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Citation for final published version:

Yu, Li , Wei, Lu, Choguill, Charles and Li, Mo 2023. Liangshan Bank, A hybrid model of payment for ecosystem services governance in rural development: The case of Baofu, China. *Habitat International* 138 , 102879.  
10.1016/j.habitatint.2023.102879 file

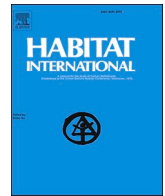
Publishers page: <https://doi.org/10.1016/j.habitatint.2023.102879>

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# Liangshan Bank, A hybrid model of payment for ecosystem services governance in rural development: The case of Baofu, China

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## ARTICLE INFO

### Keywords:

Liangshan bank  
Rural idle land  
Governance  
Ecosystem service  
Value realisation  
Rural development

## ABSTRACT

This paper focuses on the operation of Value Realisation of Ecosystem Products and Services based on empirical research of the Liangshan Bank model in Baofu, China. It examines a new hybrid approach to ecosystem services governance to address the problems of idle rural land due to urbanisation. The study finds that operating this new model enhances governance efficiency by coordinating different institutional policies and reducing uncertainties and transaction costs through a mechanism which is guided by the government, dominated by the market and participated by communities. The model can increase rural villagers' income by using idle rural land as a market asset.

The research outcomes show that the Liangshan Bank model, which provides a transparent trading platform for villagers and investors to effectively use rural land, protect the environment, and alleviate poverty, can exemplify other rural areas in China and developing countries. The paper highlights the academic debate on payment models for ecosystem services. It also offers an alternative model for governments and communities to achieve environmental protection, effective land use, and poverty alleviation in rural areas.

## 1. Introduction

Environmental governance is regarded as an essential political agenda and an important factor in facilitating the effectiveness of conservation and environmental management (Lockwood et al., 2010; Ostrom, 1999). Neoliberal forms of environmental governance, which involve a shift from state-centred command and control policies to market-based instruments (MBIs) to stimulate sustainable resource management without direct regulation, have been increasingly promoted globally by governmental, non-governmental and private organisations (Heynen et al., 2007; McAfee & Shapiro, 2010; McElwee et al., 2014). As a tool for neoliberal environmental governance, the payment

for ecosystem services (PES) has emerged as a dominant market-based approach to conserving ecological resources (McElwee et al., 2014). This mechanism has been widely used around the world, from developed countries to the developing South (McElwee et al., 2014). The concept of Value Realisation of Ecosystem Products and Services (VREPS) advocated in China, is also an approach to environmental governance. Like the PES, the purpose of VREPS is to protect the environment, realise the economic value of ecosystem services, and alleviate rural poverty. However, VREPS utilises market mechanisms, guided by the government and through community participation, to increase the effective use of idle land<sup>1</sup> in the urbanisation process while achieving common prosperity.

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<sup>1</sup> Apart from state-owned forests, rural land in China, including forest land, ponds, agricultural land and rural construction land, is collectively owned. Village collectives contract out the operation of such lands to rural villagers for a designated period. However, many rural villagers move to urban areas to pursue better incomes and living standards, abandoning their contracted land. The abandoned contracted land here is defined as "idle land." The forests in Anji are primarily composed of Moso bamboo, which reaches maturity in six years. Moso bamboo forests require regular cutting and maintenance to ensure healthy growth. The bamboo land's ecosystem services may be significantly impacted if abandoned. Abandoned farmland cannot provide food for humans or realise its ecosystem value because no one cultivates it. Uninhabited rural houses are a waste of land resources.

One consequence of urbanisation in many countries is the migration of rural populations to cities. Rural-urban migrants normally sell their land in the villages as they move to cities. The income from the sale becomes their capital in the cities. Nevertheless, this may result in idle land due to market failure or control policies. For instance, prior to the 2016 rural land reform in China, which involved the “separation of three types of rural land rights” (GOCCCP and GOSC, 2016), villagers did not have the right to trade in their contracted land and the land use right in the market because of the collective ownership system’s restrictions (Wan et al., 2021). Consequently, China’s rural areas are experiencing a decline caused by population loss, aging and abandonment of land, which leads to a stagnant rural economy (Li et al., 2022). A significant amount of rural land remained unused after rural-urban migration. Underused rural lands and settlements that fail to align with the goals of sustainable development (Li et al., 2022). Research by Shan and Feng (2018) suggests that abandoned arable land in rural China amounts to almost 2 million hectares per year, with abandoned and idle homestead land reaching nearly 7.60 million hectares (Yin, 2018). According to a survey by Włodarczyk-Marciniak et al. (2020), 90% of respondents viewed cultivated land as a significant element of an agricultural landscape. Furthermore, arable land plays a vital role in providing ecosystem services and adapting to climate change (Tanguay & Bernard, 2020). Given China’s limited cultivatable land resources, the abandoned arable land in rural areas must be addressed. Thus, there is significant potential for land-reusing policies and approaches, such as VREPS.

The development of VREPS is at the early and experimental stage. The *Liangshan Bank*<sup>2</sup> (LSB) in Anji County of China, which is viewed as an innovator of VREPS, is worthy of being examined. This mechanism has been operating since 2020. As one of the pilot project regions for this experimental practice, Anji County is actively testing the innovative environmental governance model of VREPS which is used here as a case study. In order to examine the operation of this environmental governance model, the authors select *Baofu*, a rural town under the jurisdiction of Anji County, to undertake detailed empirical research. This rural town is chosen because *Baofu* has already gained experience in delivering this model to achieve environmental protection, promotion of collective economic growth, and common prosperity for all villagers. *Baofu* has identified and mapped more than 105 resources to complete land recycling projects consisting of 30 plots of unused rural homestead land, 20 ha of rural development land of collective ownership and more than 650 ha of forest land.

This study explores and analyses the governance mechanism which protects natural resources while increasing rural villagers’ income by realizing the value of ecosystem products and services developed by the LSB in *Baofu*. Related research on this subject is limited because VREPS in China is at the initial development stage. This research on the governance mechanism of the LSB fills an existing gap in both academic research and policy-making on environmental governance in rural areas.

The LSB in *Baofu* operates a hybrid model of “government-market-community” by successfully forming a collaborative network among hierarchical tiers of government, market financial resources and communities. Through the institutional organisation of LSB, the affairs that used to be scattered across government departments are integrated into the new mechanism for more efficient policy delivery. Village and community chiefs play the role of brokers in bridging the gap between the formal system of the government and the informal system of the village/community under the “one-shoulder” policy. In this network, the trading platform of the LSB mechanism shifts the transactions from an informal system to a formal one to provide institutional protection and policy support. Consequently, the collective economic system as the main feature in rural China has been promoted while increasing

<sup>2</sup> This term is taken from Xi Jinping’s “*Liangshan Theory*”. “*Liangshan*” means “two mountains” in Chinese. Xi argues that an ecological “green mountain” can be converted into economic prosperity as a “mountain of gold and silver.”

ordinary villagers’ incomes and effectively enhancing the benefits of ecosystem services.

