Evaluation of Landscape Resources and Legal Protection Boundary Setting in Xinchang County, China

Ya Li[1,2]† and **Faridah Sahari**[1,3]

[1]Faculty of Applied and Creative Art, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia
[2]Zhejiang Industry Polytechnic College, College of Architectural Engineering, 312000,
151 Qutun Road Yuecheng District, Shaoxing City, Zhejiang, People's Republic of China
[3]Institute of Creative Art and Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia
†Corresponding author: Ya Li; 20010144@siswa.unimas.my

ABSTRACT

Landscapes are vital for ecological protection and cultural heritage, facing challenges from urbanization, agricultural modernization, and climate change. By setting legal boundaries, land use can be regulated to prevent unreasonable development and ensure the sustainable use of landscapes. This paper assesses the forest, geological, aquatic, cultural, and religious relic landscape resources of Xinchang County, Zhejiang Province, using the Analytic Hierarchy Process (AHP) and fuzzy evaluation methods to quantify their protection needs. The study finds that establishing nature reserves, ecological protection red lines, and historical and cultural villages can effectively maintain ecosystem stability and biodiversity, and protect cultural heritage. Legal protection has significantly improved forest coverage and water quality in Tianmu Mountain National Forest Park and Wozhou Lake Scenic Area, while Meizhu Ancient Village and Waipo Keng Village have excelled in cultural landscape protection. However, challenges such as inadequate law enforcement, low public participation, and insufficient funding hinder the execution of legal boundaries. Recommendations include strengthening law enforcement, raising public environmental awareness, and expanding funding sources. This paper provides a scientific basis and practical guidance for the formulation and implementation of landscape protection policies, contributing to the sustainable utilization and long-term protection of landscape resources in Xinchang County and other regions.

INTRODUCTION

Importance of Landscape Protection

Landscapes are not only an essential part of environmental protection but also a key carrier of cultural heritage (Ning 2024). Globally, landscape protection faces numerous challenges, such as accelerated urbanization, agricultural modernization, and climate change. The interplay of these factors poses a collective threat to landscapes across numerous regions, elevating the risks of their degradation and potential permanent loss. Protecting landscapes is crucial for maintaining ecosystem stability and biodiversity (Mo et al. 2021). Natural elements in landscapes, such as forests, wetlands, and grasslands, play vital roles in soil and water conservation, carbon sequestration, and habitat protection.

Additionally, landscapes embody a wealth of cultural heritage, mirroring the historical, social, and cultural transformations of diverse regions. Traditional village layouts and architectural styles not only embody the lifestyle and cultural customs of residents but also demonstrate the wisdom of harmonious coexistence between humans and nature (Li et al. 2024). Therefore, landscapes not only contribute to

environmental protection but also promote cultural heritage and enhance community identity.

Role of Legal Boundaries

Legal boundaries are crucial for landscape protection. By setting and enforcing legal boundaries, land use can be effectively regulated to prevent unreasonable development and destruction, ensuring the sustainable utilization of landscapes. Many countries and regions have established legal boundaries, such as protected areas, ecological red lines, and restricted development zones, through laws and regulations to limit the intensity and purpose of land development, thereby protecting the ecological environment and landscape resources. For example, the EU's Natura 2000 directive and China's Ecological Protection Red Line policy have effectively protected large areas of natural landscapes and ecosystems through legal boundaries (Patz et al. 2004). The establishment of legal boundaries promotes the institutionalization and standardization of landscape protection, ensuring the long-term effective implementation of protective measures through clear laws and policy guidance. Legal boundaries ensure public rights to information, participation, and supervision in landscape protection, enhancing protection effectiveness and social recognition (Terra et al. 2014).

