

# Livelihood transformation from fishing to tourism: an adaptive sustainable livelihood framework for understanding lakeside communities of China

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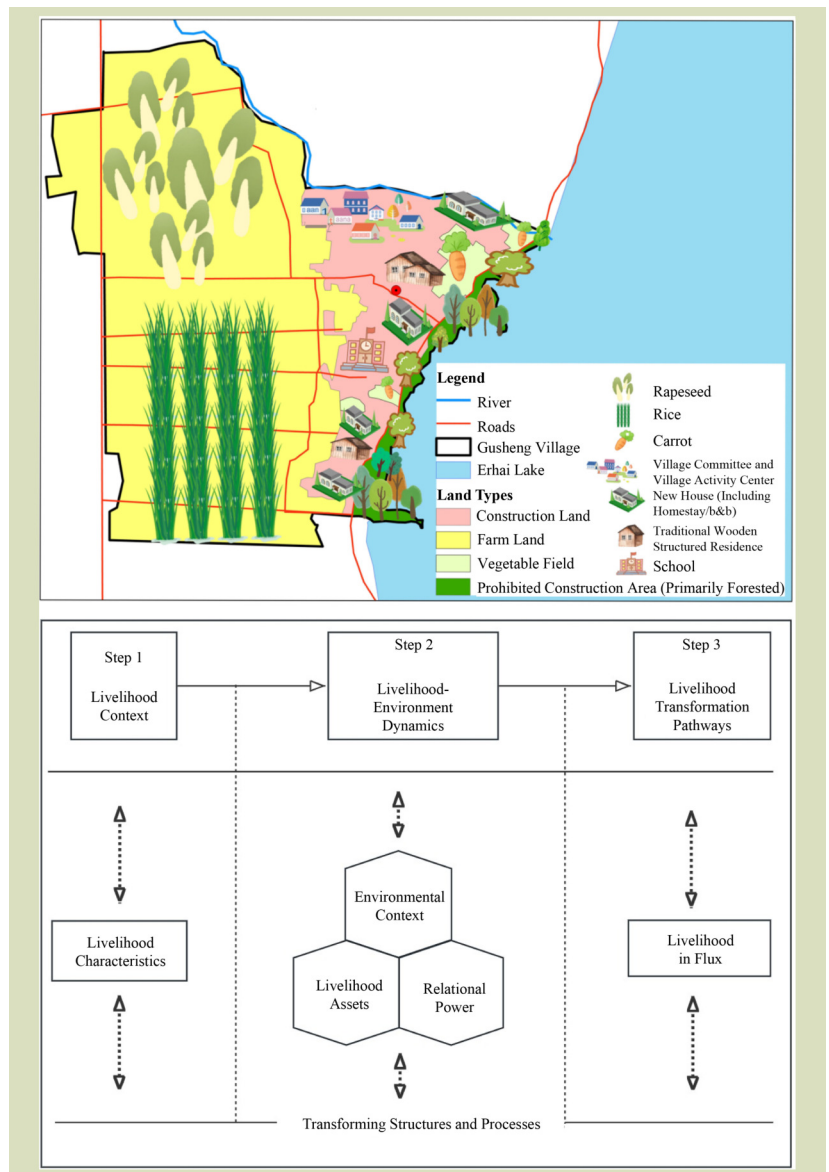
## KEYWORDS

Lakeside community, livelihood transformation, fisheries, tourism, China

## HIGHLIGHTS

- A specific examination of the livelihood transition within a lakeside community in China was undertaken.
- The analysis centered on examining the process of livelihood changes from both institutional and action perspectives.
- Improving locals' physical assets in tourism development can boost their property-based income and facilitate sustainable transformation.
- The analysis highlighted the crucial role of human capital in the livelihood transition process, emphasizing the significance of talent and innovative models in ensuring its sustainability.

## GRAPHICAL ABSTRACT



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## ABSTRACT

Fisheries in coastal and lakeside regions are increasingly facing sustainability challenges. This predicament has compelled these regions to shift toward economic diversification, with tourism emerging as a feasible alternative economic activity. This study focuses on a rural community adjacent to Erhai Lake in Dali City, Yunnan Province, China, examining its shift from a fishing-based economy to tourism over several decades. Employing an adaptive sustainable livelihood framework, this study assessed the livelihood transformation across various stages over an extended period, from both institutional and action-oriented perspectives, analyzing factors influencing sustainable livelihood transformation in lakeside communities and their subsequent effects. This research revealed several key insights. Firstly, tourism, as an alternative industry to fishing, not only faces increasingly stringent environmental protection policies but also confronts multiple challenges from the community level. Secondly, the improvement of the physical assets of locals within the tourism development, which can increase property-based income, has the potential to facilitate a sustainable transformation of their livelihoods. Thirdly, analysis identifies the pivotal role of human capital in the current transition process, with the influence of talent and innovative livelihood industry management models gaining prominence to ensure sustainability of this transformation.

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## 1 Introduction

The economy of coastal and lakeside regions has historically been based on fishing. Nevertheless, this sector is currently encountering profound sustainability challenges due to factors such as rampant overfishing, ecological degradation, and the pervasive impacts of global climate change. This predicament has necessitated a paradigm shift toward diversification of economic strategies in these regions, with tourism emerging as a prominent alternative. This shift, however, encompasses challenges such as the adaptive capacity of indigenous communities, the environmental ramifications of tourism, and the transformation of social and cultural dynamics. Concurrently, a substantial body of research advocates for the development of tourism as a strategic alternative for livelihood, with the objective of diminishing the dependency of these communities on aquatic resources. This reorientation in livelihood strategies is increasingly being recognized as a cornerstone in the evolving policy frameworks, signifying a critical departure from the traditional economic models prevalent in coastal and lakeside areas<sup>[1,2]</sup>. The transformation of livelihoods within these communities and the significant implications it carries are the focal points of our investigation<sup>[3–5]</sup>. Promoting tourism as an alternative livelihood strategy holds significant promise for coastal and lakeside communities<sup>[6–8]</sup>. However, it should be recognized that the transformation to tourism also presents challenges, including gentrification, cultural commodification, and over-tourism, which require careful management to maximize the benefits while minimizing potential risks.