This paper is divided into six sections. After the Introduction section, the second section reviews the debates on ecosystem services and their governance. Section 3 discusses the methods of data collection in the study. Section 4 explains the process of “*Liangshan Bank*”. Section 5 is a discussion, followed by the Conclusion section.

## 2. Concepts and debates of ecosystems service and its governance: establishment of a context

### 2.1. Ecosystem and ecosystem services

It is stated in the *Millennium Ecosystem Assessment* (2005) that an ecosystem is a dynamic natural complex consisting of plant, animal, and microorganism communities and the non-living environment. Ecosystem services and goods that provide benefits to people operating in diverse forms within different political systems can be valued in terms of the economy (Wynne-Jones, 2013).

The ecosystem service can be divided into four types: provisioning, regulating, cultural, and supporting (TEEB, 2010). They refer to the benefit that humans derive from the ecosystem. Even though they may be provided for free, they can be expressed in economic terms and have the potential to be bought and sold in a market, as payment for ecosystem services was conceptualised. The definition of PES proposed by Wunder (2005) has been widely used, which suggests that PES should have both sellers and buyers in a market to operate a voluntary and negotiated framework for transactions.

However, ecosystem services are of unique characteristics. For example, the majority of ecosystem services are treated as public goods (TEEB, 2010), and the linkages between human beings and nature are complicated. Additionally, the diversity of actors involved in the process of ecosystem services means that different interests and values should be taken into account (Loft et al., 2015). Therefore, payment for ecosystem services cannot solely rely on a market mechanism. An appropriate type of ecosystem service in the form of governance, particularly a hybrid PES scheme, is a necessity (Wynne-Jones, 2013). Recognition of the hybrid mechanism of PES is an important starting point for understanding various institutional forms of PES (Higgins et al., 2014).

### 2.2. Governances of ecosystem and ecosystem service payment

Governance is understood as a model of social coordination (Kemp et al., 2005) and the role of institutions and collective actions (Hodge, 2007). Governance is different from the hierarchical command and control-based approach. It is understood as “the set of regulatory processes, mechanisms and organisations through which political actors influence environmental actions and outcomes” (Lemos and Agrawal, 2006, p. 298). It requires multiple functions and powers of government, markets and society synchronisation (Kooiman, 2003). Niu et al. (2023) argue that a robust governance capacity is crucial in rural areas to promote integrated development between urban and rural regions. The ecosystem services governance establishes “the institutionalisation of mechanisms for collective decision-making and collective action with respect to natural resource management” (Rival & Muradian & Rival, 2013, p. 4). Ecosystem services governance embeds the understanding that social and ecological systems are closely interlinked and co-evolved at different spatial and temporal scales (Berkes, 2017). The social systems include all the strategies and institutional settings developed to manage ecosystems, ideally to meet the needs of different social actors for ecosystem services (Folke et al., 2005). Thus, governance of ecosystem services requires collaboration, cross-scale efforts, and the involvement of many public and private actors (Rival & Muradian & Rival, 2013; Wilkinson et al., 2013).

Primmer et al. (2015) suggest that the agreed policies and decisions that should be implemented are the precondition for governance. In the

decision-making process, rational ecosystem service governance should be fully supported by related knowledge of the sciences. Governance as social coordination and collective actions addresses the connection between the ecological environment and human beings. They should learn and understand the knowledge and process and be committed to each other. Strategic behaviours should be considered because the actors in ecosystem service governance seek and secure their interests.

Primmer et al. (2015) present four modes of ecosystem services governance, including hierarchical governance, scientific-technical governance, adaptive collaborative governance, and governing strategic behaviour. They argue (ibid.) that hierarchical governance generates effects on the ecosystem structure; scientific-technical governance informs management and influences ecosystem function; adaptive-collaborative governance can also influence ecosystem functions and ecosystem services and shapes the benefits among stakeholders.

As part of adaptive-collaborative governance, social networks are essential in ecosystem governance and management (Ernstson et al., 2010). Social network research involves studying collections of actors and the relationships that connect or segment them (Kilduff & Brass, 2010). Networks are regarded as collective behaviours. From this perspective, network organisations are more likely to perform better than individuals (Klijn et al., 2010, 2015; Provan & Kenis, 2008). In the social network structure, there is a persistent pattern of “connection and division” between actors in complex social relations (Corman et al., 1989, p. 26). In this structure, a single participant is unlikely to control the structure of the network. Thus, brokerage positions often emerge in social networks, linking unrelated participants (Stam, 2010). This effectively means that they mediate social relations or “social capital” between groups (Burt, 2002, 2004).

The governance of PES is a mechanism for examining and balancing conflicting rights, responsibilities and interests among the stakeholders of PES. It attempts to compromise social protection and private land user interests (Pagiola et al., 2005). Thus, it shifts the governance of natural resources from centralised control by the state to decentralised actors responding individually to incentives (McAfee & Shapiro, 2010). In the practice of PES, as the institutional framework and property rights are often blurred, a combination of formal and informal systems is needed to reconcile conflicts between the different actors involved. Thus, it is suggested that multiple or hybrid governance structures can achieve effective governance in PES (Farley & Costanza, 2010).

There are also important debates concerning PES governance. By taking a dialectical view of the issue between equity and efficiency in PES from a political economy perspective, some scholars argue that the PES mechanism emphasises efficiency as a market-based and neoliberal protection tool to promote privatisation and may even exacerbate existing inequalities (Kosoy & Corbera, 2010; McElwee, 2012; Pascual et al., 2010). In addition, the PES concept has been criticised from a broader governance perspective. It is argued that most practical initiatives ignore the institutional context in which human interaction takes place and thus rely too much on the potential of the market to overcome problems that require a broader approach to collective actions rather than mechanisms based primarily on individual decision-making (Vatn, 2010; Muradian et al., 2010; Van Hecken & Bastiaensen, 2010). It is realised that there is a lack of research on PES in both academia and policymaking in China. The research gap needs to be addressed. This is the contribution of this study.

### 3. Research methodology

The information required to meet the objectives of this research consisted of a review of documents and face-to-face interviews. The main investigations were carried out during trips to the case study area between July and September 2021. An additional survey was taken place in earlier March 2023.