Background of Xinchang County

Xinchang County, located in southern Shaoxing City, Zhejiang Province, lies on the northern slope of the Tiantai Mountains, known for its scenic beauty. The county has a long history and rich cultural heritage. Its unique geographical position endows the region with distinctive natural landscapes and abundant cultural landscape resources. The county borders Ninghai and Fenghua to the east, Tiantai to the south, Pan'an and Dongyang to the southwest, and Shengzhou to the northwest. The terrain mainly consists of low mountains and hills, with low mountains in the east, hilly terraces in the center, and river valleys and low hills interspersed in the northwest. Influenced by a subtropical monsoon climate, Xinchang has four distinct seasons and a mild and humid environment conducive to biodiversity. The county's water resources are abundant, with rivers like the Chengtan River, Xinchang River, and Huangze River providing natural advantages for hydropower development.

Xinchang's landscapes not only have high ecological value but also carry rich cultural connotations (Zhang 2022). Natural scenery represented by Tianmu Mountain and cultural landscapes represented by traditional villages together form Xinchang's unique landscape system. These landscapes attract numerous tourists and are an integral part

of local residents' lives and culture. In recent years, Xinchang has accumulated some experience in landscape protection but has not formed a systematic mechanism for landscape resource protection (Chun 2023).

Research Objectives

This study aims to collect data on Xinchang's landscape resources through literature analysis and field surveys to clarify their value and analyze and quantify the protection needs of these resources based on collected data. After identifying and classifying landscape resources, the study will set legal boundaries such as nature reserves, ecological protection red lines, and historical and cultural villages based on their value to ensure sustainable utilization and protection of landscape resources. It will analyze the effectiveness of legal boundaries in limiting unreasonable development, protecting the ecological environment, and preserving cultural heritage, and propose optimization suggestions to enhance the effectiveness of legal boundaries, providing scientific basis and practical guidance for Xinchang County and other regions.

MATERIALS AND METHODS

Literature Review

To systematically review and analyze relevant domestic and international literature on landscape protection and legal boundary setting, this study searched keywords such as "legal boundaries" and "landscape protection" in databases like CNKI, Web of Science, and Google Scholar. The authors included 80 highly relevant and representative papers (Table 1). These papers provide a theoretical foundation and practical experience for this study, which can be broadly categorized into four types:

Legal Boundary Setting: Research on legal boundary setting focuses on how to delineate and protect key ecological areas through scientific methods and legal means (Holder 1999). The EU's Natura 2000 directive is a typical case, limiting land development intensity through protected areas to protect ecological environments and landscape resources (Paracchini & Capitani 2011). Additionally, Sarah Blandy & Sibley (2010) explored how legal boundaries form legally significant spaces at different spatial scales, providing international experience and a scientific basis for Xinchang's legal boundary setting.

Legal Boundary Enforcement: Effective enforcement of legal boundaries requires strong law enforcement mechanisms and public participation (Holder 1999). Desideri (2015) pointed out that while setting legal boundaries is important, effective enforcement is crucial and requires

strong law enforcement mechanisms and broad public participation. Jennifer Nedelsky (1990) studied the role of legal boundaries in protecting personal freedom and property rights, emphasizing the importance of legal boundary enforcement. These studies highlight the challenges in legal boundary enforcement, including insufficient law enforcement and low public participation.

Landscape Protection: Landscape protection plays an important role in environmental protection and cultural heritage. Górka (2016) studied the legal and practical aspects of landscape protection in Poland, emphasizing the crucial role of law in maintaining landscapes. O'Donnell (2016) discussed landscape mosaic and edge effects in forest protection, providing specific cases of landscape protection. These papers emphasize that protecting landscapes not only helps ecological environmental protection but also promotes cultural heritage and community identity enhancement.

Policy and Governance: Research on policy and governance explores how effective policy frameworks and governance mechanisms promote landscape protection.

Table 1: Literature Review.