The issue of livelihood transformation in coastal and lakeside areas represents a multifaceted process involving policies on

environmental protection across multiple sectors, rural development, and community actions. In the research on livelihood transformation from fishing to tourism in coastal and lakeside communities encompasses several key research aspects. These include analyzing the economic, environmental, and social implications of the transformation<sup>[9]</sup>, exploring the motivations and drivers behind this shift, and investigating the challenges and opportunities presented by the shift from traditional livelihoods to tourism-related activities<sup>[10]</sup>. Additionally, research often examines the role of policies, governance, and community engagement in facilitating or hindering this transformation<sup>[11,12]</sup>. Overall, existing research predominantly explains the process of livelihood transformation in coastal and lakeside communities from two main dimensions: institutional and action-oriented measures.

In this paper, we focus on Gusheng Village, a quintessential lakeside community located adjacent to Erhai Lake in Dali City, Yunnan Province, China. Since the establishment of the People's Republic of China (PRC), the primary livelihood of this village has been fishing. Starting from the 1990s, China initiated environmental protection measures targeting Erhai Lake, with Gusheng Village becoming the central area and the launching point for these conservation efforts. Consequently, the livelihood of Gusheng Village began to undergo fundamental changes centered around the environmental protection of Erhai Lake. Local livelihoods were directly affected by the policies protecting Erhai Lake, significantly diminishing the scope of traditional fishing activities. Notably, at the same time, community development policies such as the reclamation of farmland for lake-centric purposes and land acquisition for road construction also started to influence the modes of production and the livelihood structures of

individual families within the community. Existing research indicates that the transition from fishing to tourism as a means of livelihood entails certain risks and raises questions about sustainability<sup>[7,13,14]</sup>. Studies either concentrate on the institutional level, focusing on the impact of relevant policies and regulations on livelihoods<sup>[14,15]</sup>, or they isolate the analysis to the community level, attributing factors solely to issues related to the participation of farming households<sup>[16]</sup>. This paper aims on analyzing the key factors influencing the risks and sustainability of livelihood transformation, considering the interactive processes between institutional frameworks and actionable measures.

In the exploration of livelihood transformation, the sustainable livelihood framework (SLF) has been extensively utilized to evaluate alterations in livelihood capitals influenced by external factors. However, this framework attempts to elucidate the dynamic process of livelihood transformation and the complex background influencing this transformation have increasingly been recognized as inadequate. In recent discussions on how to improve the SLF, Natarajan et al.<sup>[17]</sup> argue that the SLF has to adopt a holistic approach characterized by structural, dynamic, and ecologically-coherent framing of rural livelihoods, in order to encompass a comprehensive historical and geographical perspective, and determine why the relative power and vulnerability of different groups evolve over time and how the actions and fortunes of one group in society influence others<sup>[17]</sup>.

In response to the dynamic process of ecological change in lakeside communities, this paper draws on the research framework proposed by Natarajan et al.<sup>[17]</sup> It analyzes the process of livelihood transformation from three aspects: environmental context, assets, and relational power. Also, the paper discusses the main factors influencing livelihood transformation, considering both institutional frameworks and actionable measures. This framework is designed to offer flexibility and adaptability, ensuring its relevance and applicability across diverse theoretical traditions in the study of the evolving process of livelihood transformation in the lakeside communities of China.

To achieve our objectives, we turn to an adaptive SLF to develop our analytical framework to observe the process of livelihood transformation in Gusheng Village, but also discuss the pathway to reduce livelihood risk from fishing to tourism. The theories and derived analytical framework of the paper are elaborated in Section 2. Section 3 introduces the research area and research methods used to produce the required data and information. The results are reported in Section 4 and Section 5 discusses our empirical findings. Section 6 is conclusions.

## 2 Theory and analytical framework

The transition of livelihoods from fishing to tourism in coastal and lakeside areas represents a process of restructuring livelihood capitals. This restructuring involves, on one hand, reducing reliance on the existing natural capital and leveraging other forms of livelihood capitals, such as physical and human capital<sup>[18]</sup>. On the other hand, it encompasses the reutilization of natural capital. However, a significant body of empirical research points out that this transformation is fraught with risks at various levels<sup>[19–21]</sup>. This includes imperfections in the design of sustainable livelihood policies at the institutional level<sup>[14]</sup>. At the community level, there is a disparity in the capacities and willingness of different farming households to participate<sup>[7,16]</sup>. The livelihood transformation also triggers a reduction in income and increases in livelihood risks<sup>[22,23]</sup>, as well as the threat posed to the local community environment by the development of the tourism industry<sup>[24]</sup>. These risks highlight that the livelihood transition from fishing to tourism is a complex and dynamic process encompassing both institutional design and community action. It also represents an interactive process of local development and environmental change. Analyzing this transition necessitates a consideration of the historical context of livelihoods and the background of environmental changes. This requires constructing a research framework that bridges the institutional and actionable levels.

The original SLF, which is widely used in explaining the livelihood transition from fishing to tourism in coastal and lakeside communities, typically divides livelihood capital into five categories, including natural capital, social capital, human capital, physical capital, and financial capital. SLA assumes the institutional processes which influences how households mobilize their capital assets<sup>[25]</sup>. However, there are increasing reflections of the SLA argue that it often overlooks the historical factors, such as colonialism and structural adjustment policies, that have shaped contemporary livelihoods, focusing primarily on the present. This neglects the understanding of how rural livelihood structures have evolved over time, requiring an exploration of the processes, policies, and mechanisms that have influenced them. In addition, the original SLF aligned with new institutional economic thinking. It positions institutions, markets, and policies, along with their role in (re)shaping livelihood options, as matters of technical rather than political concern. This leads to an oversight of the power relations among different actors and a certain extent of power asymmetry<sup>[17]</sup>.

