

Shibanyan Traditional Village in Linzhou, Henan: The Local Wisdom and Educational Literacy for Sustainable Development

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ABSTRACT

This study examines the sustainable development of Shibanyan, a traditional village in Linzhou, Anyang, Henan, through the dual lenses of local wisdom and educational literacy. The research highlights the community's innovative construction techniques and resource management practices, deeply embedded in their accumulated practical experience. By utilizing locally available natural resources, these practices address challenges related to habitation, environmental adaptation, and resource efficiency with minimal material and technological inputs. The adaptive methods mitigate adverse climatic impacts and foster a stable and comfortable indoor microclimate, showcasing the harmonious integration of indigenous knowledge with environmental sustainability. Furthermore, the study emphasizes the importance of educational literacy in transmitting and evolving these traditional practices for future generations. The findings reveal how community-driven strategies, supported by an emphasis on learning and knowledge-sharing, contribute to the long-term viability of traditional settlements. This research provides valuable insights into leveraging local wisdom and education to address global sustainability challenges in localized contexts.

Key words: Shibanyan Traditional Villages, Local Wisdom, Educational Literacy, Sustainable Development

INTRODUCTION

Shibanyan Town is located in Linzhou, Anyang, Henan Province, in the Nan Taihang Gorge, 22 kilometers northwest of Linzhou. It administers 17 administrative villages, including nine national-level traditional villages and three provincial-level traditional villages, which account for 71% of the total number of administrative villages. This area is the core region where traditional villages in the Nan Taihang area are concentrated. In 2017, Shibanyan Town was selected as one of the second batch of national-level characteristic towns.

The traditional villages of Shibanyan were mainly established and preserved before the Republic of China. These villages' material heritage, such as architecture, and intangible cultural heritage, such as customs and traditions, fully reflect the historical landscape, local characteristics, and ethnic customs of the villages during specific historical periods. These villages possess significant historical, cultural, scientific, artistic, economic, and social value. In October 2006, the Chinese government proposed the construction of a harmonious socialist society, a primary ideological and ambitious goal following the 1994 "China 21st Century Agenda." This was intended to promote coordinated and sustainable development across economic, social, resource, environmental, population, and educational sectors. This provided clear

guidance and strong support for research on the sustainable development of the built environment. Therefore, villages that continue to serve the lives of residents or contribute to sustainable development should be preserved and passed on.

In contrast to modern buildings, traditional dwellings are organic products that respond to the local natural environment and utilize resources. Outstanding traditional villages have advantages in adapting to climate, utilizing resources, maintaining ecological balance, and reflecting sustainable development strategies. Over years of practice, the residents of Shibanyan villages have developed local wisdom through ingeniously designed construction techniques and methods. They have thoroughly used the local natural resources, effectively coping with the natural environment. With limited material and technological conditions, they have addressed the coordination issues related to living, environmental, and resource factors, effectively mitigating the impact of external climatic conditions on indoor environments and creating a more stable and comfortable microclimate.

Currently, China is in a period of rapid urban development, and urban construction has strongly impacted traditional settlements, especially since the 1990s. With the development of the urban and rural real estate boom, the traditional "point-to-point connection" protection model has been disrupted, and

many traditional dwellings that have stood for centuries have been abandoned. The traditional villages of Shibanyan have also become the most prominent victims of socio-economic development, gradually declining in urbanization. These changes can be categorized as follows: (i) In traditional villages with relatively well-developed transportation, residents can still use their homes usually, but due to improper development and protection measures, there is a disconnection between old and new architectural styles, leading to the destruction of many traditional village characteristics; (ii) In traditional villages with less developed transportation, most residents have moved away, leading to the deterioration of the village, the collapse of buildings, and the inability to use the structures. Even national and provincial-level traditional villages have been unable to prevent the decline, which has accompanied the loss of historical, cultural, and intangible cultural heritage.

Research Objective

The research objective of this article is to explore the integration of local wisdom and educational literacy as foundational elements for the sustainable development of Shibanyan Traditional Village in Linzhou, Henan. This study aims to analyze the village's traditional architectural practices, resource utilization, and ecological adaptations to understand how they embody sustainable principles rooted in cultural and environmental contexts. By investigating the interplay between cultural heritage, ecological sustainability, and educational engagement, the research aspires to provide actionable insights for the renewal and sustainable development of Shibanyan Village, contributing to the broader discourse on rural revitalization and ecological architecture.