The most important background documents reviewed in this study included policies promulgated by different tiers of government

**Table 1**  
List of LSB-related documents.

Publishers		Documents
National level		Establishing Mechanisms for Realizing the Value of Ecosystem Products
Local Level	Province Government	Implementation Plan for Zhejiang’s High-Quality Development and Construction of a Common Prosperity Demonstration Zone (2021–2025)
	County Government	The policy of Establishing a County based on Ecological Environment and Ecological Economy (2000) Anji County Comprehensive Plan (2006–2020) Action Guidance for Development of Beautiful Countryside in China (2008) Anji Territorial Spatial Master Plan (2021) Introduction to Liangshan Bank (2020)
	Town Government	Liangshan Bank project database of Baofu (2021) Comprehensive Tourism Plan of Baofu (2019)

Sources: Summarised by authors

(Table 1).

Semi-structured interviews were carried out with local government officials and those concerned with the project to gain their insights on the VREPS process (Table 2). In addition, questions were asked concerning their thoughts on whether this model could be applied in other areas with similar problems. The question posed to government officers included the operating mechanism of the LSB, the mechanism of land use price in the market, and approaches to control land use in line with policies and the lessons for replicability to other areas. The information required from investors consists of accessibility to the available information on land and projects, impacts on the investment decision, and their views on LSB. The questions for villagers mainly on their engagement in decision-making, including the price of land and posed projects in the market, and their benefits and views of LSB.

## 4. The role of the Liangshan bank

### 4.1. The objectives for establishing Liangshan Bank

To deliver an ecological civilisation, the State Council of China issued a policy of *Establishing Mechanisms for Realizing the Value of Ecosystem Products*. This policy requires innovative mechanisms to operate VREPS (the State Council of the, 2010). The policy also encourages the enhancement of educational and cultural tourism development through the coordinated implementation of ecological and environmental system improvement and the construction of supporting facilities (ibid.). Anji County, as the first ecological county designated in

**Table 2**  
List of interviewees.

	Occupation	Basic Information
Mr A	Government officer	Responsible for township affairs
Mr B	Government officer	Responsible for LSB
Mr C	Village Chief	In charge of a village with a relatively well-developed collective economy
Mr D	Village Chief	In charge of a village with a relatively weak collective village economy
Mr E	Investor	Tourist investment in Baofu through LSB
Mrs F	Investor	Tourist investment in another place but one recent transaction through LSB to invest in Baofu
Mrs G	Villager	Idle resource providers; Land Contractor
Mr H	Villager	Hotel owner No idle resources
Mr I	Senior staff	Liangshan Bank

Source: Authors

China, has always emphasised sustainable development in local government documents in local government documents (Anji County Government, 2006; 2008 and 2021) since it proposed to develop an “ecological county” as its development strategy in 2000 (Anji County People’s Congress, 2000). The town of *Baofu* was identified as an ecological agro-tourism integrative experimental zone, where rural ecological tourism and other related industries should be cultivated and promoted (Anji Liangshan bank, 2021). At the township level, the *Comprehensive Tourism Plan of Baofu* was produced to create a rural holiday destination in the Yangtze River Delta and the first sustainable pilot town in the country (*Baofu Town Government, 2019*). However, the town of *Baofu* had been suffering from rural depopulation in the process of urbanisation. As a consequence, many homesteads, and cultivated and forest land were abandoned in the villages under its jurisdiction. In response to the central government’s policy, the mechanism of *Liangshan Bank* was established to use ecological resources and idle agricultural land to realise their value.

#### 4.2. Progress of the Liangshan Bank in baofu

According to a senior member (Mr I) of Anji *Liangshan Bank* (LSB) in an interview (September 9, 2021), LSB is not a traditional bank that provides financial services; rather, it is a local government-owned organisation that functions as a special trading platform by pooling the idle resources of scattered depositors as funds and resources for economic activities. LSB operates by utilising natural resources, such as mountains, water, forests, land, and local cultural and historic resources. The mechanism is to centrally collect and store these resources, and then trade them on the market to support economic activities after integrating and upgrading the pooling resources (Anji Liangshan bank, 2021). As one of the pilot LSB practices, the LSB of *Baofu* operates under the leadership of Anji County LSB (Anji Liangshan bank, 2021), which is responsible for coordinating all pooling resources in the county and promoting major projects. The function of a township LSB, such as the LSB of *Baofu*, is responsible for identifying, mapping and entering the information of resources onto the LSB platform for major projects. It can also operate independently and participate in small-scale projects (*ibid.*).

#### 4.3. Resource transaction process via Liangshan Bank

In an interview with a local governmental officer, the process of LSB of *Baofu* was divided into two parts: task decomposition and comprehensive integration (Mr A, August 27, 2021). The decomposition process includes resource mapping, identification and assessment, and resource acquisition and storage; the comprehensive integration process includes information entry, investment and operations matching, and profit distribution (Fig. 1).

The process starts with resource mapping, which is a task delegated by the township government to the ten villages under its jurisdiction. The ten village committees report the mapping process of idle resources in their respective villages. It involves a two-way system of top-down (downward mapping by village committees) and bottom-up (villagers’ voluntary reporting on their initiatives) processes (Mr B, August 20, 2021). After mapping and completing the assessment and confirmation of idle resources, the township government makes agreements with villagers on the boundaries and property rights and commissions a third party to price the resources. The third-party institution then makes reasonable adjustments to the price of using “idle land” in accordance with the “National Standard for Ecosystem Assessment and Technical Specification for the Accounting of Gross Ecosystem Value” produced by the central government and the local standard for “Technical Specification for Accounting for Total Ecosystem Value of Ecosystem Products” issued by the government of Zhejiang Province. The next step is the resource acquisition and storage process, operated by the village collective economic organisation (VCEO), which includes the local collective economic shareholding cooperatives and tourism development

companies owned by the village collective. They use the collective funds to transfer the use rights of idle resources from villagers. (Mr C, September 10, 2021). For village committees with a finance shortage, LSB of *Baofu* helps them pool larger-scale idle resources by using 10 million *yuan* of the Resource Purchase Fund received from the county. The information on these resources is collected from Township Resource Database and uploaded to the County LSB Platform. When the data is ready, the prospective investors and operators can explore and match with idle resources through the trading platform of LSB. After the investment or operation of the project generates profit, the process of profit distribution is carried out. A portion of the proceeds is given to villagers as dividends. Another part is used for ecological conservation, enabling sustainable development in *Baofu*, besides the profits of the investors and operators (Mr A, August 29, 2021).