In response to perceived limitations of the existing SLF, a noteworthy initiative was put forth in 2022 by Natarajan

et al.<sup>[17]</sup>. This initiative was originated from a critical reflection on the shortcomings of the SLF in addressing contemporary development challenges. It is recognized that the SLF, as it stood, might not adequately encompass the complexities and nuances of livelihoods in diverse contexts. Expanding upon this, Natarajan et al.<sup>[17]</sup>, proposed a significant adaptive SLF that was guided by two core principles. First, they advocated for an open and non-normative approach, emphasizing that the adaptive SLF should not take a specific ideological stance on issues such as capitalism or migration. Instead, it should acknowledge the pivotal role of capitalist relations in shaping livelihoods. Second, they aimed for a more flexible and inclusive framework, encouraging engagement from various perspectives and disciplines. Despite its roots in Euro-American traditions of thought, the adaptive framework was designed to invite further dialog and potential adjustments by individuals who bring alternative world views and knowledge systems. This initiative also aimed to reveal the struggles associated with livelihoods, facilitating radical transformation by recognizing the influence of structural and relational power<sup>[17]</sup>.

This re-envisioned SLF offers a more nuanced and comprehensive approach to understanding livelihoods. In

response to concerns about the original SLF, several key enhancements have been made. These include redefining vulnerability context to encompass both risk and opportunity, acknowledging the role of policies, norms and social groups in shaping livelihoods, and introducing the concepts of relational power, and climate and environmental context/relations<sup>[17]</sup>. The revised SLF emphasizes the dynamic interaction between livelihood assets, environmental factors and power dynamics over time. The concept of influence and access is given more prominence to explain the dynamic processes influencing livelihoods, while livelihood strategies and outcomes are recast to reflect the ever-changing and complex nature of livelihoods. Adopting the adaptation of SLF, we have set up our research framework by three steps: (1) the livelihood context in Gusheng Village, (2) the grounding livelihood-environment dynamics from fishing to tourism, and (3) the pathway to making a transformative livelihood in flux (Fig. 1).

### 3 Research methods

#### 3.1 Case selection and study area

Gusheng Village, with a history spanning over 2000 years, is a

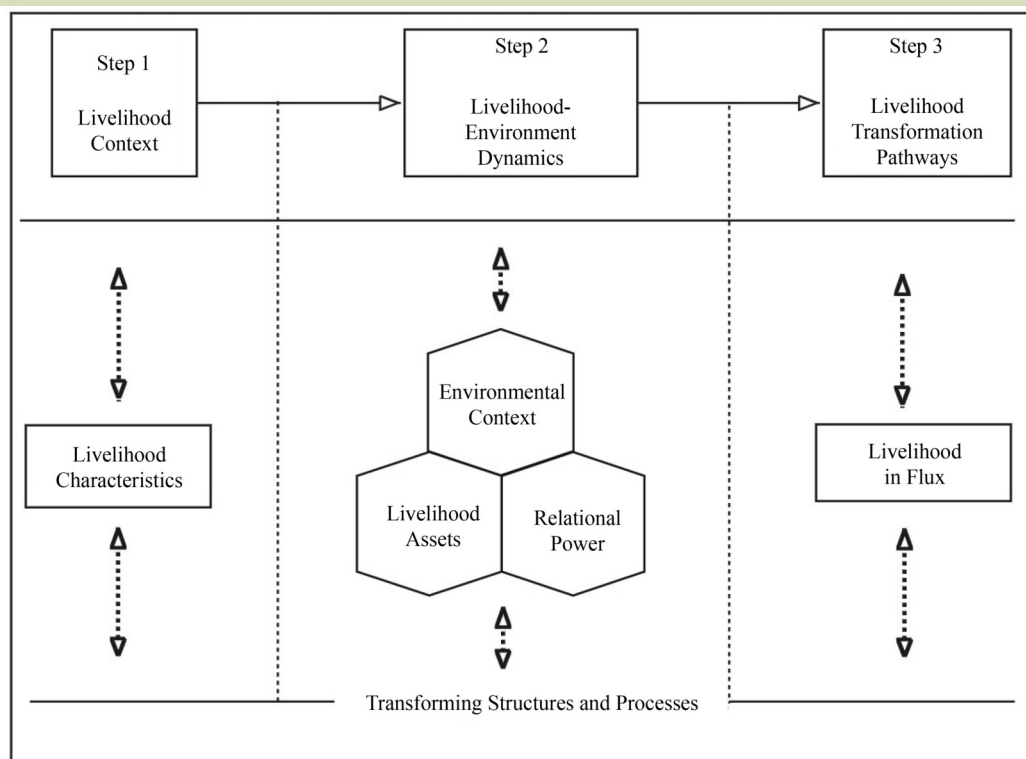


Fig. 1 Research framework. Adapted from Natarajan et al.<sup>[17]</sup> under Creative Commons.

Bai ethnic natural village situated on the Yuanyang Peninsula of Erhai Lake in Yunnan Province, China. It extends from the eastern shoreline of Erhai Lake to Dalilu Road in the west, borders Newxiyi to the south, and is adjacent to the Yangxi, one of the 18 streams of Cangshan Mountain, to the north. The linear extent of the village along the northern shores of Erhai Lake is about 1.1 km, encompassing a total residential area of 1.5 km<sup>2</sup> within a village territory of 1.54 km<sup>2</sup> (Fig. 2). The village area occupies approximately 19 ha of land. Gusheng Village is divided into five village-level administrative units, comprising a total of 446 households with a population of 1824 residents. The Bai ethnic group constitutes over 98% of the total residents.