METHODOLOGY

This study investigates "Shibanyan Traditional Village in Linzhou, Henan: The Local Wisdom and Educational Literacy for Sustainable Development." The research focuses on the settlements of Gaojiatai, Yifukou, Longdonggou, and Xixiangping in the Shibanyan area of Linzhou, Anyang, in northern Henan Province. This region was purposefully selected due to its well-preserved traditional dwellings and the enduring cultural practices of its inhabitants, making it a quintessential representation of rural settlements in the area. The study aims to explore the interplay between local wisdom and educational literacy to propose pathways for sustainable development.

The research engaged diverse participants, including residents, government officials, and professionals such as educators and conservationists. Residents provided valuable insights into traditional practices and indigenous knowledge systems, while government officials contributed perspectives on policy-making related to rural development. Professionals with expertise in sustainable education and cultural preservation offered a broader understanding of how local wisdom can integrate with educational literacy to advance sustainability goals. This triangulated approach ensured a comprehensive understanding of the research problem.

Data collection employed a combination of qualitative methods to capture the multifaceted nature of the study.

Semi-structured interviews, guided by research objectives, were the primary tool for eliciting detailed perspectives from participants. The interviews allowed for flexibility, enabling the exploration of emerging themes or in-depth discussions on specific topics. Structured observation forms were utilized to document behaviors, cultural practices, and architectural elements relevant to local wisdom and its educational implications. Audio-visual tools, including cameras and recording devices, facilitated the documentation of interviews and cultural activities, ensuring detailed and accurate data for retrospective analysis. Ethical considerations were paramount, with participants providing informed consent for using their responses and identities in the study.

Fieldwork was conducted across the selected villages, focusing on capturing the traditional village environment's sociocultural, educational, and physical dimensions. Data were analyzed qualitatively to identify themes related to local wisdom and its integration into educational literacy frameworks. Particular attention was given to understanding how traditional knowledge contributes to sustainability and how modern educational practices can support its preservation. This approach highlights the potential for harmonizing cultural heritage with contemporary sustainability initiatives, providing valuable insights for rural development strategies.

RESULTS

The Planning Principles of Shibanyan Traditional Village

The traditional architecture of Shibanyan Village exemplifies a harmonious integration of humanity and the natural environment, encapsulating the progression of human civilization from passive adaptation to active engagement and integration with nature. Located in the mountainous region of northern Henan, the vernacular architecture responds intricately to the region's unique geographical and climatic conditions, reflecting a profound respect for natural forces. These structures serve as functional living spaces and manifestations of cultural heritage and ecological awareness. This study examines the architectural principles of site selection, spatial organization, material utilization, and construction methodologies, highlighting their alignment with the principles of sustainable development.

The site selection principles in Shibanyan are deeply rooted in the ancient Chinese philosophy of Feng Shui, demonstrating a sophisticated understanding of environmental harmony. Settlements are carefully positioned to maximize natural energy flow, with mountain ranges at their back and water sources at their front, ensuring ecological and resource efficiency. For instance, Gaojiatai Village exemplifies an ideal alignment with Feng Shui principles, leveraging natural topography to enhance environmental stability and resource management. These site selection strategies address functional and ecological requirements and encapsulate a cultural reverence for the natural landscape.

The spatial layout of Shibanyan's traditional dwellings reveals an advanced adaptation to both environmental conditions and socio-cultural needs. Courtyard configurations, ranging from single-row units to multi-courtyard complexes, optimize

natural ventilation and sunlight exposure, creating comfortable and energy-efficient living spaces. Vegetation within courtyards, such as fruit trees and ornamental plants, contributes to ecological balance while enhancing the aesthetic and symbolic connection to nature. These spatial arrangements also reflect social hierarchies and functional considerations, transitioning seamlessly from communal zones to private spaces. The spatial design embodies a sustainable architectural ethos by conserving land and incorporating ecological principles.

The construction techniques employed in Shibanyan illustrate an adept utilization of local materials and craftsmanship. The primary use of locally sourced slate and stone highlights their superior thermal insulation, stability, and adaptability to the regional environment. Techniques such as dry-stone stacking and mortar plastering demonstrate a nuanced approach to resource efficiency and structural durability. Traditional beam-and-column frameworks, combined with the reuse of timber from older structures, reflect a sustainable construction approach, emphasizing resource conservation and preserving regional architectural traditions. These methodologies extend the lifespan of the structures while maintaining their cultural authenticity.

The utilization of natural resources in Shibanyan underscores the principles of ecological sustainability. Strategic land use prioritizes the conservation of arable land, while water management systems, incorporating natural springs, ponds, and drainage channels, address utility and environmental protection. The reliance on locally available and renewable materials, such as rice straw and timber, further exemplifies an ethos of minimal ecological impact and resource efficiency. These practices embody a sophisticated integration of traditional wisdom with ecological literacy, offering valuable insights for developing sustainable architectural practices in contemporary contexts.

