Front gate.



(b) Rear gate.

Figure 8. Gate decorations.

Wood-carving techniques vary by component location and function. Lattice doors and windows, as well as interior partitions, rely mainly on shallow relief, with geometric patterns such as square grids, diamond motifs, and swastika motifs, supplemented by simple floral designs. In contrast, composite members that combine load-bearing and decoration, including beams and sparrow braces, use deep relief or openwork carving. Their themes often feature auspicious birds and animals and scenes drawn from opera stories, combining narrative content with visual appeal.

In terms of meaning, motifs can be grouped into three categories. The first reflects literati taste, including the “Four Gentlemen” plants, fishing—woodcutting—farming—reading scenes, and landscapes with pavilions, which signal the Zhu family’s cultural aspirations as Confucian merchants. The second expresses lineage continuance, including motifs such as guadie mianmian, represented by gourd vines with butterflies as a metaphor

for thriving descendants, and liukai baizi, which implies many sons and abundant blessings. The third conveys auspicious symbolism and merchant identity. It includes ruyi motifs, the pan-chang knot as a sign of continuity, vases as a symbol of peace, and coins and ingots that imply wealth. Compared with brick carving, wealth-related motifs in wood carving are expressed more subtly, reflecting the restrained aesthetic associated with northern Confucian merchants.

In comparison with the ornate density of Huizhou wood carving, exemplified by the “hundred sons” compositions in Huizhou dwellings, and the heavy, mass-oriented style of Jinzhong wood carving, as seen in beam and bracket carvings at the Qiao Family Courtyard, the wood carving of the Zhujia Courtyard emphasizes clarity and narrative. The “Four Gentlemen” motifs are rendered primarily through linear outline, and opera-story panels prioritize plot presentation over minute decorative accumulation. This approach aligns with the pragmatic and restrained cultural temperament of southwestern Shandong and with the Zhu family’s identity as Confucian merchants, forming a distinctive pattern of wood-carving decoration in official-and-merchant courtyards of the lower Yellow River area (Figure 9).



Figure 9. Wood carvings in the Zhujia Courtyard.

Stone Carving

If brick carving uses high-relief narration to signal status and wealth, and wood carving conveys Confucian-merchant taste through restrained motifs, stone carving anchors the courtyard through a solid and plain material presence. Together, the three media form an ornamental pattern often described as “plain on the outside, refined within”, combining material restraint with crafted detail. In the Zhujia Courtyard, stone carving is concentrated in column bases, drum-shaped bearing stones at the gate, and screen walls. The stone is mainly local bluestone or sandstone, which is workable, durable, and well suited to the regional environment, implying a close connection between building and land.

Stylistically, the stone carving emphasizes mass, restraint, and symbolic meaning. Compared with the bold roughness often associated with Shanxi stone carving and the dense delicacy often associated with Minnan stone carving, it favors overall volumetric composition and cultural symbolism, consistent with an aesthetic that values substance over ornate display. On the screen wall of the West Courtyard, multi-layer relief depicts auspicious motifs such as cranes and deer. The crane signifies longevity, and the deer, as a homophone for *lu*, implies rank and prosperity. In the East Courtyard, the central screen-wall panel features the “Four Gentlemen” plants, namely plum, orchid, bamboo, and chrysanthemum.

At the gate, drum-shaped bearing stones, locally called “menguzi”, function as a visible marker of status in vernacular dwellings. They are composed of a base, a drum pedestal, a drum body, and a drum cap, producing a clearly tiered form. The base combines shallow and deep relief to heighten three-dimensionality through contrasts of solid and void. The drum body uses shallow relief and incised lines to render plant motifs with regular, fine lines, and auspicious meanings. The drum cap is shaped in deep relief into an animal-head form that appears solemn and authoritative and also carries an apotropaic function in folk belief. The craft and formal design of this element demonstrate the maturity and regional character of stone carving in southwestern Shandong. Due to long-term wear and repair, the gate stones visible today are later restorations.

