

NATURE-BASED SOLUTIONS IN AGRICULTURE: INSIGHTS FROM THE COMMON TRAITS OF CHINESE WHIS TERRACE SYSTEMS

LES SOLUTIONS FONDEES SUR LA NATURE EN AGRICULTURE : PERSPECTIVES TIREES DES CARACTERISTIQUES COMMUNES DES SYSTEMES DE TERRASSES CHINOIS RECONNUS COMME OUVRAGES D'IRRIGATION DU PATRIMOINE MONDIAL (WHIS)

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ABSTRACT

This study examines four ancient Chinese terrace systems—Yuanyang Hani, Shangbao, Ziquejie, and Fengyan—as outstanding historical practices of Nature-based Solutions (NbS) in mountain agriculture. Despite distinct geographical locations and cultural backgrounds, these World Heritage Irrigation Structures (WHIS) share core eco-engineering philosophies. They utilize scientific site selection to create a highly stable three-dimensional “forest-village-terrace-river” spatial layout. Furthermore, they employ “micro-intervention” gravity irrigation networks, integrated water-soil conservation mechanisms, and flexible, community-based water management systems. Notable examples include the Hani people's wood-carved water division and the Fengyan terraces' water share registries, which effectively ensure fair resource distribution and grassroots co-governance.

The systems also exhibit unique characteristics shaped by diverse historical driving forces and ethnic cultures. While Ziquejie relies entirely on natural bedrock fissure water, Fengyan utilizes a specific “field-canal-pond-stream” storage system developed by Qing Dynasty immigrants. The Hani terraces represent indigenous minority nature worship and ancient ecological knowledge, whereas Shangbao reflects the enduring pioneering traditions of the Hakka people.

These ancient systems offer profound insights for contemporary global challenges. They demonstrate how low-impact development and ecological circulation can maintain environmental balance in fragile mountainous regions. By promoting resilient agriculture and sustainable practices—like the Hani's rice-fish-duck co-culture and Fengyan's rice-rapeseed crop rotation—these terraces provide strategic models for ensuring national food security, combating extreme climate change, and reforming modern water resource governance through grassroots stakeholder autonomy. Ultimately, preserving and learning from these living fossils of farming civilization will supply invaluable historical wisdom for achieving a sustainable future.

Keywords: World Heritage Irrigation Structures (WHIS; water management systems; storage system; climate change; modern water resource governance.

RESUME

Cette étude examine quatre anciens systèmes de terrasses chinois — Yuanyang Hani, Shangbao, Ziquejie et Fengyan — en tant que pratiques historiques remarquables de solutions fondées sur la nature (NbS) dans l'agriculture de montagne. Malgré des sites géographiques et des contextes culturels distincts, ces ouvrages d'irrigation du patrimoine mondial (WHIS) partagent des principes fondamentaux d'ingénierie écologique. Ils s'appuient sur une sélection scientifique des sites pour créer un agencement

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spatial tridimensionnel très stable «forêt-village-terrasse-rivière». En plus, ils engagent des réseaux d'irrigation gravitaire basés sur «micro-intervention», des mécanismes intégrés de conservation de l'eau et des sols, ainsi que des systèmes de gestion de l'eau flexibles et communautaires. Parmi les exemples notables, on peut citer le système de répartition de l'eau sculpté dans le bois par le peuple de Hani et les registres de partage de l'eau des terrasses de Fengyan, qui garantissent l'efficacité d'une distribution équitable des ressources et d'une co-gouvernance communautaire.

Ces systèmes présentent également des caractéristiques uniques façonnées par des forces majeures historiques et des cultures ethniques diverses. Alors que le système de Ziquejie dépend surtout de l'eau de diacalse naturelle du substrat rocheux, celui de Fengyan utilise un système de stockage spécifique «champ-canal-étang-courant», mis au point par des immigrants sous la dynastie Qing. Les terrasses du système de Hani incarnent le culte de la nature propre aux minorités autochtones et un savoir écologique ancestral, tandis que le système de Shangbao reflète les traditions pionnières pérennes du peuple de Hakka.

Ces systèmes anciens offrent des perspectives profondes pour relever les défis mondiaux contemporains. Ils démontrent la manière dont le développement à faible impact et la circulation écologique peuvent maintenir l'équilibre environnemental dans les régions montagneuses fragiles. En favorisant une agriculture résistante et des pratiques durables — telles que la culture associée de riz-poisson-canard chez les Hani et la rotation des cultures de riz-colza à Fengyan — ces systèmes de terrasses constituent des modèles stratégiques pour garantir la sécurité alimentaire nationale, lutter contre les effets extrêmes du changement climatique et réformer la gouvernance moderne des ressources en eau grâce à l'autonomie des parties prenantes locales. En fin, la préservation des «fossiles vivants» de la civilisation agricole et les leçons tirés nous apportera une sagesse historique inestimable pour la concrétisation d'un avenir durable.