The Utilization of Natural Resources in Shibanyan Village: A Model of Sustainable Practices

China's longstanding emphasis on living in harmony with nature and recognizing the finite nature of natural resources has cultivated an ecological and economic philosophy promoting moderate and timely resource extraction. This perspective, deeply rooted in pre-Qin philosophical thought, has influenced economic practices across dynasties, including the Qin, Han, Tang, and Ming eras. In the Shibanyan traditional village, this ecological awareness has evolved into a body of localized knowledge and practices. These practices focus on efficiently utilizing three critical resources—land, water, and regional materials—to fulfill the community's production and living needs while minimizing environmental impact and fostering sustainable development.

The efficient utilization of land resources in Shibanyan Village reflects a thoughtful balance between human settlement needs and ecological preservation. Settlements are strategically located on less fertile hillside areas to conserve arable land for agricultural purposes. The compact arrangement of buildings, narrow alleys, and multi-story structures exemplify space-saving strategies. A notable example is a house in Yifukou Village built in 1983, which ingeniously integrates

commercial and residential spaces within a limited area by leveraging the natural slope and elevation of the terrain.

To prevent soil erosion, traditional construction employs stone foundations that redirect surface runoff, stabilizing the hillside and promoting vegetation growth. This dual-purpose approach, seen in the enduring structures of Gaojiatai Village, reinforces ecological harmony and ensures long-term land conservation. Shibanyan Village embodies a sustainable land-use model that aligns human development with ecological balance by maximizing topographical advantages and safeguarding soil integrity.

Water management in Shibanyan Village demonstrates a sophisticated integration of traditional wisdom and practical functionality. Rooted in the principles of Feng Shui, water resources are optimally utilized to support domestic and agricultural needs. With Linlu Mountain to the north and the Luoshui River to the south, the village's positioning ensures a consistent water supply and adequate drainage. Mountain springs are diverted for domestic use while regulating rainwater, contributing to a comfortable microclimate. This natural water system exemplifies the principle of "living water flowing through the village," as observed in Gaojiatai Village.

Traditional water management techniques include gravity-driven drainage systems aligned with natural slopes, efficient diversion of mountain springs for household use, and ponds to treat wastewater. These ponds act as ecological buffers, diluting pollutants and recycling water into the environment. While simple in design, these systems effectively integrate with the natural terrain, ensuring sustainable water usage and ecological stability.

The construction practices in Shibanyan Village emphasize the sustainable use of locally sourced materials, reflecting indigenous wisdom and resourcefulness. Traditional residences, primarily built during the Ming and Qing Dynasties, employ stone, rice straw, and wood as their primary materials. These materials, categorized as natural, renewable, or recycled, are sourced from the immediate environment, reducing transportation-related resource expenditure. Stone, abundant in the region, is used extensively for its structural stability and thermal properties. Rice straw, a renewable byproduct of agricultural activities, is combined with mud to form insulating layers.

Though less readily available in large quantities, wood is often reclaimed from dismantled buildings. This practice of recycling timber components such as beams and rafters underscores a resource-conscious approach to construction. By combining functionality with environmental consciousness, the architecture of Shibanyan Village reflects a sustainable building philosophy that preserves cultural heritage while addressing modern environmental challenges.

The resource utilization practices in Shibanyan Village illustrate a deep understanding of sustainability, rooted in traditional knowledge and adapted to the local environment. By integrating efficient land use, comprehensive water management, and the rational use of materials, the village offers a compelling model of ecological architecture. These practices address the community's immediate needs and contribute to long-term environmental resilience, serving as an exemplary framework for sustainable rural development.

The Epitome of Local Wisdom and Educational Literacy in Shibanyan Village

The term “environment” encompasses natural elements such as landforms, climate, hydrology, vegetation, and fauna within a specific region. Architecture, as an integration of human ingenuity and environmental response, represents a deliberate process of utilizing and adapting to these elements. In Shibanyan Village, applying local wisdom has created sustainable and comfortable living environments without relying on artificial climate control systems. This wisdom, cultivated through generations of experience, highlights the interplay between resource management, environmental adaptation, and educational literacy, demonstrating its potential as a model for sustainable development.

The traditional architecture of Shibanyan showcases a sophisticated integration of local resources and environmental features. By utilizing abundant red slate as the primary building material and harmonizing natural elements such as mountains, water features, and vegetation, the village exemplifies “intelligent architecture” with distinct regional characteristics. Resource integration reflects a comprehensive understanding of sustainable practices, whereby multiple resources are synergized to maximize their utility in creating an efficient and expressive built environment.

From an educational perspective, this integrated resource management offers profound sustainability and ecological literacy lessons. It teaches the importance of effectively recognizing and utilizing local resources while maintaining environmental harmony. By embedding these principles in modern architectural education, future designers can be equipped to approach resource management and environmental design with a sense of responsibility and creativity, fostering innovations rooted in traditional wisdom.