The column bases are plain inverted-basin types without carved ornament. Their profile rises upward in a plate-like form resembling an upturned basin. In comparison with the Shanxi and Minnan traditions noted above, these elements remain deliberately generalized in detail, privileging mass and symbolism, and they exemplify the same restrained aesthetic orientation (Figure 10).



Figure 10. Stone carvings in the Zhujia Courtyard.

Cultural Meanings

The Zhujia Courtyard translates cultural ideas into built form through its spatial order, construction choices, and decorative program. The following sections discuss four cultural dimensions that shaped this translation.

Confucian Ethical Culture

The architectural form and spatial organization of the Zhujia Courtyard are not merely technical or aesthetic outcomes. They operate as a material carrier of deeper cultural concepts, among which Confucian ethics constitutes the core logic that structures space. As discussed above, the axial and symmetrical layout, together with the “east honored, west humbled” division, aligns with Confucian ideas of ritual governance that discipline domestic space. Its conceptual roots can be traced to classical ritual principles that emphasize “distinguishing directions and fixing positions” as a way to order the social world through spatial arrangement. From the perspective of theories of spatial practice and the production of space, translating abstract ethics into a visible spatial order functions to consolidate hierarchical identification and internal cohesion within the lineage, and it interlocks with the clan-based social structure characteristic of the region.

In the courtyard’s spatial hierarchy, the logic of “east as honorable, center as noble, west as subordinate” is consistently maintained. The eastern zone is assigned to the household head and the senior branch, affirming the authority of elders. The central zone serves as a shared ritual and public arena for ancestral rites and guest reception, and it becomes the principal stage on which family reputation and ethical order are displayed. The western zone is allocated to younger generations, servants, and logistical functions, marking a subordinate position. Through this functional zoning, social distinctions are narrated in space and Confucian ritual norms are made tangible as an everyday order.

At the level of spatial organization, individual courtyards are linked through hallways and corridors into an integrated whole, suggesting a lineage community connected by shared descent. The inward-facing enclosure formed by tall courtyard walls provides security and supports the formation of a self-contained family realm. Externally, the courtyard presents a low-profile and restrained posture, and internally it materializes the cohesion of the lineage.

Canal Merchant Culture

Beyond the Confucian ethical framework, canal-based merchant culture in the Ming-Qing period provided a major economic and social force in southwestern Shandong and further shaped the architectural logic of the Zhujia Courtyard. The prosperity of grain transport along the Grand Canal fostered merchant groups in the region. The growth of the Jining section of the canal, in particular, stimulated trade in Shan County. Benefiting from this transport system, the Zhu family developed businesses in grain trading, pawn services, and money shops and became a representative merchant lineage in southwestern Shandong.

This commercial background required the courtyard to communicate wealth while avoiding overt conflict with the status hierarchy embedded in traditional social order. As a result, it developed an “outer plain, inner refined” strategy that combines an explicit display of economic capacity with a more restrained, culturally coded response to identity pressure. On the level of visible wealth, the overall scale of the courtyards and the refined workmanship of the “three carvings” translate commercial success into built form.

Unlike more demonstrative patterns sometimes seen in southern merchant residences, the Zhujia Courtyard maintains a restrained exterior of gray brick and gray tiles while concentrating decorative refinement in interior-facing spaces. This balances wealth display with an ethic of moderation and discretion, and it aligns with a northern mercantile temperament often described as pragmatic and inwardly restrained. In parallel, the courtyard uses cultural symbols to negotiate status. Literati-themed subjects are introduced in spaces such as the study, and motifs such as plum, orchid, bamboo, and chrysanthemum reinforce moral narratives associated with Confucian

self-cultivation. Examination-oriented symbols are also embedded in decorative details, expressing the family's aspiration for descendants to succeed in the imperial examinations and to enter official society. In this way, economic capital is converted into cultural capital, embodying a Ming-Qing pattern in which merchant identity sought legitimacy through Confucian values and social mobility, aiming at a transition from wealth to recognized status.

