

Legal Regulation of the Ecological Conversion of Water Resources

—A Case Study of Shiying Village, Anji County

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Abstract: The full implementation of the rural revitalization strategy has brought both opportunities and challenges to vast rural areas, particularly regarding the management of water resources. Anji County in Zhejiang Province is one of the birthplaces of the concept that lucid waters and lush mountains are invaluable assets. During its rural revitalization process, the county has explored numerous green development pathways, notably in Shiying Village, which the author investigated. Leveraging its abundant water resources, the village has achieved tangible economic benefits for its residents through a comprehensive conversion pathway—namely, rights confirmation → valuation → storage → trading → development—and through institutional innovations in the ecological conversion of water resources, thereby realizing a fundamental transformation from dormant resource to liquid capital. Taking Shiying Village as a case study and employing field investigation methods, this paper systematically analyzes the institutional innovations in the water resource conversion process, examining legal and regulatory issues concerning the confirmation of water use rights, valuation of water resources, trading models, and benefit distribution. The study finds that while the village has achieved institutional innovations, it also faces legal challenges such as insufficient legal basis, lack of norms for rights confirmation, non-uniform valuation standards, and inadequate regulatory frameworks. This paper proposes the establishment and improvement of a comprehensive legal regulatory system for the ecological conversion of water resources, thereby providing legal safeguards for water resource conversion in the context of rural revitalization.

Keywords: water resources; ecological conversion of water resources; legal regulation; rural revitalization

1. Statement of the Problem

In October 2017, the 19th National Congress of the Communist Party of China proposed the implementation of the rural revitalization strategy, with its core objectives encompassing five dimensions: industrial prosperity, ecological livability, refined rural civility, effective governance, and affluent living standards. This requires that the process of rural revitalization simultaneously achieves both lucid waters and lush mountains and invaluable assets. The question then arises as to whether these two

concepts are commensurate and whether an effective conversion can be achieved between them, thereby realizing the vision that lucid waters and lush mountains are invaluable assets. Ecological revitalization thus constitutes a crucial pillar of rural revitalization. The report of the 20th National Congress of the Communist Party of China explicitly called for establishing a mechanism for realizing the value of ecological products and improving the ecological protection compensation system, providing clear direction for the value conversion of ecological resources. For rural areas, water resources are among the most prevalent and promising ecological assets with development potential. Therefore, the effective conversion of the ecological value of water resources directly affects the realization of industrial revitalization, ecological revitalization, and common prosperity in rural areas.

However, vast rural areas have long faced the predicament of living in poverty despite possessing lucid waters and lush mountains. A large quantity of water resources remains underutilized; apart from meeting basic agricultural irrigation and domestic water needs, numerous mountain ponds, reservoirs, rivers, and streams lack effective value conversion pathways and remain dormant assets. How to transform lucid waters and lush mountains into invaluable assets is both an economic issue and a legal one—involving a series of legal issues such as the definition of property rights in water resources, value assessment, market trading, and benefit distribution, all of which require resolution and improvement.

Anji County, Zhejiang Province, is the very place where the concept of lucid waters and lush mountains are invaluable assets was first articulated, and it ranks among the national leaders in the ecological conversion of water resources. Shiyang Village, under the jurisdiction of Changshuo Sub-district, is a typical example of this success. According to the author's field investigation on May 25, 2026, the village has utilized its water resources sourced from bamboo forests, entrusting the unified management of the development rights for its water ecology over the past 20 years to the County Water Investment Company, thereby realizing the actual value conversion of its lucid waters and lush mountains into invaluable assets and achieving favorable economic outcomes for the villagers.

During the investigation, the author, as a lawyer, contemplated a series of legal questions: How should property rights in water resources be attributed—to the state or to the collective? How should the value be determined during the conversion process? What rules should be observed in market transactions? How should the proceeds be distributed among the government, the village collective, enterprises, and villagers? These questions are not only relevant to the replication and promotion of Shiyang Village's experience but also to the legal pathway for realizing the value conversion of water resources in rural revitalization.

Taking Shiyang Village, Anji County as an example, this paper examines the institutional innovations in its ecological conversion of water resources through field investigation, analyzes the legal issues encountered, and explores feasible pathways for establishing a legal system for the ecological conversion of water resources, with the aim of providing theoretical foundations and legal recommendations for ecological value conversion in rural revitalization.