The distribution of proceeds varies depending on the characteristics of the projects and the related participants. Unlike Vietnam, which has a similar political system, where the main purchasers of ecosystem services are state-owned enterprises (McElwee, 2012), the participants of PES in *Baofu, Anji* are diverse, and many investments are from the market capital. According to the interview with Mr I (interviewed on March 7, 2023), the “*Liangshan Bank*” acquires land of different characteristics according to the needs of development. For example, arable land is used for agro-ecological tourism projects, forest land is mainly used for forest economy or bamboo forest carbon sink projects. The homestead land is used for the development of B & B accommodation, and the collective development land is transferred and developed to build an industrial park for common prosperity.

However, it was found in the survey that the main investment projects of the market capital are rural tourism development related, such as the “*Zhangnan Wushan Manyungu*” project, which covers a large amount of mountain and “*Tongli Hongyanya*” of mountain forest for eco-tourism development, or “*Muye*” project, which consists of an abundant homestead and 2.6 ha of the surrounding forest. The rural VCEO also participates in the development of some projects on its own, such as the e-commerce base in *Tongli* village, where the original abandoned building site was transformed into an incubation centre for small and micro e-commerce enterprises. “*Hongjiacun Idyllic Complex*” of 34 ha and “*Shanmin Culture Street*” of 2 ha were also operated by VCEO. In addition, the “*Liangshan Bank*” operated directly on some less or even no-profitable innovative projects. For example, the Bank acquires the necessary arable land to experiment with innovative projects in agriculture, such as the cultivation of water-saving and drought-resistant rice.

Different characteristics and participants of the project in the project result in a different distribution of project profits. In the cases of land use right transfer projects, where the developer is given the right to use the land, 80% of the net proceeds from the developer’s fees are received by the villagers, with the remaining 20% being used mainly for ecological protection and a small amount to subsidise the village community management organisation after the price is agreed upon through negotiating with investors/developers (Mr I, interviewed March 7, 2023). However, quite a few projects use the “villagers + collective economic organisation + market capital” model of shareholding cooperation. Under this model, the benefits of local villagers and communities should negotiate with developers or investors in the market. In general, the villagers’ income comprises three components of rent of land, salary and year-end dividends (Mr C, interviewed on March 7, 2023).

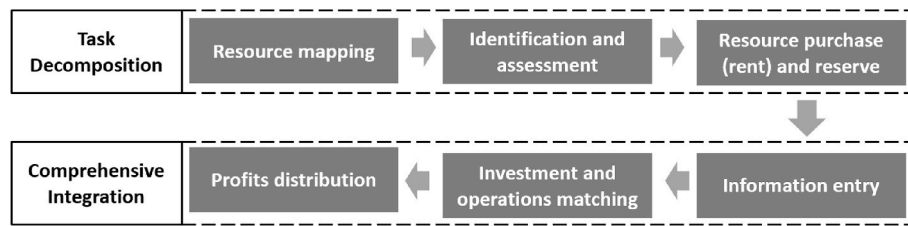


Fig. 1. Resource conversion process of *Liangshan* bank.  
Source: Authors based on the interviews

#### 4.4. The process of transferring use rights of property

The reform of “the separation of the three rights”<sup>3</sup> (GOCCCP and GOSC, 2016) pertaining to rural land and homesteads has facilitated the trading of ecological resources and rural land through *Liangshan* Bank. In *Baofu*, the process of resource conversion involves two major shifts (Fig. 2), the first of which occurs during the resource acquisition and storage stage. Villagers with multiple homesteads and rural land or those who have voluntarily withdrawn from their rural household status due to migration to urban areas may return the eligibility for acquiring their homestead and rural land, including ecological land occupied by villagers such as forest land and tea farms, or the abandoned cultivated land, to the village collective which is the owners of rural land according to law.

It is important to note that the Anji County Government has promulgated the policy, “Notice of Implementation Measures for Anji County Guarantee of Standard Land for the Development of Rural Projects to Promote the Common Wealth of Urban and Rural Areas” (Anji County Government, 2021a, 2021b), to promote social stability and prevent villagers from impoverishing themselves in the long term. The transfer of land is based on the villagers’ voluntary decision while being subject to review and approval by several government management departments, including the township government, the County Development and Reform Commission, the County Finance Bureau, the County Resource Planning Bureau and the County Housing and Urban-Rural Development Bureau. Moreover, in accordance with China’s land act, the transfer of rural land involves only the right to use it, not its ownership or the right to contract it. The *Anji County Government* (2021a, 2021b) has mandated that the maximum duration for which the right to use rural land may be transferred does not exceed 20 years.

To complete the shifts, the LSB can assist the VCEO by using the Resource Purchase Fund to obtain a profit margin and taking a stake in the rights of use (or management rights), which can then be transferred to the market. The second shift occurs during investment and operation matching, as the use rights and management rights shift from the VCEO, villagers, or the LSB (when the Resource Purchase Fund is used) to the market’s capital (Fig. 2).

## 5. Discussion

### 5.1. A hybrid “government-market-community” model of governance

The governance system of *Liangshan Bank* (LSB) in *Baofu* can be understood as a hybrid governance model based on market mechanisms while relying on hierarchical tiers of government and communities (Fig. 3). This hybrid model with diverse but integrated functions and

<sup>3</sup> The separation of the three rights of the Chinese government’s policy on rural land and homestead refers to the ownership and use right and eligibility for acquiring a piece of rural cultivated land, forest, and homestead. It involves ownership, contract right, and the right of the management. In rural China, the land policy states that ownership of all types of land belongs to the village collective.

powers of government, markets and society (Kooiman, 2003) is a proper operation of payment for ecosystem service governance in development. This model combines formal and informal institutions to address issues such as institutional and property rights ambiguities that often arise in ecological governance (Vatn, 2015). In rural China, the land belongs to collective ownership; individual households own the right to contract and use the collective-owned land, even the homesteads. This type of ownership creates great uncertainties for the private or informal transaction of rural land in rural areas of China.

The establishment of LSB provides a formal mechanism of governance for effective land use in rural areas. The hybrid governance model consists of administrative instructions and the trading market. The administrative directive refers to the hierarchical administrative tiers from the central to the local governments, which transmit the policies, plans, and tasks from the top down. Local governments at the county and township levels rely on the City Investment Ltd. (a company that acts as a local government financing platform) to set up the LSB and implement the higher hierarchical governments’ policy of ecological civilisation and common prosperity. Besides this administrative system, the trading mechanism of LSB is an institutional structure that relies on the market for resource allocation and transactions. It facilitates a transaction agreement between buyers and sellers through negotiation (Wunder, 2005). The mechanism clarifies property boundaries, usage periods, use rights, and the transaction price, which are secured by formal contracts and records of the ordinary market transaction. Nevertheless, it should be noted that the related land is still owned by local collectives.