This canal merchant expression can be summarized through three recurring dimensions, namely regional identification, the ethos of Confucian merchants, and anxiety produced by rigid status ranking. Material upgrading, such as brick masonry replacing adobe, supports explicit wealth signaling, while the "outer plain, inner refined" logic enacts the ideal of concealing wealth through a restrained public façade. In a broader Yellow River cultural framework, the Zhujia Courtyard demonstrates how ecological adaptation, ritual order, and merchant culture can operate together as an integrated architectural logic. It therefore offers a southwestern Shandong pattern that contributes to a wider spectrum of regional courtyard traditions across the Yellow River Basin.

Yellow River Civilization

Ecological wisdom rooted in Yellow River civilization provides the Zhujia Courtyard with its basis for environmental survival in the floodplain setting. The adaptive system is evident in three choices, a 60 cm-thick adobe wall that improves thermal buffering and impact resistance, a double-layer straw-reinforced mud plaster that resists moisture and stabilizes the wall surface, and a 1.8 m window-sill height that reduces backflow during flood periods. Together, these measures reflect a localized survival logic translated into vernacular building technology.

Folk Beliefs

If ecological wisdom secures the courtyard's material basis for survival, folk beliefs supply its spiritual dimension. In the spatial layout and decorative motifs of the Zhujia Courtyard, practical concerns are repeatedly interwoven with wishes for auspiciousness, safety, and lineage continuity. Decoration functions not only as visual embellishment but also as a symbolic system. Motifs operate as carriers of blessing-oriented meanings and turn architectural space into a vessel for folk practice and religious imagination.

At the level of symbolic construction, motifs form a relatively systematic expression of belief. "Five blessings" ideas are conveyed through images such as bats, deer, longevity peaches, magpies, and coins, representing aspirations for fortune, rank, longevity, happiness, and wealth. Reproductive wishes are expressed through motifs such as pomegranates, grapes, gourds, and the qilin delivering a child, signaling the desire for thriving descendants and enduring lineage. Apotropaic protection is articulated through ridge-end ornaments, stone lions at the gate, dragon motifs on door panels, and swastika motifs, which together form a symbolic defense for domestic peace.

Belief is also practiced through spatial decisions and component design that align with feng shui and ritual custom. The main gate is placed in the southeast Xun position to "gather qi" and invite auspiciousness. The screen wall serves both spatial and spiritual purposes. It blocks sightlines and separates inside from outside, while stone carvings of auspicious animals such as cranes and deer convey wishes for longevity. In the main hall, a 1.2 m-high altar table is installed for ancestral rites, reinforcing awareness of lineage continuity. The kitchen stove faces east and includes a Zaojun niche, corresponding to stove worship and to five-phase reasoning in which wood generates fire. In the West Wing Room, the absence of a rear window reflects a folk concern with preventing the

“leakage” of wealth. Stair treads are arranged in odd numbers, echoing the idea that yang numbers promote growth.

The decorative program also juxtaposes symbols associated with Buddhism, Daoism, and Pure Land belief, including guardian lions, the “Eight Immortals” in concealed form, and lotus-petal motifs. This combination reflects a pragmatic vernacular tendency toward the integration of the “three teachings”. Such symbolic fusion meets layered spiritual needs and demonstrates the inclusiveness and practice-oriented character of local belief.

Conclusion

Taking cultural heritage protection in the Yellow River Basin as the central perspective and drawing on field investigation and documentary research, this study has examined the architectural cultural characteristics and value of the Zhujia Courtyard in Shan County. At the tangible level, its Boji-cha form integrates Confucian ritual order with regional practice. Its five-purlin post and lintel construction, the zhuojie-jialong waterproofing technique, and the combination of thick walls and high windows demonstrate adaptive responses to the floodplain environment. The “three carvings”, with their diverse motifs, provide a direct expression of official-and-merchant identity and aesthetic orientation.

At the interpretive level, these features converge as an organic integration of Confucian ethics, canal-merchant culture, ecological wisdom rooted in Yellow River civilization, and folk belief. The courtyard thus functions as a compact repository of northern social structure and cultural temperament in the Ming-Qing period. As a representative surviving example of official-and-merchant courtyards in southwestern Shandong within the Yellow River Basin, it provides a practical reference case for regional architectural-cultural research and for conservation and adaptive reuse.

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