2. Field Investigation of the Ecological Conversion of Water Resources in Shiying Village

2.1 Inherent Advantages and Ecological Value of Water Resources in Shiying Village

Shiying Village is an administrative village under Changshuo Sub-district, Anji County, Huzhou City, Zhejiang Province. It is situated at the junction of Anji, Deqing, and Yuhang counties, a typical mountainous village nestled among verdant hills and clear waters. The village has a total area of 14.6 square kilometers, comprising 9 villagers' groups, with 494 households and a population of approximately 1,676. The village features diverse forms of water resources, including streams, mountain ponds, and reservoirs, forming a unique aquatic ecosystem.

However, previously these high-quality water resources mainly served the villagers' daily needs and lacked effective development, utilization, and value conversion. There was also the 18-Bend Drifting project, which was directly cooperated between the village collective and an entrepreneur, but the annual dividend was only about 100,000 yuan, significantly undervaluing the village's water resources.

2.2 The Conversion Pathway

How did Shiying Village carry out reform, innovation, and water resource conversion? The core was the exploration of a systematic conversion pathway. According to the County Water Resources Bureau, the pathway was developed as delineation of specific watersheds → value assessment and evaluation → storage and trading → development and trading, along with corresponding procedural manuals.

Step 1: Rights Confirmation. Rights confirmation is the foundation of water resource conversion. Zhejiang Province implemented water use rights and incentive water pricing, and Anji County, as a pilot reform county, launched a reform of water use rights for mountain ponds and reservoirs. Shiying Village was the first to obtain a water abstraction permit, securing an annual water volume usage right of 76,000 cubic meters for Longfengshan Pond. Through certification, the water rights of rural collective mountain ponds were confirmed and registered.

Step 2: Valuation. After rights confirmation, the value of the water resources needed to be assessed. Through investigation and verification, the total value of all water ecological products in Shiying Village over a 20-year development and operation period was estimated at approximately 100.8 million yuan, covering all water ecological products within the 14.6-square-kilometer area, including the 18-Bend Drifting and Qimeng Island projects. Subsequently, Anji County also issued the nation's first accounting method for the value conversion of soil and water conservation ecological products, taking the lead in clearly defining the concept and value accounting system for such products.

Step 3: Storage. After rights confirmation and valuation, the County Water Investment Company undertook unified management and storage. The Anji County Water Investment Company deposited the entire 20-year development and operation rights of Shiying Village's water ecological products at a price of 100.8 million yuan. This approach facilitated holistic development and enabled unified management and upgrading of idle resources, infrastructure, and the village's living environment.

Step 4: Trading and Development. After unified storage, the Water Investment

Company then re-traded the operation rights to other market operators, co-developing and sharing benefits with market entities. The Water Investment Company upgraded the 18-Bend Drifting project and entered into a cooperative operation with Zhejiang Anji Hongying Tourism Development Co., Ltd., with profit sharing according to agreed proportions. Subsequently, Shiyong Village transferred and traded the 76,000 cubic meters of water usage rights, collaborating with Zhejiang Anji Hongying Tourism Development Co., Ltd. to develop the Qimeng Island cultural tourism project, attracting external capital. Within just five months, the project attracted returned overseas student and project manager Feng Yuteng, who worked with the village to transform Qimeng Island into a multi-project complex encompassing paddleboarding, coffee camping, and woodland skateboarding.

2.3 Institutional Innovations

The achievements of Shiyong Village are mainly attributable to its institutional innovations:

2.3.1 The state- owned enterprise storage + market development combined secondary- trading innovation.

Anji proposed the 1234 mechanism: one comprehensive assessment, two transparent transactions, three types of certificate confirmation, and a balance of four interests. This secondary trading model avoids vicious competition while improving resource utilization efficiency. This approach uses state-owned enterprises as the main organizational force to integrate resources, while leveraging market forces for specific operations, constituting the most effective arrangement for water allocation and utilization.

2.3.2 Establishment of a government guidance + collective shareholding + market- oriented operation tripartite win- win model.