The LSB in the county and township are operated differently from the informal community governance system at the village level. Due to the rural social network and property rights structure, rural community governance is inherently complex and irregular. It can never be solved in a simplistic and batch-oriented manner (Wu & Lin, 2017). Villagers tend to trust members within the village communities and are exclusive to those outside the community. Therefore, self-governance seems to be more effective (*ibid.*). The informal institution is adopted in the village governance process of LSB in *Baofu*, where the village chiefs manage the village by establishing village rules and regulations that the village community believes in. This approach is more flexible in its operation and better adapted to the social structure and governance context of villages. In practice, the village chiefs use their close social ties to carry out the popularisation of the LSB, coordinate disputes over property rights, and mobilise ecological resources for the purchase and collective economic participation. This informal system of governance overcomes the constraints of the formal system in some respects. It considers the so-called *Guanxi* (interpersonal social ties) in rural society, which helps to facilitate the implementation of projects. Without close social ties, it is not easy in rural society to implement top-down policies. For example, the village chief uses collective funds to help needy families advance shares in a collective economic project and repay them with profits when they achieve profitability, thus enabling local villagers in financial difficulty to enjoy the project’s long-term benefits. It is unpracticable in a formal institution.

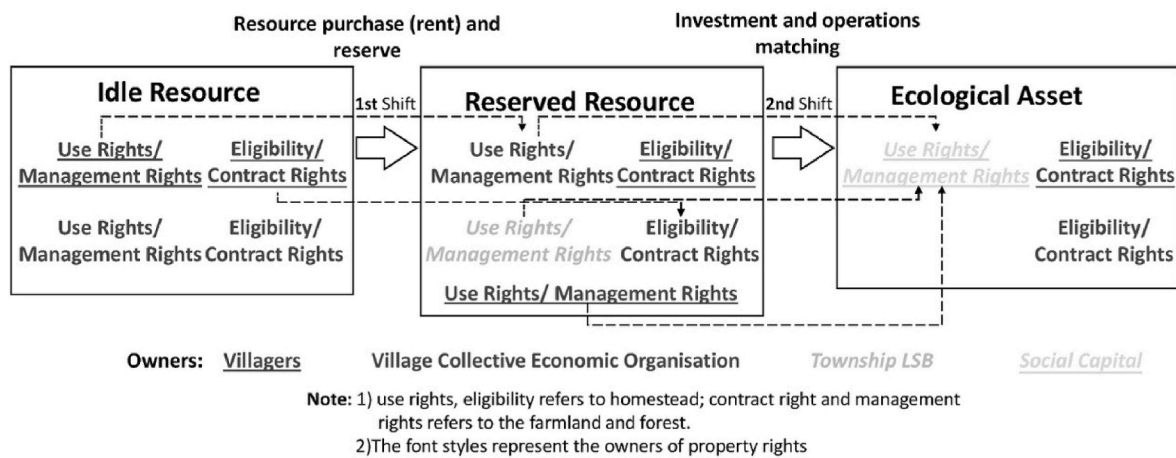


Fig. 2. The process of shifting property rights. Source: by authors based on the interviews

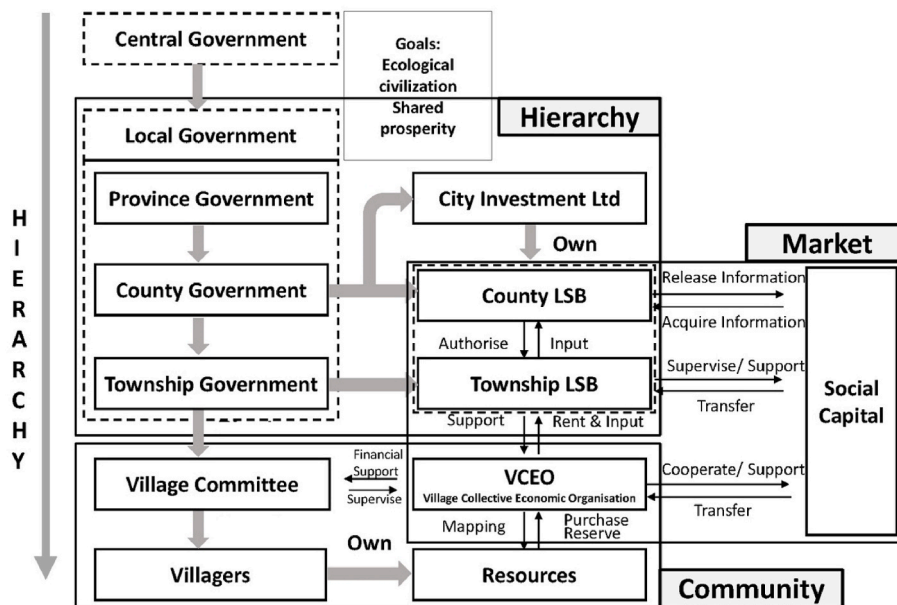


Fig. 3. The mechanism and “government-market-community” model in LSB governance. Source: Authors

5.2. Efficiency increase of a governance network

In the literature, the Chinese governance model has been conceptualised as “fragmented authoritarianism” in analysing and arguing for social and economic development and issues in environmental governance in China (Clarke-Sather, 2019; Eaton & Kostka, 2014; Gill et al., 2018; Martha, 2009). The “Division of Vertical” characteristic of traditional local government is responsible for the lack of unity of objectives and inconsistency of policies and information between different tiers of government and different government departments at the same tier. This has led to contradictions in implementing environmental management tasks, and development policies and projects at the bottom levels. It increases the costs of operations and transactions due to requirements of frequent interactions among governmental departments, investors and local communities as the consequence of multiple conflicting goals and project recommendations that are promoted by various governmental departments, such as the departments of development and reform, environmental protection, tourism development and agriculture, urban and rural planning. Implementation efficiency

has been reduced significantly (see Fig. 4 Left) because of this “fragmented authoritarianism”.

The establishment of LSB has changed the framework of relying entirely on administrative departments for ecosystem governance by being embedded in a network of administrative organisations rationally. It integrates the operations of various departments in the process of policy delivery. Meanwhile, it is structurally embedded to connect the capital of the market and village communities to establish a structured governance network. In this network, the LSB plays the role of a broker among the government, the community, and the market capital to build a strong bond (see Fig. 4 Right) and mediate effectively among stakeholders (Burt, 2002, 2004) to facilitate the governance process. Specifically, the LSB at a county level was set up by the government-owned Investment Company; the staff, who mainly comes from governmental organisations or the Investment Company, are more efficient in dealing with the various governmental departments than investors. This enhances the efficiency with which village communities and investors can interact directly with township LSB.