Literature Classification	Author(s) and Year	Title Primary	Viewpoints	Role in This Study
Establishment of Legal Boundaries	Blandy & Sibley (2010)	Law Boundaries and the Production of Space	Discuss how legal boundaries form legally significant spaces at different spatial scales.	Provides the theoretical foundation and practical experience for establishing legal boundaries.
Establishment of Legal Boundaries	Lindahl (2010)	A-Legality: Postnationalism and the Question of Legal Boundaries	The study examines issues related to legal boundaries in the context of post-nationalism, emphasizing the necessity of legal boundaries within the legal order.	Provides the importance and basis for establishing legal boundaries in the context of globalization.
Establishment of Legal Boundaries	Nedelsky (1990)	Law Boundaries and the Bounded Self	The study explores the role of legal boundaries in protecting individual freedom and property rights.	Emphasizes the importance of establishing legal boundaries for the protection of individual rights.
Enforcement of Legal Boundaries	Purcell & Nevins (2004)	Pushing the boundary: state restructuring state theory and the case of U.S.–Mexico border enforcement in the 1990s	The study examines issues of state restructuring in the enforcement of the US-Mexico border during the 1990s.	Provides case analysis of challenges faced during the enforcement of legal boundaries.
Enforcement of Legal Boundaries	Paul (2018)	Legal Challenges of International Environmental Law Enforcement on Transnational Boundary Pollution	The study analyzes the legal challenges in the enforcement of international environmental law concerning transboundary pollution.	Emphasizes the transnational challenges and the importance of enforcement mechanisms in the execution of legal boundaries.
Enforcement of Legal Boundaries	Chang et al. (2024)	Legal or Illegal —Transferring jurisdiction in the course of maritime law enforcement	The study examines issues of jurisdictional transfer in the enforcement of maritime law.	Provides issues of jurisdiction and practical challenges in the enforcement of legal boundaries.
Landscape Protection	Górka (2018)	Threats to Landscape and Its Protection in Poland	The study describes the prerequisites for landscape protection in Poland and the threats it faces.	Provides legal and practical insights into landscape protection, serving as a reference for this study.
Landscape Protection	Zhang et al. (2015)	Landscape Approaches for Rural Environment Protection and Management	The study explores landscape approaches to rural environmental protection and management.	Provides methodological support for landscape protection and management.
Landscape Protection	Dai & Lu (2019)	Protection and Construction Strategy of Rural Landscape Based on Regional Perspective	The study examines landscape protection strategies in Wuling Town, Hunan Province.	Provides landscape protection strategies and practical experiences from a regional perspective.
Policy and Governance	Buizer et al. (2015), van Oosten et al. (2021)	Landscape governance as policy integration 'from below': A case of displaced and contained political conflict in the Netherlands	The study explores landscape governance practices in the Netherlands, highlighting the importance of local governance in environmental protection.	Provides case analysis of policy integration and local governance.
Policy and Governance	Kusters et al. (2018), van Oosten et al. (2021)	Capable of governing landscape restoration? Exploring landscape governance capabilities based on literature and stakeholder perceptions	The study examines the governance capacity for landscape restoration, analyzing the role of multiple stakeholders in landscape governance.	Provides theoretical support for landscape governance capacity and multi-stakeholder collaboration.

Buizer et al. (2015) explored landscape governance practices in the Netherlands, demonstrating the importance of local governance in environmental protection. Kusters et al. (2018) studied landscape restoration governance capabilities, analyzing the role of multiple stakeholders in landscape governance.

The literature review conducted has not only offered theoretical backing for the development and enforcement of landscape conservation policies in Xinchang County, but it has also enriched the theoretical underpinnings of this study by integrating findings and practical experiences from both domestic and international research. Spanning a wide array of topics, from the fundamental principles of landscape ecology to concrete examples of legal boundary implementation and from the preservation of local traditional knowledge to the management of landscape resources on a global scale, these documents have helped establish a multifaceted and interdisciplinary theoretical framework for this research. By thoroughly analyzing this body of literature, the study is able to draw on the successes and shortcomings in landscape resource assessment and legal boundary establishment from various regions, offering tailored recommendations for the specific context of Xinchang County. This academic foundation not only aids in objectively evaluating the current state of landscape resources in the county but also provides a basis for setting and adjusting legal boundaries in response to the evolving socio-economic and ecological landscape.