Water resource projects have long suffered from the industry problem of emphasizing construction over operation. Anji innovated this new model. Previously, the village only received about 100,000 yuan in dividends, but after adopting this model, the collective income rose to 2 million yuan, a 16-fold increase.

2.3.3 Construction of a multi- level benefit- linking mechanism combining employment stimulation + asset dividends + industrial linkage.

Through resource equity participation, the village collective provided over 120 job opportunities for villagers, increasing per capita income by 30,000 yuan. The drifting project generated household dividends exceeding 4,000 yuan on average, while also boosting farm stays and accommodation, encouraging young people to stay and start businesses.

2.4 Effects and Value

The reform in Shiyong Village has achieved remarkable results. Economically, the village collective income has significantly increased, providing a large number of jobs for villagers. Ecologically, a virtuous cycle has been formed. Beyond Shiyong Village, Anji has already implemented multiple projects for the ecological value conversion of water resources. Shiyong Village's experience has spread beyond Anji and beyond Zhejiang Province.

3. Legal Dilemmas in the Ecological Conversion of Water Resources

Although Shiyong Village's practice has achieved notable results, from a lawyer's perspective, the ecological conversion of water resources still faces a series of deep-seated legal dilemmas.

The outcomes of Shiying Village's current practice are clear, but viewed through a lawyer's lens, the legal framework for the ecological conversion of water resources still has many deficiencies.

3.1 How Are Property Rights Defined?

For ecological conversion to become a reality, there must be a clear delineation of property rights. Current laws concerning ecological property rights in water resources are incomplete.

At present, the ownership boundaries of water resources remain unclear. According to Article 3 of the Water Law of the People's Republic of China, the state is the owner of water resources. However, many practical issues remain unresolved: how should mountain ponds or reservoirs occupied by rural collectives be treated? How should the boundary between state ownership and collective ownership be defined? The relevant laws do not provide clear answers. Anji's approach of using water abstraction permits to determine water resource ownership, while pragmatic, only confers water abstraction rights, which do not equate to full water use rights or operation rights. The scope of rights, conditions for transfer, and methods of protection lack clear statutory provisions.

The legal status of the operation rights for water ecological products remains ambiguous. Shiying Village uses 20-year development and operation rights for water ecological products as the subject of transactions. However, water ecological product operation rights are a new type of property right not yet explicitly recognized under current law. Should they be classified as real rights, creditor's rights, or other categories? What legal rules should govern their creation or transfer? These issues have not been answered by existing legislation. Some scholars have noted the difficulties in realizing the value of ecological products and have suggested integrating institutional experiments with local practices through a rule-of-law approach.

The object of water resources also remains unclear. The value of water resources can be both use-oriented (e.g., irrigation, drinking) and ecological (e.g., landscaping, air purification). Traditionally, only use value has been considered, while ecological value has received insufficient attention. From Shiying Village's experience, water ecological products should be interpreted broadly: water itself is one form of value, but water-related (e.g., drifting) or water-adjacent (e.g., camping) activities also embody diverse ecological values.

3.2 How Should the Value of Ecological Products Be Assessed?

Value assessment is a critical link in ecological conversion. The estimated 100.8 million yuan in Shiying Village—what methodology was used to calculate it? Currently, assessment methods lack legally binding standards. The legal system for assessment is incomplete. Value assessment of ecological products is an interdisciplinary issue (ecology, economics, law) and should be underpinned by a scientific methodology. Anji County has issued the nation's first accounting method for the value conversion of soil and water conservation ecological products, but this is a local, non-national standard with weak legal effect, and its methods—whether scientific, fair, or feasible—remain to be tested. Second, who has the authority to conduct assessments and verify the value of water resources? The law does not fully address this. Although Shiying Village has practical solutions for the methods, standards, and impartiality of assessment, there is no uniform legal basis. Third, the

binding force of assessment results is problematic. After ecological product value is assessed, it should have legally recognized binding force, serving as a fundamental basis for transactions, profit distribution, and dispute resolution. However, existing laws do not adequately address the enforceability of assessment results, potentially undermining transaction security and stability.

3.3 Imperfections in the Trading of Ecological Products

During the trading process, there are deficiencies and imperfections in the qualifications of trading entities, the legal regulation of trading procedures, and the legal mechanisms for trading supervision.