It was indicated in Section 5.1 that villagers are self-governing entities

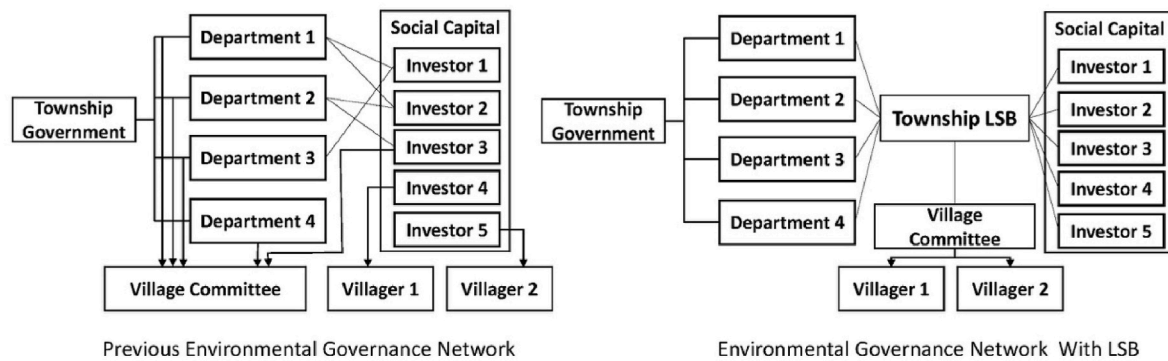


Fig. 4. The changes in environmental governance network in township.  
Source: Authors

where the social network structure can be approximated to the closure model. This model demonstrates a closely linked social network between the village chief and the villagers. Nevertheless, A critical issue may arise in terms of the lack of effective policy transition mechanisms between hierarchical tiers of government and village communities within this social network. This issue is particularly relevant when the village party secretary, who typically comes from outside the community, and the village chief, who usually comes from the local community, are two distinct individuals. As illustrated in Fig. 5, individuals from outside the community may encounter unexpected difficulties in establishing the necessary social networking relationships (Gulati & Gargiulo, 1999) required for effective policy delivery within villages.

The case of the LSB in Baofu illustrates the importance of the “one shoulder” mechanism of the village chief to function as a broker in the governance process. On the one hand, the village chief, holding a Party Secretary position, means there is accountability in facilitating the implementation of tasks and policies from the hierarchical governments. On the other hand, the identity of the village chief as a member of the village indicates that the chief has good local knowledge of the local context and good *Guanxi*. It is then easier to communicate with local villagers to mediate conflicts within the village. This mechanism, as operated in LSB, promote coordination between the formal and informal institutions by strengthening the links between local governments, market and village communities, thus transforming the close network type of governance and achieving effective transmission of objectives from the county and township to the village committee and villagers.

As a result, the LSB has successfully integrated matters that were initially scattered across governmental departments through relational

embedding and forming a governance network between the hierarchy of governments, the market and communities, thereby enhancing the efficiency of communications. LSB, by forming an institutional framework supported by the central government’s policy on clarifying property rights of rural lands, has increased its efficiency and reduced transaction costs.

Mr E pointed out in his interview (August 26, 2021) that in the past, the transition cost was very high due to the need for referrals from peers, assistance from village collectives, or travelling to rural areas to seek appropriate resources to access investment information. In contrast, LSB was designed to tap into the dormant resources of rural areas by mobilising multiple subjects where villagers voluntarily report their available resources and village committees actively rank them (Interview with Mr D on August 29, 2021). As an open trading platform for resource information, LSB was created to provide investment opportunities and information to the market, thus significantly reducing transition costs (Mr E, August 26, 2021).

Furthermore, before the establishment of LSB, villagers often engaged in repeated negotiations over the transaction price and land definition boundaries, resulting in difficulty and complexity in reaching a consensus in an informal market as mentioned by Mrs F in her interview on September 3, 2021. Since the establishment of LSB, there has been enhanced clarity on the definition of property rights and preferential conditions. Additionally, prospective buyers and sellers can efficiently conclude transactions with consensus due to the clear resource information (Mrs F, interview on September 3, 2021).

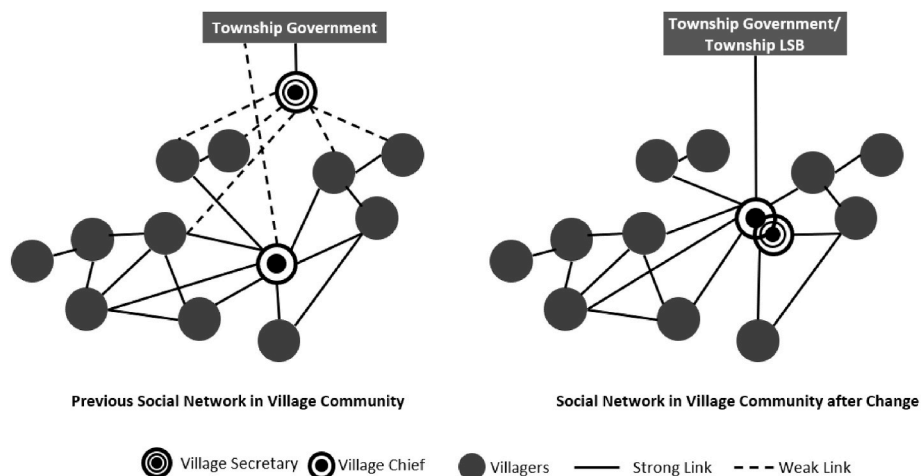


Fig. 5. The changes in social networks in the village community.  
Source: Authors



### 5.3. Reduction of uncertainties in transactions

The LSB reduced uncertainties in ecosystem service governance transactions (Muradian & Rival, 2013; Sattler et al., 2018) by operating within the formal system, providing institutional protection and policy support while strengthening government and village committee supervision in ecological governance.

Before the launch of LSB in *Baofu*, there was no formal market for trading ecosystem services and rural lands, instead, there was an informal market for villagers' idle land. The transactions were subject to much uncertainty. The operation of informal transfers caused significant risks and conflicts among stakeholders (Wan et al., 2021). In an interview, Mr E stated, "In the absence of policy guidance and financial support, the village did not dare to purchase the farmhouses though they are unused. It is a wasted resource" (interview on August 26, 2021). According to Mrs F (interview on September 3, 2021), investors were unsure if the law would protect their investment in forests, mountains, and other ecological assets after disputes arise, or if they would receive appropriate compensation after a lawsuit. This uncertainty led to hesitation among potential investors and developers in investing in rural ecological assets and idle properties.