Area Selection

The study selected Xinchang County as the research object due to its diverse landscape characteristics and accumulated experience in landscape protection. Xinchang's geographical position and natural environment provide rich research data; its economic structure and social development are also representative, providing a good practical basis for studying the role of legal boundaries in landscape protection. Given the abundance of landscape resources in Xinchang, the authors chose representative landscape resource clusters within the county, including Tianmu Mountain National Forest Park, Wozhou Lake National Natural Protection Scenic Area, Meizhu Ancient Village, and Waipo Keng Village, as data collection samples. In addition to these four representative landscape resource clusters, other well-known sites within the county were also surveyed.

Through investigation, the landscape resources of Xinchang can be broadly categorized into five main types: forest landscapes, geological landscapes, water landscapes, cultural landscapes, and religious relic landscapes. Among the forest landscapes, Tianmu Mountain stands out with its majestic mountain terrain and rich vegetation, creating a magnificent natural panorama. The geological landscapes are best represented by the Chuanyan Nineteen Peaks and the National Petrified Wood Geological Park. The Nineteen Peaks are a series of interconnected mountains stretching for 2.5 kilometers, characterized by lush trees on the mountains and crystal-clear streams at their base. The central peak features a circular hole that allows passage from east to west, thus the name Chuanyan Nineteen Peaks. The Xinchang National Petrified Wood Geological Park is a significant site for displaying Earth's history and geological evolution, containing abundant fossil resources. In terms of water landscapes, Wozhou Lake Scenic Area, Chengtanjian, and Xinchang River, along with their associated reservoirs, streams, and waterfalls, offer visitors a variety of water-based activities and scenic experiences. The cultural landscapes, such as the stone carvings and inscriptions on Tianmu Mountain and the ancient buildings in Meizhu Village, bear witness to the rich historical and cultural development of the
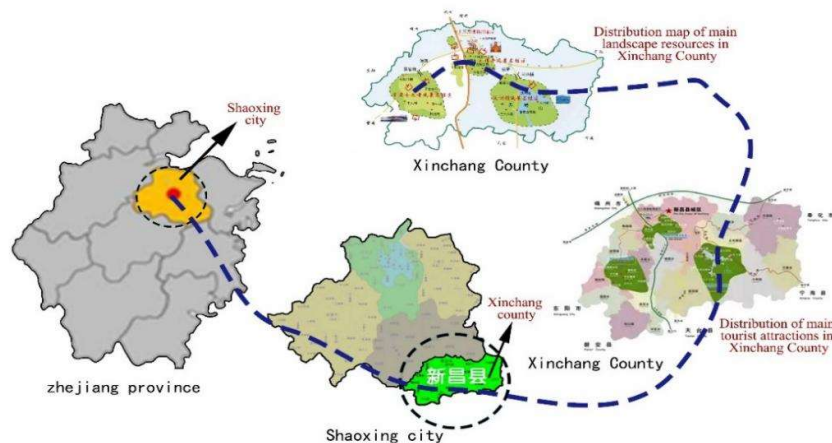

Fig. 1: The geographical location of Xinchang County and the distribution of its main scenic resources.

Xinchang region. The religious relic landscapes, including temples like Dafo Temple and Zhenjun Temple, attract numerous devotees and tourists with their long histories.

These landscape resources not only possess natural beauty but also embody profound cultural significance. In recent years, through scientific planning and reasonable management, the landscape resources of Xinchang County have gradually become a crucial force in promoting local economic development, enhancing residents' quality of life, and facilitating cultural exchange (Fig. 1).