Gusheng Village encompasses about 100 ha of arable land, resulting in an average per capita arable land area of about 0.054 ha per person. The village has an annual mean temperature of 15.7 °C, with peak temperatures reaching 28 °C and minimum temperatures dropping to 2 °C. The village receives an annual precipitation of 1078 mm, with an average annual sunlight of 2268 h, and relative humidity of 69%.

Historically, Gusheng Village has grappled with the challenge of a high population density and limited arable land, mainly engaging in the cultivation of rice, tobacco, garlic, and vegetables. In line with the imperative to preserve the ecological integrity of Erhai Lake, Gusheng Village has undertaken initiatives aimed at the establishment of an eco-efficient agriculture brand. These efforts encompass the transfer of agricultural land, the introduction of agricultural development limited liability companies, logistics and transportation companies, rice-related enterprises, and the expansion of ecological agriculture. Also, the village emphasizes the cultivation of ecological rice that reduces the use of mineral fertilizers and synthetic pesticides during the cultivation process in the spring and rapeseed in the autumn.

### 3.2 Methods and data processing

The use of an SLF required methods that capture changes caused by the livelihood transformation from fishing to tourism in livelihood capital assets. The adaptation of SLF required a detailed explanation on the environmental context

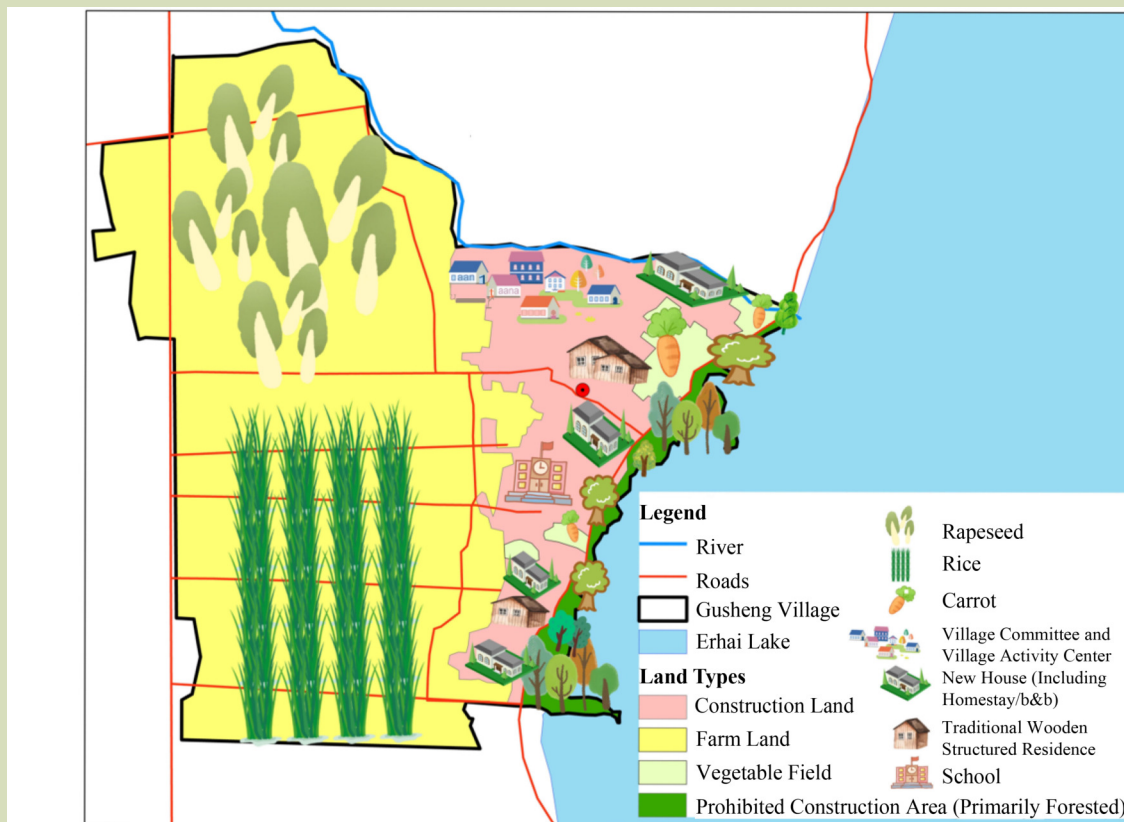


Fig. 2 Diagram of Gusheng Village livelihood, landscape, and architectural planning. Reproduced from the forestry and grass resources map issued by the China National Forestry and Grassland Administration<sup>[26]</sup> under Creative Commons.

and relational power, with the data and information collection steps that Natarajan et al.<sup>[17]</sup> suggested. We conducted face-to-face, semi-structured interviews, reviewed available documentation, and undertook field observations. We used triangulation to verify empirical findings resulting from using different methods.

Field work was undertaken from November to December 2022. This included the baseline information for the village and had a primary focus on assessing livelihood changes within Gusheng Village. This entailed examining the transformation of livelihood assets, policy factors influencing these changes, and the involvement of various stakeholders in the process of livelihood transformation.

The interviews included to 80 interviewees being local government officials, village cadres and rural households, specialists and students from university, and company employees. The interviewees were selected taking into consideration gender, age, education and changes in livelihood strategies (Table 1).

We collected documentation that contained information related to the livelihood transformation in Gusheng Village, such as documentation recording government policies related to environment protection, village rules and regulation notices, off-farm economic activities in which Gusheng Village households engaged, local statistical yearbooks, and county and village historical records.

## 4 Results

### 4.1 Livelihood context

The livelihood changes in Gusheng Village since the founding

of the PRC can be broadly divided into three phases as follows.

#### 4.1.1 The first phase: agriculture-centric (from post-PRC establishment to the 1990s)

After the founding of the PRC, Gusheng Village, like other parts of the country, underwent land reform, followed by the movement for agricultural collectivization. During the era of collectivization, grain prices were state-regulated, farmers earned work points, and the state allocated grain based on these points and population size. Similarly, before the 1980s, the consumption patterns of the Bai ethnic group were primarily focused on basic subsistence.