Mots-clés : Ouvrages d'irrigation du patrimoine mondial (WHIS); Systèmes de gestion de l'eau; Systèmes de stockage; Changement climatique; Gouvernance moderne des ressources en eau.

I. INTRODUCTION

Throughout the history of human civilization, survival and reproduction have always been closely linked to the utilization of water resources and the development of land. Since ancient times, constrained by limited plains and driven by the need to escape wars and famines, ancient Chinese ancestors turned their eyes to the vast mountains. With astonishing wisdom and perseverance, they carved out magnificent stepped farmlands—terraces—deep in the mountains. Across the vast territory of China, from the Ailao Mountains in the southwest to the Luoxiao Mountains in the southeast, and from the Xuefeng Mountains in Hunan to the Fenghuang Mountains in the Qinling-Daba hinterland, numerous breathtaking ancient terrace irrigation engineering heritages have been left behind. These structures are not only great miracles in the history of world agricultural civilization but also a vivid portrayal of humanity seeking survival and conforming to nature under extremely harsh natural conditions.

In the context of addressing global ecological crises such as climate change, resource shortages, and soil erosion, the concept of “Nature-based Solutions” (NbS) has emerged. NbS emphasizes addressing social challenges effectively and adaptively through the protection, sustainable management, and restoration of natural or modified ecosystems, while simultaneously providing human well-being and biodiversity benefits. In this regard, China's terrace irrigation engineering heritages are outstanding practices of NbS in ancient water conservancy engineering and mountain agriculture. This paper focuses on four typical ancient Chinese terraces that have been declared World Heritage Irrigation Structures (WHIS)—Yuanyang Hani Terraces in Yunnan, Shangbao Terraces in Jiangxi, Ziquejie Terraces in Hunan, and Fengyan Terraces in Shaanxi. By thoroughly reviewing their historical evolution, engineering systems, socio-cultural, and ecological values, and extracting the common laws and individual characteristics of these four major projects, this study aims to uncover the ancient wisdom of “harmony between humanity and nature, and between humans and water.” This provides profound insights and historical references for the high-quality development of modern agriculture, the safeguarding of global food security, and the maintenance of regional ecological balance.

II. OVERVIEW OF THE FOUR WHIS TERRACE SYSTEMS

(I) *Yuanyang Hani Terraces: The Miracle of the “Four-Element Isomorphism” in the Ailao Mountains*

Yuanyang Hani Terraces are located in the Ailao Mountains in southern China, within Yuanyang County, Honghe Hani and Yi Autonomous Prefecture, Yunnan Province. It encompasses the Bada, Duoyishu, and Laohuzui areas, where the Hani terraces are the largest and most concentrated. The entire declared heritage area covers 16,603.58 hectares, including 3,741.05 hectares of terraces.

The history of the Hani Terraces traces back to the Tang Dynasty in the 8th century. According to the Tang Dynasty document *Man Shu: Local Products of Yunnan* (completed in 863 AD): “The barbarians manage mountain fields exceedingly well... irrigation entirely relies on spring water, ensuring no damage from drought or flood.” *The Nanzhao Dehua Stele* also notes, “Overcoming perilous terrains and floods, plateaus are turned into fields for rice and millet.” In the early Tang Dynasty, the ancestors of the Hani people migrated to the south bank of the Red River in the Ailao Mountains via the “Butou Route,” transitioning from nomadism to agriculture and beginning to reclaim terraces along the mountain contours. After the “joint reclamation by soldiers and civilians” during the Yuan and Ming dynasties, and large-scale expansion in the Qing Dynasty, it finally formed the magnificent cascading landscape seen today. The Qing Dynasty’s *Dian Nan Zhi Lue* recorded: “When the mountains become extremely steep, one must climb step by step; there are stone steps, named ‘terraced fields’.”