Data Collection

To comprehensively understand the landscape resources of Xinchang, the authors conducted field surveys from February to August 2024 at Tianmu Mountain National Forest Park, Wozhou Lake National Natural Protection Scenic Area, Meizhu Ancient Village, and Waipo Keng Village. To authentically reflect the beauty of landscape resources and strengthen comparisons between landscape resources, numerous photos were taken at each site following specific guidelines. Photos were selected based on three principles: (1) ensuring representativeness, (2) avoiding non-landscape factors, (3) maintaining consistent shooting conditions (Fig. 2).

Through field surveys, landscape resources were categorized into five types: forest landscape resources, geological landscape resources, water landscape resources, human landscape resources, and religious relics landscape resources. Human landscape resources refer to valuable landscapes created by human activities, such as architectural relics, historical towns, celebrity residences, and regional culture (Mo et al. 2021). Many scholars' landscape evaluation studies show that evaluators from different groups or cultural backgrounds do not have significant statistical differences in aesthetic attitudes (Buhyoff et al. 1984, Tips & Savasdisara,1986). Therefore, during the field surveys, 50 participants, including villagers, tourists, and managers from the above areas, were randomly recruited for evaluation. Fuzzy evaluation was used for assessment. Evaluators rated each indicator on a five-point scale and provided an overall evaluation of each site. Then, evaluation forms were collected, and membership degrees and scores for each indicator at each site were calculated. Finally, the total score for each site was calculated based on the evaluation system.

The fuzzy score Q_i of each evaluation indicator was calculated as follows:

$$Q_i = \sum_{a=1}^{5} r_{ia} \times a \ (a = 1, 2, 3, 4, 5)$$

r_{ia} is the score membership degree of each indicator, a is the score grade, and the calculation method of membership degree r_{ia} was as follows:

$$r_{ia} = \frac{m}{M} \ (i = 1, 2.3, \ldots, n; a = 1, 2, 3, 4, 5)$$

Data Analysis

The data used AHP to establish the structural model for landscape resource evaluation (Ovchinnikova et al. 2021) and then applied comparative judgment to layer the typical landscape resources of Xinchang County (Balta & Atik 2022), resulting in the landscape resource evaluation results for Xinchang County. Finally, the overall scores for landscape resources were obtained. Based on field surveys and literature reviews, an evaluation system for Xinchang's landscape resources was established. The evaluation system

Fig. 2: Partial photos of 6 evaluation sites. A01 Tianmu Mountain National Forest Park, A02 Wozhou Lake National Natural Protection Scenic Area, A03 Meizhu Ancient Village, A04 Grandma Keng Village.

Table 2: The evaluation system of landscape resources of Xinchang County.

Objective Level	Criterion Level	Weight	First-level Indicator	Weight
Xinchang County Landscape Resource Evaluation System	B1 Forest Landscape Resources	0.3000	C1 Tree Morphology	0.1200
			C2 Tree Distribution Pattern	0.1800
			C3 Canopy Density	0.2000
			C4 Forest Perspective	0.1600
			C5 Coordination of Shrubs and Grasslands	0.1600
			C6 Uniformity of Shrubs and Grasslands	0.1800
	B2 Geological Landscape Resources	0.2500	C7 Terrain Variation	0.3000
			C8 Slope	0.2500
			C9 Vegetation Coverage	0.4500
	B3 Water Landscape Resources	0.2000	C10 Waterbody Morphology	0.4000
			C11 Waterbody Openness	0.3000
			C12 Waterbody Transparency	0.3000
	B4 Cultural Landscape Resources	0.1500	C13 Landscape Aesthetic Value	0.2500
			C14 Landscape Uniqueness	0.2500
			C15 Historical and Cultural Value	0.3000
			C16 Popular Science Value	0.2000
	B5 Religious Relic Landscape Resources	0.1000	C17 Religious Cultural Value	0.5000
			C18 Religious Architectural Aesthetics	0.3000
			C19 Pilgrimage Tourism Attraction	0.2000

includes five criteria: forest landscape resources, geological landscape resources, water landscape resources, human landscape resources, and religious relics landscape resources. The following is the specific evaluation system of Xinchang County and the weight of each indicator (Table 2).