Following the economic reforms of 1978, the pursuit of *efficiency first* gradually became the goal among fishers. The design of fishing boats evolved toward smaller, faster, and more efficient models. The mindset of fishers shifted from fulfilling collective production tasks to seeking greater wealth. Fishery production became family-oriented and the lives of fishers individualized. Women gained more opportunities to enter society during this phase, participating in fishing, engaging in fish trade and processing aquatic products. In contrast, the contradiction of a growing population with limited land became increasingly prominent, with the newly born struggling to acquire sufficient land. Concurrently, the government vigorously implemented national expressway construction, connecting the central and western regions with the east, gradually eliminating the transportation barriers to economic development. This provided the residents of Gusheng with numerous opportunities to venture out and facilitated the inflow of external resources. Gradually, Gusheng Village began to exhibit a new socioeconomic pattern characterized by industry as primary and agriculture as secondary with diversified business operations and collective development.

**Table 1** Summary details of the interviewees undertaken during the research

| Affiliation of interviewees   | Position of the interviewees   | No. of interviewees |
|-------------------------------|--|---------------------|
| Dali Municipal Government     | Deputy Mayor and staff from functional departments related to rural revitalization | 8                   |
| Wanqiao Town Government       | Mayor and staff from functional departments related to rural revitalization        | 4                   |
| Gusheng Village               | Village cadres   | 6                   |
|                               | Residents in the village who have not worked outside                               | 37                  |
|                               | Migrant workers returning to their hometown villages                               | 9                   |
|                               | People from the neighboring village  | 3                   |
| China Agricultural University | Specialists and students   | 11                  |
| Agricultural Companies        | Company employees  | 2                   |

#### 4.1.2 The second phase: combining farming and off-farm work (from the 1990s to 2017)

The second phase, spanning from the 1990s to 2017, witnessed a transformation from solely farming and fishing livelihoods to a diversified livelihood model with combination of farming and off-farm employment. The 1990s marked the accelerated process of urbanization, leading to an increase in the number of village residents seeking employment opportunities outside the village. Concurrently, fishing activities declined due to the enforcement of stricter fishing bans, often extended to cover the entire year, along with the requirement for expensive fishery licenses, each costing approximately 3000 yuan. Each fishery license permitted about a month of fishing, corresponding to a single opening period each year. Fishing activities were further challenged by environmental protection measures, which resulted in minimal or no profits. Village residents typically cooperated in small groups for fishing activities. By the end of 2022, less than 10 households in the village remained actively involved in fishing. During this period, the cultivation of garlic and maize slowly emerged alongside the continued cultivation of rice and broad beans. In addition to agriculture and fishing, during this phase, the farmers of Gusheng Village began to engage in local infrastructure projects, such as road construction, as well as seeking employment outside the village. However, during this period, the income characteristics of these households remained primarily agriculture-based, with non-agricultural income serving as a supplementary source.

#### 4.1.3 The third phase: labor migration and tourism (from 2017 to present)

Since 2015, China has further integrated its ecological conservation policies with its national poverty alleviation policies, promoting the development of ecological industries nationwide, among which ecological tourism is one of the main approaches. The third phase, commencing in 2017, is characterized by a shift toward labor migration as the primary livelihood source for most village residents. Land transfers led to weakened ties between land ownership and the farmers themselves. Village residents primarily collected rent from their land or, for those with the ability, returned to the land for seasonal work. This phase is also marked by the emergence of tourism as another significant source of livelihood. Gusheng Village, known for its long history, has preserved its traditional culture and architectural style. Located adjacent to Erhai Lake, the village saw an increase in the number of tourists around 2015. Additionally, most village residents, having accumulated some capital from working outside, noticed the influx of tourists and began to operate guest houses, restaurants, and

shops in the village.

This financial opportunity prompted some village residents to renovate their homes and offer accommodation. In particular, 2017 saw the highest number of tourists. However, the benefits were primarily concentrated among a select few minority-themed guest houses, restaurants, and shops. An important event in 2017, the expansion of the lakeside ring road, caused many businesses and restaurants to relocate, rendering the lakeside area accessible only to pedestrians and cyclists. Interestingly, some village residents observed that the restriction on motorized vehicles along the ring road had a more significant impact on tourism development than the subsequent influence of the COVID-19 pandemic.

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## 4.2 Environmental context

Gusheng Village located at the core of the Cangshan Erhai Ecological Area in Dali, Yunnan. To the west, vast farmlands stretch, and to the north lies Yangxi River. The village enjoys a subtropical highland monsoon climate, free from severe cold in winter and scorching heat in summer.

In March 2017, the Yunnan Provincial Government of Dali issued a notice titled “Measures for the Special Rectification of the Catering and Inn Service Industry in the Core Area of the Erhai Lake Basin Water Ecological Protection Zone”. This notice, often seen as the strictest protection order for Erhai Lake, marked the beginning of a series of conservation projects and initiatives<sup>[27]</sup>. Key infrastructure development efforts focused on comprehensive sewage interception, treatment, and reduction. The construction of an 11-km Erhai Lake sewage interception network and 367 new septic tanks was completed. All waste from kitchens, bathrooms, livestock pens and washing facilities of 439 households in Gusheng Village is now connected to this network, preventing any wastewater from entering Erhai Lake. Environmental remediation along the lakeside, rivers, and canals was strengthened, including the implementation of the Yangxi Comprehensive Remediation Project, including 3.2 km of inflow channels into the lake.