LSB integrates fragmented transactions that would otherwise occur under informal institutions into the formal institution by tying them to government credit and establishing formal transaction systems. In this formal institution, the information about the transaction, such as property rights, price and terms, is more straightforward and transparent. Moreover, the transaction is legally and institutionally guaranteed. This shift allows the government and village committees to supervise and support the process of transactions that initially involved only villagers and prospective buyers in the market. Additionally, the LSB aggregates and centrally posts idle resources to the county LSB Resource Information Platform, reducing the cost for prospective investors and developers to access investment information. *Liangshan* Bank serves to bridge the information gap that has resulted in the division of urban and rural markets (Niu et al., 2023).

### 5.4. Poverty elimination

It has been stated by Millennium Ecosystem Assessment (2005) that inappropriate governance of ecosystems creates a significant risk to impoverished communities and may threaten their survival. Sustainable management of ecosystems is crucial in reducing poverty (TEEB, 2010). However, some scholars argue that payment for ecosystem services (PES) under neoliberalism encourages privatisation and exacerbates inequalities (Kosoy & Corbera, 2010; McElwee, 2012; Pascual et al., 2010), presenting differing viewpoints.

Nevertheless, this research discovered that the governance of repurposing idle rural land by *Liangshan* Bank plays a crucial role in facilitating the shift from a predominantly productive and stable countryside to achieving comprehensive and diversified development with multiple goals (Long et al., 2022). Rural diversification generates multiple sources of income for rural villagers. With the operation of LSB, the rural collective economic institution has enabled the diverse collective economy and villagers to increase their income and promote equity in distribution leading to a reduction in rural poverty. The rural collective economic system plays a vital role in leveraging economies of scale, mediating market failures, and promoting distributive justice (Zhou, 2018). Tong (2013) argued that the collective economy has an irreplaceable function and needs to be regulated as long as there are differences in strengths and weaknesses between villagers and the market mechanism. In the villages of *Baofu*, villagers are shareholders in the VCEO. For some newly emerged collective economic organisations, such as tourism companies and bamboo production co-operatives, most villagers take direct shares by funds or land. The rest enjoy indirect incomes by sharing property rights in the village's collective business land. The LSB made the VCEO become the seller in the transaction,

accumulating funds for the collective economy by leasing collective-owned land for ecological development projects for profits (Chen & Shang, 2013). For example, the survey found that *Jingxi* village generated an additional 5.1 million Yuan in 2020 through the LSB practice, with half of the income distributed to local villagers' dividends. Even some villagers who were not involved in the *Liangshan* project also received an income at the end of the year because they had shares in the collective economic organisation. Families in *Jingxi* Village could receive a dividend of over 4300 Yuan (Mr H, interview on August 26, 2021). Furthermore, the villagers can also increase their income by leasing the use right of their idle assets through LSB and freeing them from the tedious task of tending to their affairs (Mrs G, interview on August 27, 2021).

In the earlier days of property transactions between individual villagers and investors, local villagers were often disadvantaged due to their lack of knowledge of market information. Under the LSB trading institution, the interests of villagers can be significantly protected through negotiations between VCEO and investors and developers. The approach to LSB governance has changed the situation where only a few trading villagers directly benefited from the property transaction in the market. As the collective economy of the village grows, each villager can receive a share of the appreciation of the collective assets under the LSB governance mechanism.

### 5.5. Eco-economy promoted by PES for sustainable use of resources

Anji is the first eco-county designated by the Chinese central government. Delivery of an eco-economy with a low impact on the environment has been regarded as a main feature of the Anji ecological development model (Marsden et al., 2011). The PES governance model of "*Liangshan* Bank" has positively contributed to the development of the green economy in *Anji*, including *Baofu*. The operation of PES is creating incentives for sustainable resource uses, boosting the local economy, and raising the incomes of local villagers by reusing idle land in rural areas.

This study also found that PES contributes to carbon peak and neutrality. The Chinese government has made a commitment to reach a point of maximum carbon emissions, known as a "carbon peak," by the year 2030. Additionally, they have set a goal to achieve carbon neutrality by 2060. Carbon neutrality entails the crucial task of balancing greenhouse gas emissions across all sectors of the economy. Typically, this objective is accomplished by implementing measures that offset carbon emissions, such as initiatives focused on planting trees. In the pursuit of this goal, Payment for Ecosystem Services (PES), particularly for forests, including bamboo forests, will play a significant role in facilitating progress. Anji is famous for its bamboo forests, which cover 66,667 ha, including 58,000 ha of moso bamboo. About 50,000 villagers used to work in the industry, contributing 20% of the country's bamboo industrial output value with 1.8% of the country's bamboo production. However, due to the decline of bamboo forest profits and the migration of villagers to urban areas, more than 12,000 ha of Anji's moso bamboo forests have been abandoned. The bamboo forest has the function of a carbon sink. In 2021, the "*Liangshan* Bank" stored over 1333 ha of bamboo forest by paying a one-time payment of more than 1 million yuan for three years of bamboo forest carbon sink storage funds.

The authors have found a notable phenomenon in the study of Anji. There is a general awareness of environmental protection among the ordinary villagers of Anji, who can consciously take the necessary measures to reduce the impacts on the ecological environment. In the villagers' perception, a good ecological environment brings them economic benefits. This may explain why the "*Liangshan* Theory" originated from Anji. It may also explain why the "*Liangshan* Bank" has been implemented relatively successfully in Anji. However, regulation is crucial to avoid any negative impact on the environment. In the process of land acquisition and reuse, the County Resource Planning Bureau needs to confirm the function of land resource use and ensure that it

adheres to the regulations and requirements of the County Territorial Spatial Planning. Additionally, the Environmental Protection Department should also need to review the environmental impact assessment of projects (Mr I, interviewed on March 7, 2023). *Baofu* Town, the subject of this study, has a development strategy with rural tourism as its primary focus (*Baofu Town Government, 2019*). Therefore, the use of “idle land” and the realisation of its VREPS should be oriented towards this goal. As a result, the land uses in *Baofu* are related to rural eco-tourism, carbon sinks, or functions related to agricultural and forestry production.