RESULTS

Landscape Resource Evaluation Results

Using AHP and fuzzy evaluation methods, this study systematically evaluated Xinchang's landscape resources and analyzed the impact of legal boundary settings on landscape resource protection. Tables 2 and 3 show the scores and comprehensive evaluation results of typical landscape resource clusters in Xinchang County. The results indicate that Tianmu Mountain National Forest Park performs best in forest and geological resources, while Wozhou Lake National Natural Protection Scenic Area excels in water and religious resources. Meizhu Ancient Village has a strong comparative advantage in human resources, while Waipo Keng Village has weaker comparative advantages among the four sites.

From the scores of various landscape resources in Table 3 and Table 4, it can be observed that Tianmu Mountain National Forest Park (A01) in Xinchang County has the highest total score. This is mainly attributed to the high scores of its forest landscape resources (B1) and geological landscape resources (B2), both of which reach a score of 4. In A01, visitors can enjoy the majestic Tianmu Mountain range and abundant forest resources, which significantly enhance the overall value of the scenic area. Additionally, A01's cultural landscape resources (B4) also score relatively high, primarily due to its location at an important node on the Tang Poetry Road in eastern Zhejiang. Many poets of the Tang Dynasty, such as Li Bai, Du Fu, and Bai Juyi, visited this area, leaving behind numerous poems and former residences. However, there is still room for improvement in the cultural landscape resources of A01, particularly in terms of increasing cultural activities and tourism facilities.

In contrast, Wozhou Lake National Natural Protected Scenic Area (A02) scores highest in water landscape resources (B3) and religious relic landscape resources (B5). The water landscapes of A02, such as lakes and rivers, along with religious temples like Shanchan Temple and Zhenjun Temple, attract a considerable number of visitors. Its forest

landscape resources (B1) also score relatively high. However, A02 scores lower in cultural landscape resources (B4), indicating the need for further development and protection of its historical and cultural heritage.A03 (Meizhu Ancient Village) scores highest in cultural landscape resources (B4), showcasing its rich cultural history and traditional architecture. Its water landscape resources (B3) also score well, reflecting good water quality and waterbody morphology. A02 (Waipo Keng Village) has balanced scores in forest landscape resources (B1) and cultural landscape resources (B4), demonstrating an overall good ecological and cultural environment. However, there is still room for improvement in geological landscape resources (B2) and other aspects.

From these evaluation results, it can be seen that different landscape resources in Xinchang County are distributed and perform variably across different scenic areas. Tianmu Mountain National Forest Park excels in forest and geological resources, while Wozhou Lake National Natural Protected Scenic Area stands out in water and religious resources. Meizhu Ancient Village has a strong comparative advantage in cultural resources, and Waipo Keng Village maintains a good status in both forest and cultural resources. These data provide scientific evidence and practical guidance for the protection and management of landscape resources in Xinchang.

Legal Boundary Setting

Based on the above research, this paper finds that Xinchang County can establish three types of legal boundaries: nature reserves, ecological protection red lines, and historical and cultural villages (Wei et al. 2024). These legal boundaries are primarily based on ecological and cultural values to protect key natural and cultural landscape areas. Nature reserves mainly include areas such as Tianmu Mountain National

Forest Park, Wozhou Lake Scenic Area, and Chuan Rock Nineteen Peaks, which are dominated by natural landscape resources. These areas protect rich natural landscapes and biodiversity through legal boundaries, limiting human activities that damage ecosystems.