In 2018, the Dali Bai Autonomous Prefecture in Yunnan Province introduced the “Dali City Erhai Lake Ecological Environment Protection ‘Three Lines’ Delineation Plan” establishing three protective boundaries (lines) around Erhai Lake in Dali City: Blue, Green, and Red Lines. The Blue Line demarcates the lake boundary. This area, within the Blue Line, is the centralized drinking water source for Dali City and a vital part of both the national Dali Scenic Area and the national

Cangshan Erhai Natural Reserve. In this zone, ecological conservation, biodiversity protection, and ecological restoration are implemented to restore the health of the lake ecosystem. The Green Line, set 15 m inland from the Blue Line, is the lakeside protective boundary. This area, crucial to the core zone of the Erhai Lake Water Ecological Protection Area, undergoes ecological conservation, restoration, and environmental management to revive its lakeside ecological functions. The Red Line, defining the core zone of the Erhai Lake Water Ecological Protection Area, extends 100 m outward from the Blue Line in the west and north of the lake (within the area of Shangguan Town) and 30 m beyond the road shoulder of the lake ring road in the northeastern part of the lake (within the areas of Haidong, Wase, and Shuanglang Towns). The Red Line area is the core zone of the Erhai Lake Water Ecological Protection Area<sup>[28]</sup>. In Gusheng Village, there are 53 households relocated within the Green Line, leading to the demolition of approximately 6100 m<sup>2</sup> of buildings and the restoration of 3000 m<sup>2</sup> of newly created wetlands.

Gusheng Village originally had a naturally formed wetland, which, after expansion and improvement, now serves as a park for leisure and scenic viewing for village residents and tourists. Simultaneously, it represents a vital ecological reservoir and in treating tailwater from farmlands. The stream flowing into this wetland is a tributary of the largest watercourse, Yangxi, within the 18 stream of Cangshan. It passes through upstream villages and farmlands, while it is used for irrigating agricultural land, there is also the issue of discharging fertilizers and pesticides into Erhai Lake. Directly entering Erhai Lake would severely impact the aquatic ecosystem. To effectively reduce the pollution of tailwater from farmlands into Erhai Lake, the government established multiple ecological reservoirs along the riverbanks, and this wetland is one of them. The bottom of the wetland was excavated to create multiple interconnected S-shaped ponds, planted with aquatic vegetation that purifies water quality. This allows water from upstream to undergo sedimentation of pollutants and purification by aquatic plants before flowing into Erhai Lake.

In addition to the environmental and lake protection plans of Dali City, Gusheng Village has also strengthened its collective participation in environmental protection through its own village regulations and conventions, and systems like the River Chief Scheme. The residents of Gusheng Village have been explicitly listed in the second clause of their village regulations that protects the Erhai Lake environment, and prohibits unauthorized occupation, random discharge and littering. Specifically, residents of Gusheng are responsible for the sanitation, greening and order of the areas in front of and

behind their houses; they support the village cleaning system by paying a specified cleaning fee. This fee is used to pay a portion of the wages for garbage collectors, river and beach managers. All residents must pay the rural garbage fee in accordance with the garbage charging standards set by Dali City, and the fee is collected based on a case-by-case approach.

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### 4.3 Transformation of livelihood from fishing to tourism

#### 4.3.1 The rise of the tourism industry in Gusheng Village

The bans on fishing, garlic cultivation and aquaculture have compounded the economic difficulties faced by the village residents. These measures, put in place to safeguard Erhai Lake's ecological balance, have had a direct negative impact on the income-generating activities that were previously relied upon by the community. As a consequence, the residents have had to adapt and find alternative sources of income.

The tourism industry has emerged as one such avenue for economic transformation in the region. However, it is not without its challenges, as the government has imposed a series of stringent environmental protection policies in the wake of the protection order for Erhai Lake issued in 2017. These policies have led to the closure of some guest houses and restaurants, along with stringent restrictions on new constructions, reducing the income of residents in Gusheng Village, who have traditionally been involved in these businesses. While these measures are essential for preserving the natural resources and environment of Erhai Lake, they have introduced income uncertainty for many in the community.

Presently, Gusheng households, despite possessing various livelihood resources such as land, housing, farmland, and labor, have limited access to property-based income. Consequently, their overall standard of living remains relatively low. Many households, after shifting away from agriculture as their primary source of income, face challenges in developing alternative livelihoods due to their limited production capacity and available resources. This necessitates the exploration of diversified income-generating opportunities and strategies for sustainable economic development.

#### 4.3.2 Changes in livelihood assets

For Gusheng Village, the most noticeable aspect of transitioning from fishing to tourism is the change in the utilization of natural capital. This change involves limitations imposed on how village residents can use their natural

resources. However, natural capital also serves as the foundation for the residents to engage in tourism-related activities. Currently, physical asset (traditional dwellings) and human asset are the most critical and promising assets for livelihood transformation in Gusheng Village.

#### (1) Limited utilization of natural assets

It is essential to emphasize the profound impact of both the fishing ban and land transfer policies on the residents of Gusheng Village, which has resulted in a significant reduction in their natural and physical assets. This, in turn, has placed them in a precarious economic situation, and this dynamic is intrinsically connected to broader issues of modernization and global environmental conservation.

First and foremost, the implementation of land transfer policies in Gusheng Village triggered a fishing ban, a critical component of the Erhai Lake protection initiatives aimed at preserving the ecological integrity of the lake. The fishing ban significantly curtailed the rights of residents to fish in Erhai Lake, which had been a traditional source of livelihood for many. This restriction on fishing rights has led to a notable decline in the natural capital of the community. The local fishers, who relied on the lake resources for their income, have seen their traditional way of life severely disrupted.

In addition to the depletion of natural resources, the land transfer policies have caused the redistribution of property rights and have altered the way land is used and owned. As a result, many village residents have witnessed a decrease in their natural and physical assets. Land, which was traditionally an important source of wealth and economic stability, is no longer as accessible to them. This change in property rights has not only affected their ability to generate income but has also limited their access to essential resources.

Consequently, the combined effect of these policies has left the residents of Gusheng Village facing significant challenges regarding their livelihoods and economic stability. They are forced to adapt to new income-generating strategies, often

without the necessary resources or skills to do so effectively. This transformation, while necessary for the broader environmental conservation efforts around Erhai Lake, has placed the community in a state of economic vulnerability.