3.4 Weak Legal Safeguards for Benefit Distribution and Ecological Feedback

The ultimate purpose of the ecological conversion of water resources is to achieve the integration of ecological, economic, and social benefits, allowing those who protect the ecology to receive reasonable returns. Shiying Village has established a guaranteed floor + excess dividend model and a two types of equity participation and three types of income common-prosperity model, but these innovative benefit-sharing arrangements lack sufficient legal safeguards. First, the rules for benefit distribution are unclear: how should income from the water resource conversion process be distributed among the government, the village collective, and individuals? What are the principles and standards? These are not clearly defined. Second, the legal mechanisms for ecological feedback are inadequate. Additionally, legal protection for farmers' rights and interests is insufficient.

4. Legal Regulation of the Ecological Conversion of Water Resources and How to Improve It

In response to the above legal dilemmas, a legal regulatory system for the ecological conversion of water resources should be constructed and improved from the following aspects.

4.1 Clarify the Legal Status of Ecological Property Rights in Water Resources

For market transactions to proceed smoothly, property rights must be clearly defined. The legal status of ecological property rights in water resources should be stipulated or revised by law.

First, the operation rights for water ecological products should be included within the scope of legal regulation. It is recommended that the Civil Code of the People's Republic of China (Property Rights Part) or a special administrative regulation define water ecological product operation rights as a type of usufructuary right, with basic provisions on their creation, modification, and transfer. This right, together with land and forest use rights, should be treated as a legal, definable property right. Currently, some National People's Congress deputies have proposed enacting a Law on Promoting the Conversion of Ecological Value to legally address fundamental issues such as the attribution of ecological resources, value calculation, and benefit sharing.

Second, a more comprehensive arrangement for the confirmation and registration of water rights should be established. Based on the current water abstraction permit system, a more complete ecological property registration system should be designed and considered. From Anji's practice, the water use rights determined by water abstraction permits are a feasible method of rights confirmation. However,

supplementary provisions should be made to specify the rights and registration corresponding to various types of water ecological products (i.e., water-related, water-adjacent, or water-utilizing). A unified registration platform should be established to manage water ecological rights, ensuring publicity and credibility, thereby facilitating transaction security and validity.

Third, the realization of collective ownership of rural water resources should be clearly articulated. For water bodies such as mountain ponds or reservoirs owned by rural collectives, clear ownership and mechanisms for realization should be provided. Shiyong Village's Longfengshan Pond is a collective asset; any transfer of its water use rights must be subject to democratic resolutions in accordance with law. Legally, the subjects, procedures, and limitations for the use of rural collective water resources should be defined, balancing the satisfaction of members' rights with institutional guarantees for the rational utilization of resources.

4.2 Improve Legal Standards for the Valuation of Ecological Products

Valuation of ecological products is a fundamental institutional matter. Efforts should be made to advance the establishment of unified, reasonable, and evidence-based legal standards for the valuation of ecological products.

First, it is recommended to formulate regulations or standards for the valuation of ecological products. Drawing from Anji's experience, the state should issue technical or national standards for the valuation of ecological products, specifying the objects, procedures, methods, and reporting requirements. The various types of value (direct use, indirect ecological, and cultural) should be comprehensively captured without omission, constructing a technical system based on classified valuation and integrated analysis.

Second, the qualifications and liabilities of valuation entities should be addressed. The required qualifications of institutions engaged in ecological product valuation should be prescribed, and a certification system for valuation personnel should be established. The responsibilities of valuation units or individuals should be clearly delineated, with false reporting or errors subject to administrative or civil liability, ensuring that the valuation process and results are reasonably reliable and free from major deviations or inaccuracies.

Third, the legal status of valuation results should be established. Valuation reports prepared in accordance with statutory methods and standards should be legally recognized as a fundamental reference or basis for transaction negotiations, profit allocation, asset appraisal, or dispute resolution. At the same time, a review system and dispute resolution mechanisms should be established to ensure that the rights of interested parties are adequately protected.

4.3 Regulate the Legal Procedures for Market Transactions

Market transactions are central to the ecological conversion of water resources. It is necessary to provide clear, open, and fair legal arrangements for transactions.