Ecological protection red lines cover the county's main rivers, wetlands, and forest areas, focusing on ecological environment protection. By setting ecological red lines, human activities in these areas are restricted, ensuring the stability of water resources and wetland ecosystems. For river and wetland protection, the ecological red lines cover major rivers like Chengtan River and Xinchang River and surrounding wetlands, limiting development and pollution in riverine areas to protect aquatic ecosystems' health. The red lines should also cover the Tianmu Mountain range and other forest areas within the county, with legal prohibitions on large-scale logging and development activities, protecting the ecological functions and biodiversity of forests.

Historical and cultural villages like Meizhu Ancient Village and Waipo Keng Village need laws and regulations to protect their traditional buildings and cultural heritage. Legal boundaries not only protect the physical structure of historical buildings but also preserve their social value (Przybyszewski et al. 2022). Legal boundaries prevent modernization projects from damaging the traditional landscape of ancient villages, promoting cultural heritage transmission and protection.

Landscape Protection Inside and Outside Legal Boundaries

Comparing data from typical landscape resource clusters within Xinchang County, such as Tianmu Mountain National Forest Park (A01), Wozhou Lake National Natural Protection

Table 3: Index System Evaluation of Xinchang County.

No.	Scenic spot	Type of landscape resources					Total score
		B1 Forest Landscape Resources	B2 Geological Landscape Resources	B3 Water Landscape Resources	B4 Cultural Landscape Resources	B5 Religious Relic Landscape Resources	
1	Tianmu Mountain Forest Park (A01)	4	4	3	4	3.65	3.73
2	Wozhou Lake Scenic Area (A02)	3.6	3.7	4	3	4	3.66
3	Meizhu Ancient Village (A03)	3.2	3.3	3.75	3.1	2.9	3.25
4	Waipo Keng Village (A04)	2.8	2.9	2.8	4	3.2	3.14

Table 4: A Comprehensive Evaluation of Xinchang County.

No.	Location	Excellent (5)	Good(4)	Average (3)	Poor (2)	Very Poor (1)	Total Score
1	Tianmu Mountain Forest Park (A01)	0.3	0.4	0.2	0.05	0.05	4
2	Wozhou Lake Scenic Area (A02)	0.25	0.35	0.25	0.1	0.05	3.75
3	Meizhu Ancient Village (A03)	0.2	0.25	0.3	0.15	0.1	3.45
4	Waipo Keng Village (A04)	0.15	0.3	0.35	0.1	0.1	3.35

Scenic Area (A02), Meizhu Ancient Village (A03), and Waipo Keng Village (A04), reveals that setting legal boundaries around these areas can significantly limit unreasonable development, protect the ecological environment, and preserve cultural heritage. Areas within legal boundaries show significantly higher forest coverage, water quality, and biodiversity than areas outside boundaries. Legal boundaries play a crucial role in these scenic areas. Typical landscape resource clusters within Xinchang County, such as Tianmu Mountain National Forest Park and Wozhou Lake National Natural Protection Scenic Area, effectively curb illegal development activities through legal boundary protection, preserving their rich natural landscape resources. Historical and cultural villages like Meizhu Ancient Village and Waipo Keng Village protect traditional architectural heritage and unique cultural landscapes through legal boundaries.

Challenges Facing Legal Boundaries

Past experiences indicate that the implementation of legal boundaries may face challenges such as inadequate law enforcement, low public participation, and insufficient funding. Due to insufficient law enforcement and supervision in some areas, illegal development and destruction still occur. During the survey, villagers mentioned that illegal logging and construction still exist in some protected areas, damaging the local ecological environment. Despite the government's efforts to promote community participation in landscape protection, many residents lack awareness of its importance and show low enthusiasm for participation. Only about 40% of respondents reported participating in related activities.

Additionally, landscape protection requires sufficient funding, but due to limited fiscal budgets, protection projects are difficult to fully implement. Several respondents indicated that landscape protection funds mainly rely on government appropriations, lacking diversified funding sources, limiting the effectiveness and sustainability of protective measures. Therefore, to effectively protect landscape resources, it is necessary to strengthen law enforcement, raise public awareness, and expand funding channels (Jiahua 2023), ensuring the smooth implementation of landscape protection projects.