#### (2) Traditional dwellings becoming a vital physical capital for livelihood transformation

In Gusheng Village, there are essentially three types of housing. The first is the traditional wooden structured houses. Historically, the Bai ethnic group preferred to live in clusters. Most families built a main house with three rooms for living. The majority of these traditional houses were of earthen and wooden construction, often adorned with rich architectural carvings. Some of these traditional houses are deemed "ancient courtyard preservation" by the government due to their excellent historical and cultural value. The second is the modern concrete houses. Since the 1980s, with improvements in living standards, residential architecture has undergone changes in materials and structural layouts. Most newly-built houses are now a mix of brick-wood and reinforced concrete structures, with modern residences gradually emerging. Currently, houses used as tourists guest houses are of this modern type. The third is the abandoned houses. In Gusheng Village, there are still some traditional wooden structured houses that have been abandoned (Table 2). Among them, a significant number of traditional wooden structured residences are suitable for habitation and can be rented out as a whole. The oldest of these houses in Gusheng date back to 1948.

There is a considerable number of abandoned houses with significant potential for revitalization, these dilapidated houses are scattered across every community in Gusheng Village. A rough estimate suggests that there are 31 such dilapidated houses. According to the Erhai protection regulations, buildings within the primary protection area cannot be rebuilt; however, if a building is genuinely dilapidated and serves as the only residence in the secondary protection area, it can be reconstructed. In the secondary protection area, if the building is not the only residence and not dilapidated, there is currently no policy in place at the county or city level.

**Table 2** Old houses, ancient courtyards, and abandoned houses in Gusheng Village

| Building                             | Total | Inhabited | Converted to production | Uninhabited |
|--------------------------------------|-------|-----------|-------------------------|-------------|
| Traditional wooden structured houses | 87    | 56        | 13                      | 18          |
| Ancient courtyards                   | 7     | 4         | –                       | 3           |
| Abandoned houses                     | 31    | –         | –                       | 31          |

The research findings reveal several critical dynamics within Gusheng Village: Firstly, a portion of the village residents, particularly the elderly, still inhabit old houses. This traditional housing practice persists despite the changing landscape of livelihoods in the village. Secondly, there is a substantial demand for new housing among most households. However, the preservation of older structures limits the options for new construction, impacting considerations such as the size and orientation of new dwellings. Thirdly, the ancient courtyards of the village possess significant historical and cultural value. These courtyards present untapped economic potential and merit further exploration. Fourthly, despite commendable efforts to improve the village environment, lingering issues such as clutter and unprocessed waste are still prevalent in smaller pathways and require continued attention. Lastly, the most prized assets for the residents of Gusheng Village are their real estate properties and human capital. With the elderly population experiencing a decline in human capital, the property assets have gained increased significance. Village residents aspire to maximize the strategic location advantage of their properties to generate economic value. Presently, of the 446 households in the village, 90 have properties available for rent, while 8 are actively constructing new structures and 9 are in the process of interior decoration. This underscores that the most direct and effective avenue for collective economic development lies in harnessing the property assets of the locals. During the interviews, a female resident of Gusheng Village shared with us the case of her family's livelihood transformation through the tourism. They partitioned their residence to create three separate spaces, renovating them for different purposes. One room was retained for their personal living, while the other three were transformed into guest rooms and rented to tourists. The average annual income from this business is around 30,000 yuan. In addition, she also works as a cook in other guest houses, contributing to her income by preparing meals, with an approximate monthly income of around 3000 yuan. Her daughter earns a yearly income of

30,000 to 50,000 yuan by providing makeup and photography services to tourists in the visitor area. The annual income of her family, revolving around the tourism industry, amounts to about 100,000 yuan. In the interview, she mentioned that the tourism is less physically strenuous compared to farming and migrant work, and is more inclusive for different ages, allowing even older individuals to participate. Most importantly, it keeps families from having to separate and work in different places, enabling them to live together in the village.

(3) Human capital becomes driving factor for the development of tourism industry

Over the past three years, inspired by national policies on rural revitalization and ecological industry support, more than 30 people from the village have returned to their hometowns (according to town government statistics, there were 56 people returning for entrepreneurial endeavors, although the exact time span is not specified). These returning residents exhibit a strong enthusiasm for finding employment and starting businesses in their local communities. The age distribution among these residents varies significantly, with some possessing property management skills, others having entrepreneurial experience and some being skilled in self-media marketing. The specific situations of some returning individuals are detailed in [Table 3](#).

Most of the residents in Gusheng Village excel in embroidery, followed by weaving. Remarkably, 14 individuals in the village possess expertise in three or more different handicraft skills. Gusheng Village is home to six cultural troupes involving more than 100 individuals, with the largest being the Gusheng Folk Art Troupe. This group engages in activities such as Bai ethnic duet singing, traditional folk dance performances, and hosting cultural events and celebrations.

**Table 3** Returnee population from 2019 to 2022

| Reasons for returning home                 | Number of individuals | Age/Gender   | Previous occupation   | Current occupation  |
|--|-----------------------|--|---|---|
| University courtyard employment generation | 2, 3                  | Females around 40 years old  | Working in Dali (cooking)   | Collective economic sector in the village   |
| Family members fell ill                    | 2                     | Female below 40 years old<br>Male in mid-40s   | Working as a casual laborer   | Opening shop and taking care of the sick family member                              |
| COVID-19 impact                            | 7                     | A couple in their early 40s<br>Three individuals around 40 years old (males)<br>One person in their early 20s (male); a woman in her 50s | Working in Xishuangbanna and Lijiang<br>Engaging in business in Ruili<br>Working in Cambodia<br>Running a door and window ironwork business for over 20 years | Operating a guesthouse<br>Occasional casual labor<br>Securing a government position |

Additionally, there are two cultural troupes dedicated to performing the traditional dance. One is organized by village officials and has participated in various reporting performances, while the other is an informal, female-led, amateur group that conducts regular rehearsals. Notably, Gusheng Village boasts a pool of skilled individuals in the field of construction, including masons, steelworkers, joiners, iron workers, welders, woodcarvers, electricians, decorators, and mural artists. One female resident informed us that the village often organizes various activities, such as cultural performances, handicraft workshops. She said that whenever she have time, she gather a few people to join in in such activities. Capitalizing her artistic talents, she participates in cultural events like Bai ethnic dance performances and earns a wage. These tourism activities not only provide her with opportunities for non-agricultural work but also bring in a significant amount of wage income.