The traditional villages of Shibanyan, including Gaojiatai and Yifukou, illustrate an active and creative response to the natural environment. Through site selection based on Feng Shui principles, spatial layouts that improve microclimates, and material choices that provide thermal efficiency, the architecture embodies a seamless relationship between nature and human habitation. For instance, the use of slate for its insulation properties and the strategic organization of courtyards for ventilation demonstrate traditional designs’ ability to address climatic challenges effectively.

These adaptive strategies are practical examples of how local wisdom can inform educational literacy. Incorporating such examples into curricula can help students understand the dynamic relationship between architectural design and environmental sustainability. This approach shifts the focus from merely replicating traditional forms to extracting principles that address contemporary ecological challenges, bridging the gap between tradition and innovation in architectural education.

The architecture of Shibanyan reflects an intrinsic unity between production, daily life, and ecology, forming a balanced and harmonious ecosystem. This balance is not merely a product of customary practices but a result of conscious design decisions informed by generations of environmental interaction. The village’s design philosophy, emphasizing

shading, ventilation, passive solar utilization, and the strategic use of natural topography, resonates with the ecological concept of the “unity of heaven and man.”

Incorporating this philosophy into educational literacy programs fosters a deeper understanding of cultural heritage and ecological stewardship. Emphasizing the integration of resources and environmental adaptation can encourage students and professionals to approach architecture as a medium for cultural continuity and sustainable development. This shift underscores the importance of viewing architectural education as a technical discipline and a platform for instilling ecological and cultural awareness.

The traditional design wisdom of Shibanyan exemplifies how resource-efficient, environmentally responsive solutions can surpass the performance of modern mechanical systems in simplicity and cost-effectiveness. These principles, rooted in the efficient use of local materials such as stone, wood, and earth and strategies like passive solar design and optimal site selection, provide a rich foundation for sustainable development education. The conservation-oriented mindset embedded in these practices offers valuable insights for integrating sustainability into modern architectural curricula.

By framing local wisdom as a cornerstone of educational literacy, the practices of Shibanyan Village can inspire a new generation of architects to design solutions that honor cultural heritage while addressing the urgent demands of environmental sustainability. This approach ensures the preservation and renewal of traditional villages and advances the global discourse on sustainable architectural practices.

DISCUSSION

The discussion underscores the profound significance of Shibanyan Village’s traditional architecture as a model of sustainable practices and educational literacy. Rooted in a deep respect for local wisdom and ecological harmony, the village’s design principles, including site selection, spatial organization, and material utilization, reflect a sophisticated integration of environmental and cultural awareness. By aligning with Feng Shui principles, employing locally sourced materials like slate and reclaimed wood, and optimizing spatial layouts for ventilation and microclimatic balance, Shibanyan demonstrates the potential of traditional architectural practices to address contemporary sustainability challenges. These practices highlight the symbiotic relationship between human habitation and natural resources, embodying the ecological concept of the “unity of heaven and man.” The adaptive strategies of Shibanyan offer valuable lessons for architectural education, emphasizing the need to extract principles from traditional designs rather than merely replicating forms. Integrating these insights into modern curricula fosters an ecological consciousness and cultural appreciation among future architects, bridging the gap between tradition and innovation. By framing Shibanyan’s design philosophy as a cornerstone for sustainable development, this discourse advocates for a paradigm shift in architectural education—positioning traditional wisdom as a vital resource for addressing global environmental challenges while preserving cultural heritage.

CONCLUSION

This research highlights the intricate relationship between traditional architecture, ecological adaptation, and cultural heritage. Shibanyan Village is a model of how human settlements can harmonize with the natural environment through the intelligent use of local resources, context-sensitive design, and community-based practices. The village's architecture reflects a deep-rooted understanding of its unique geographical and climatic conditions, demonstrating how traditional wisdom can address environmental challenges while maintaining cultural integrity.

As Shibanyan faces inevitable renewal amidst modern advancements, this study emphasizes preserving its traditional design principles and embedding them into sustainable development frameworks. By combining local wisdom with educational literacy, the village can achieve a balanced approach to modernization that respects its cultural heritage and promotes ecological sustainability. Engaging residents in the design and construction processes ensures the personalization of housing solutions and fosters a collective ecological consciousness. Moreover, integrating these principles into educational initiatives ensures the transmission of knowledge and values to future generations. Ultimately, the sustainable renewal of Shibanyan Village offers a vital example of how traditional practices can inform and enhance contemporary sustainability efforts, bridging the gap between cultural preservation and ecological resilience.

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