DISCUSSION

Through this study's systematic evaluation of Xinchang's landscape resources and the setting of legal boundaries, the urgency and key role of legal boundaries in Xinchang's landscape resource protection can be clarified. First, the establishment of legal boundaries can effectively protect the local natural and cultural landscape resources, limit unreasonable development behaviors, and maintain ecosystem stability and biodiversity (Yermolenko et al. 2021). Legal boundary protection has effectively maintained forest coverage and water quality in areas such as Tianmu Mountain National Forest Park and Wozhou Lake National Natural Protection Scenic Area, alleviating or curbing environmentally destructive behaviors. Of course, legal boundaries may still face challenges, such as inadequate law enforcement and low public participation during implementation, which can be quite acute in some areas.

Secondly, public awareness and participation in landscape protection significantly influence the effectiveness of legal boundaries. Some residents lack awareness of the importance of landscape protection and show low participation enthusiasm, affecting the protection effect of legal boundaries to some extent. Areas within legal boundaries perform significantly better in environmental protection and cultural heritage maintenance than areas outside boundaries, mainly due to the restrictive role of legal boundaries. However, to further enhance protection effectiveness, it is necessary to strengthen public environmental awareness and participation. The government and relevant departments should intensify publicity and education efforts to raise residents' awareness of landscape protection and encourage more people to participate in landscape protection work. Meanwhile, the establishment and implementation of legal boundaries require more funding to ensure the effective implementation of protective measures. Therefore, it is recommended that the government prioritize funding needs for landscape protection projects in fiscal budgets to ensure orderly protection work. Through these measures, the actual effectiveness of legal boundaries in landscape protection in Xinchang County can be further improved, providing strong support for achieving sustainable development goals.

Additionally, to thoroughly discuss landscape protection in Xinchang County, the researchers conducted a comparative study with Shengxian City, which faces similar landscape challenges. Bordering Xinchang County, Shengzhou City also boasts a wealth of natural scenery and a profound cultural heritage. Through this comparison, it became evident that the landscape resources in Xinchang County demand a more explicit establishment of legal boundaries, especially considering the high susceptibility of its important scenic areas, such as Tianmu Mountain and Wozhou Lake, to tourist influence and agricultural activities. Consequently, stricter legal boundaries are required to safeguard its natural resources. In contrast, Shengzhou City has achieved notable success in the protection of cultural landscape heritage, yet there remains room for improvement in the protection of natural landscapes.

This study also examined Lijiang City in Yunnan Province, which, despite differences in geographical location and climatic conditions compared to Xinchang County, offers valuable insights into the protection of both cultural and natural landscape resources. Lijiang City has implemented legislation to protect its ancient city, restrict commercial development, and actively promote cultural tourism, thereby preserving its cultural heritage while also stimulating local economic growth. These experiences provide significant guidance for Xinchang County on how to balance tourism development with the protection of cultural heritage while safeguarding natural landscapes.

CONCLUSIONS

This study reveals the critical role and impact of legal boundaries in the landscape protection of Xinchang County through the evaluation of typical landscape resources and the establishment of legal boundaries. The study shows that rational evaluation of the advantages and disadvantages of landscape resources within the region and the establishment of legal boundaries can effectively protect the natural and cultural landscape resources of Xinchang County, limit unreasonable development behaviors, and promote the sustainable development of the ecological environment and the protection of cultural heritage. The study also finds that strengthening law enforcement and public participation is key to further enhancing the protection effectiveness of legal boundaries. By raising public environmental awareness and increasing funding for landscape protection projects, the protection goals of legal boundaries can be better achieved. The study's findings provide a scientific basis and practical guidance for Xinchang County and other regions in formulating and implementing landscape protection policies, offering new perspectives for the long-term protection and sustainable utilization of landscape resources in Xinchang County.

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