#### 4.4 Reformed community governance under tourism

The transformation from traditional fishing to the development of tourism in Gusheng Village signifies a shift from a self-sustaining livelihood model to one that operates within a dynamic framework involving multiple actors, including society, businesses, government, and social organizations. Simultaneously, this transformation involves a redefinition of the talents of the residents and a reshaping of community governance among different actors.

In February 2022, the Gusheng Village Science and Technology Courtyard, co-founded by China Agricultural University, Yunnan Agricultural University, and the Dali State Government, was officially inaugurated. Over 20 organizations and more than 200 scientific personnel stationed in Gusheng Village are exploring new ways to protect Erhai Lake and promote high-quality agricultural development in coordination. Universities have introduced the Yunnan State Farms Group and Yunnan Province Grain Industry Group Co., Ltd., significantly constructing green agricultural production demonstration bases. The cultivated area adopting green ecological farming in the watershed has been increasing annually. As new participants in rural governance, universities have contributed to the restoration of natural ecology and the creation of ecological landscapes such as rice fields, ecological waterways and lakeside ecological belts. Additionally, a series of scientific guidance and rural planning have effectively promoted the development of characteristic industries and intensive agricultural operations, leading to increased income for rural residents.

With the introduction of universities as new actors in Gusheng Village community development, this established a new relationship between social service providers and communities. In addition, with the involvement and motivation provided by university teams, an increasing number of rural talents are being unearthed and they possess a strong willingness to participate in rural development. For example, an increasing number of young individuals have returned to the village, bringing their urban work experiences and innovative ideas to the realm of rural tourism. They have emerged as opinion leaders, guiding the community. Similarly, some residents who have inherited traditional cultural practices and preserved traditional craftsmanship, despite lacking experience in external labor markets, have incorporated their traditional culture into the development of tourism. This integration has transformed them into a new kind of talented residents.

## 5 Discussion

Based on the case study of Gusheng Village, we present the livelihood transformation process from fishing to tourism over a long time scale and discuss the drivers affecting the effectiveness of sustainable livelihood transformation in a lakeside community.

Firstly, the case of Gusheng Village illustrates that each livelihood transformation in the history of the village has presented an interplay and negotiation between environmental changes and community development. Each transformation has also reshaped the natural resource utilization methods adopted by the village. However, rural tourism, as an alternative industry to fishing, not only faces increasingly stringent environmental protection policies but also confronts multiple challenges from the community level, including the willingness to participate, capability to engage and management models.

Secondly, the case of Gusheng Village highlights the impact of livelihood capital at the institutional level during the transition from fishing to tourism. This shift has propelled a significant transformation in Gusheng Village livelihood capital, most notably the transition from reliance on natural capital to an enhancement of human and physical capital. Existing studies on the changes in livelihood capital brought about by livelihood transformation have also pointed out similar observations<sup>[7,18]</sup>. However, whether this livelihood transformation and the reorganization of livelihood capital can reduce livelihood risks in coastal and lakeside communities and whether tourism as an alternative livelihood is sustainable remain as important questions.

Our case study of Gusheng Village offers a perspective to address these issues. The development of the tourism industry can revitalize and transform the existing residences of farmers, creating restaurants and guest houses serving the tourism sector, thereby increasing the property-based income of residents. This is fundamentally different from the income derived from natural capital in fisheries. Of course, the transformation from fishing to tourism is not something that farmers can accomplish on their own. To enhance the physical capital and property-based income of the village, support in terms of policy and funding from the government, social organizations, and enterprises is necessary for the development of rural tourism and local asset revitalization.

In the case of Gusheng Village, the return of talented residents to the village, rural talent training and the involvement of social organizations have enhanced its human capital. This has fostered the formation of relationships among different actors and a rural governance structure based on new livelihood models. From the cases in this study, we have found the role of talent and new livelihood industry management models is increasingly prominent in ensuring the sustainability of the livelihood transformation. From a temporal perspective, integrating traditional livelihoods, landscapes, and cultures with modern livelihood methods is also an important factor in achieving the sustainability of village livelihoods.

## 6 Conclusions

Our study specifically examines the livelihood transition within Gusheng Village, a lakeside community situated adjacent to Erhai Lake in Dali City, Yunnan Province. We employed an adaptive SLF that goes beyond the standard pentagon of livelihood assets to emphasize the analysis of the process and sustainability outcomes of livelihood changes from both institutional and action-oriented perspectives. This holistic approach offers a comprehensive historical and geographical perspective, helping in the understand the dynamic process of livelihood transition and how interactions among different actors influence the outcomes of livelihood transformation. The protection of fishery resources and the transformation of local livelihoods, as a common global issue in recent years, highlights the escalating and complicating contradictions between resource conservation and community development. This study, as a single case study, has its particularities in social, historical, and geographical contexts, as well as some limitations for wider application. Research can further engage in comparative studies based on the transformations in fishery livelihoods encountered by different countries, regions, and villages, with the aim of delving deeper into the factors that influence the sustainable transition of livelihoods from fishing to tourism.

### Compliance with ethics guidelines

Feng Ba, Xiaoyun Li, Yue Ding, and Lixia Tang declare that they have no conflicts of interest or financial conflicts to disclose. This article does not contain any studies with human or animal subjects performed by any of the authors.

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