### 5.6. Contractions between policy and market

Governance of payment for ecosystem services involves different stakeholders, each with unique needs and interests. Although public sector intervention (Loft et al., 2015) is crucial in the governance process, it can have implications for investors and developers in the market. Stakeholders who experience financial losses due to policies are typically dissatisfied. In the LSB governance model, government policies may impact the potential buyers in the market. A survey found that when buyers pay for the right to use a property, such as a rural house through LSB, the refurbishment of the house may not be easy due to local development of control policies or regulations of the higher tiers of government. For instance, the Anji County Rural Residential Land Management Ordinance was issued according to the Building Control Ordinance promulgated by the Ministry of Natural Resources, which aims to control and reduce the total amount of development land in rural areas. This exposes new investment projects in rural areas to stringent land-use restrictions, forcing investors to spend more on renovation than on redevelopment, even though it does not affect the total amount of development land in the countryside. In addition, the use of the Resource Purchase Fund leads to conflicts between the formal and informal systems. The allocated Resource Purchase Fund is strictly regulated, requiring applied projects to meet the formalities and scale in the formal institution. Village governance, on the other hand, as discussed earlier, is informal and uses relatively vague methods in resource collection, such as purchasing old buildings from the villagers who have built another new house in the village. This does not always align with policy or procedure, making it difficult to meet application requirements for funding support.

Moreover, the shortage of funds is more likely to occur in villages with a weak collective economy, despite the 10 million Yuan of Resource Purchase Fund available to support village collective purchases. The requirements for the Fund are stringent, with a single transaction barely meeting minimum requirements. Additionally, the condition mentioned above regarding ordinary farm buildings as cultural buildings is also excluded (Mr B, interview on August 20, 2021).

## 6. Conclusions

This research examines the *Liangshan* Bank (LSB) governance model for enhancing the value of ecosystem services and improving the effectiveness of rural idle land use through a case study in *Baofu* town, China. The research findings illustrate that the establishment of the *Liangshan* Bank creates an environment that helps foster coordinated development of population, land, and the economy in rural areas, enhancing their resilience to risks and increasing their competitiveness (Long et al., 2022). This research also supports the argument in the literature that the governance of ecosystem services and payment for ecosystem services should be a hybrid mechanism involving government regulation/rule-making, market forces, and community participation, even in the market economy (See Vatn, 2010; Muradian et al., 2010; Rival & Muradian & Rival, 2013) particularly when ecosystem services are viewed as public goods. This model offers the best practice and example for other areas in rural China and potentially other developing countries. Despite China's unique system compared to other developing

countries, the governance model of the “*Liangshan* Bank” remains adaptable to the developing world. However, the adaptation of the model should consider the land system of each country, including ownership and the different approaches to development control on land and its use rights. In addition, the promotion of private capital investment is essential for the sustainable operation of payment for ecosystem services, as PES cannot rely solely on government funding. Nevertheless, ES with a public good and a low return on investment may require government investment.

In the process of rural idle land recycling through LSB, the hierarchy of governments and the market establish a formal institution. The ambition of the upper-tier government and their strategies, land use planning policies and objectives are transmitted through hierarchical directives. The *Liangshan* Bank provides a mechanism for the rural land market and a platform for negotiation, making a transaction agreement, and formalising the market's trading behaviours. The village community, as an informal institution, operates a more flexible governance model with voluntary participation in the transaction to deal with issues such as the identification and storage of villagers' idle land and enjoys an equity and dividend sharing of the collective economy after the completion of a transaction. Among the different tiers of government, market capital and community, the LSB has successfully integrated policies initially scattered across governmental departments to form a governance network via structural embedment. Thereby, the mechanism of LSB enhances the efficiency of governance. In this network, the combination of the “one-shoulder” mechanism bridges the gap between the formal system (hierarchy of governments and market) and the informal system (village community), enabling the villages to play an important role in land transactions. More crucial, the LSB shifted the land transactions from the informal to the formal system, thus providing institutional protection and reducing uncertainties. It should be emphasised that the collective economic institution in the LSB model has enabled the collective economy and villagers to increase their income and promote equity in distribution.

Although rural land in China is defined as collective ownership, collective ownership is an ambiguous concept. As a governance model for realizing the value of ecosystem services and ecological resources, LSB has provided a solution for dealing with unclear property rights due to the land ownership system. The LSB model adopts the functions of a “bank”, solving the problem of market failure that leads to the inappropriate provision of services (Muradian et al., 2010) by establishing a formal trading platform for relatively equal, free and voluntary transactions between sellers and buyers. The establishment of the trading platform has helped to facilitate the flow of factors between urban and rural areas.

Even if there is insufficient evidence on the role of PES in poverty alleviation (Muradian et al., 2010), many PES projects worldwide have contradicted and played out the different objectives of environmental protection, market efficiency and poverty alleviation (McAfee & Shapiro, 2010). The LSB practice has been instrumental in revitalising ecological resources, achieving ecological and environmental protection and increasing rural villagers' incomes to reduce poverty. For developing countries, due to the stages of development, PES projects should achieve both poverty reduction and environmental protection (McElwee, 2010). Otherwise, the delivery of PES projects may be challenging if raising incomes for local people is ignored.

However, the utilisation of idle land through the “*Liangshan* Bank” poses an issue of potential conflicts between proposed land use projects by land use rights purchasers or operators of idle land and territorial spatial planning, regarding the changing nature of the land functions. This issue has persisted as a longstanding problem in spatial planning. The authors would argue that the Payment for Ecosystem Services (PES) linked to land use needs to be solved on a case-by-case basis, considering the unique features of each project.

This research provides an innovative and new type of model of ecosystem services governance for effective rural land use. However, the

operation of LSB in China is still at an early stage. Due to the short period that the model has been operating, the shortcomings in the LSB mechanism have not yet been fully exposed.

In follow-up studies, it may be necessary to identify and analyse the issue of equity in the governance process of the LSB, such as how the governance mechanism affects the equity of participation and distribution and to what extent the governance of the LSB has achieved ecological protection. Some currently undiscovered issues may need to be explored in subsequent research.

### Authors statement

The authors of this manuscript have read and understood the ethical issues. The revision of the manuscript has followed the comments provided by the reviewers. The detailed responses have been uploaded.

This paper explores the operation of Value Realisation of Ecosystem Products and Services (VREPS), which is advocated as a type of payment for ecosystem services in China to increase the effectiveness of rural idle land and ecological environmental protection through a new model of ecosystem services governance, “Liangshan Bank” in Baofu, China. Our research illustrates that the new model has achieved the objectives of efficient use of land, environmental protection, and poverty alleviation through a mechanism of government-guided, market-oriented, and community participation. The research contributes to the debates on different approaches to payment for ecosystem service models worldwide.

### Declaration of competing interest

We would also declare that we have no competing financial interests or personal relationships that could have appeared to influence the research and publication of this paper.

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