First, the qualifications of trading entities should be regulated. Entities involved in the trading of water ecological products should meet specified qualification requirements. For storage, the storage rights and operations of state-owned enterprises should be standardized to prevent arbitrary exercise of administrative power. For secondary trading, access controls should be imposed on market participants, taking into account their financial standing, operational capacity, and creditworthiness as part of the

qualification criteria.

Second, appropriate trading procedures should be designed and regulated. Information disclosure, value assessment, open bidding, contract formation, and title transfer should all be incorporated into the trading procedure. Transactions must be conducted through public resource trading platforms to achieve openness, fairness, and impartiality. Anji's two open transactions approach can serve as a reference: first, unified storage by state-owned enterprises (first transaction), then market allocation (second transaction), thereby avoiding resource waste while introducing competitive development concepts.

Third, legal arrangements for transaction supervision should be studied. The trading of water ecological products should be subject to specialized supervision, with designated regulatory authorities and methods. The water resources administrative department, market regulation authorities, or natural resources management bodies should collaborate in reviewing the legality and compliance of transactions. Transaction disputes should be resolvable through mediation, arbitration, or litigation, thereby ensuring transaction security.

4.4 Improve Legal Safeguards for Benefit Distribution and Ecological Feedback

The ecological conversion of water resources is driven by benefit distribution. Efforts should be made to ensure that benefit distribution and ecological feedback are supported by fair and effective legal institutional arrangements.

First, multi-level legal rules for benefit distribution should be established. For income derived from the ecological conversion of water resources, basic principles should include: whoever invests benefits, whoever protects benefits, and a combination of fairness and efficiency. In actual distribution, the interests of the state (holding ownership of water resources), the village collective (holding actual control), enterprises (investors or operators), and villagers (protectors) should all be taken into account. Shiyang Village's guaranteed floor + excess dividend model and two types of equity participation and three types of income approach are highly instructive for institutionalizing benefit distribution.

Second, mandatory legal forms for ecological feedback should be established. By legislative design, a portion of the proceeds from water ecological product transactions should be designated for ecological protection or restoration. Anji's practice of allocating over 50% of township-level revenue to water conservancy infrastructure funds is feasible and could be extended more broadly. Additionally, ecological feedback funds should be subject to supervision and performance assessment to prevent them from becoming empty promises unrelated to ecology.

Third, legal protection for farmers' rights and interests should be strengthened. Farmers' rights and interests in the ecological conversion of water resources should be brought within the scope of legal consideration. Institutional arrangements should provide farmers with the rights to information, voice, decision-making, and income. Any transaction involving rural collective water resources should be subject to deliberation by villagers' meetings or their representative assemblies. Legal remedies should be established for situations where farmers' rights are harmed, ensuring that ecological value conversion does not exclude farmers or leave their interests unprotected or adversely affected.

5. Conclusion

The ecological conversion of water resources is a significant practice of the concept that lucid waters and lush mountains are invaluable assets and a fundamental means of transforming ecological value into economic value in rural revitalization. Nationally, Anji's Shiyang Village, with its comprehensive institutional design and outstanding reform achievements, has become a replicable and scalable typical example of the ecological conversion of water resources. From unutilized resources to circulating capital, and from stream water for washing clothes to an entire river enriching the whole village, the transformation of Shiyang Village vividly illustrates how institutional innovation facilitates the substantive conversion of ecological value.

However, the achievements of institutional innovation must be confirmed and supported by law to prevent regression. As seen in Shiyang Village, the property rights, valuation, trading, and distribution aspects of the ecological conversion of water resources still present numerous unresolved legal issues. For such practices to achieve long-term success, sound legal mechanisms must be employed to incorporate proven institutions into the legal framework, thereby forming institutional guarantees and stable rule-of-law expectations for the ecological conversion of water resources.

In the long term, legislation concerning the ecological conversion of water resources should be promoted, incorporating water ecological property rights into the legal framework, institutionalizing the valuation of ecological products, prescribing market transaction rules by law, and bringing benefit distribution and feedback under legal protection. By guiding and regulating the ecological conversion of water resources through the rule of law, places like Shiyang Village can smoothly transform lucid waters and lush mountains into invaluable assets through rural revitalization.