Regarding its engineering system, the Hani Terraces have shaped a “four-element isomorphism” comprising “forest-village-terrace-river system,” forming a three-dimensional spatial pattern of production, living, and ecology centered on water. In this highly stable ecosystem, towering forests act as massive “green reservoirs” and “underground reservoirs,” intercepting precipitation and nurturing perennial mountain springs. The water flows down into villages built on the mountainside, utilized for residents’ domestic needs and to power hydraulic machinery such as water mills and water trip-hammers. Subsequently, the water is guided by a crisscrossing canal network into the cascading terraces below the villages. The Hani ancestors ingeniously invented a gravity irrigation method of “series irrigation and drainage” and adopted a highly contractual “wood-carved water division” or “stone-carved water division” system for water allocation. Due to the retaining effect of the field ridges, the terraces themselves act like giant reservoirs, possessing multiple functions of flood peak regulation and rainwater storage. Finally, the surplus water converges into lowland rivers like the Red River and Tengchao River, evaporating under high temperatures into clouds and mist, which then precipitate back onto the high mountain forests, forming an endless cycle of water resource utilization.

(II) *Shangbao Terraces: The Representative of Hakka Steep-Slope Terrace Farming Civilization*

Shangbao Terraces are located in the southern section of the Luoxiao Mountains in the northwest of Chongyi County, Ganzhou City, Jiangxi Province, with the core area situated in the Qiyun Mountain Scenic Area, the highest peak in southern Jiangxi. It is not only the largest Hakka rice terrace in China but also certified by Shanghai Great World Guinness as the largest Hakka terrace nationwide. The Shangbao Terraces cover a total area of about 3,400 hectares, with a vertical drop of nearly 1,000 meters and up to 62 terrace tiers. Its large-scale contiguous areas cover the three townships of Shangbao, Sishun, and Fengzhou, centered around the five major zones of Shuinan, Zhuxi, Chishui, Lianghe, and Zhengjing, demonstrating the Hakka people’s masterful farming wisdom.

The construction history of Shangbao Terraces is inseparable from the migration of Hakka ancestors. Starting in the Southern Song Dynasty, Hakka ancestors gradually migrated into these rugged mountains to escape war. In the 12th year of the Zhengde reign of the Ming Dynasty (1517 AD), the great philosopher Wang Yangming established Chongyi County here, meaning “advocating righteousness.” Throughout the long river of history, the Shangbao Hakka people reclaimed land and built fields on extremely steep slopes. Most of the terraces here are steep-slope terraces, demanding extremely high engineering stability and erosion resistance. To achieve effective irrigation, the Hakka people also built a mountain agriculture system of “forest-village-terrace-river,” adopting a layered implementation concept of “storing water at the mountaintop, using water for living on the mountainside,

and planting fields to conserve soil at the mountain foot.” They ingeniously utilized primitive natural materials such as bamboo pipes, stones, and local soil to build water conservancy facilities, achieving both safety and environmental protection. Water is drawn from streams and supplemented layer by layer along the terraces, ensuring the terraces are free from drought. A local folk song even sings: “Shangbao, Shangbao, the water is abundant on the high mountaintops.” At the same time, Shangbao Terraces retain a large amount of intangible cultural heritage, such as the “Spring Ox Dance,” “Reporting to the Sages,” and “Hunting Wine Culture,” serving as a “living fossil” of Hakka farming civilization.

(III) Ziquejie Terraces: The Miracle of Pure Natural Gravity Irrigation without Ponds

Ziquejie Terraces are located in Shuiche Town of the Xuefeng Mountains in the western part of Xinhua County, Loudi City, Hunan Province, situated in the Zishui River basin, a secondary tributary of the Yangtze River. The total irrigated area reaches 6,416 hectares, with over 500 tiers and slopes ranging from 25 to 40 degrees. With a history of over 1,000 years, the Ziquejie Terraces began to take shape in the Song Dynasty and reached their peak during the Ming and Qing Dynasties. They are the crystallization of the joint creation by multiple indigenous ethnic groups, including the Han, Miao, Yao, and Dong. The reclamation of this terrace occurred during the peak of ancient China's population growth. To resolve the contradiction between population expansion and food shortages, it pioneered the organic integration of food production and soil conservation in sub-alpine regions.

The most distinctive feature of the Ziquejie Terrace irrigation system is its “no reservoir, no pond” model, relying entirely on the abundant underground fissure water conserved by forests and surface mountain springs for gravity irrigation. The Ziquejie mountains have lush vegetation and soils composed of granite-weathered sandy loam with deep organic matter, possessing an extremely strong water conservation capacity. The ancestors built small weir dams about 1 meter high on mountain streams to intercept water, overflow floods, and discharge sand, leading water into the fields through a capillary network of earthen canals (gouzhun) totaling 153.46 kilometers. To adapt to the steep terrain and reduce erosion on field ridges, the Ziquejie ancestors extensively used the “borrowing fields for water conveyance” method, utilizing the narrow, elongated fields themselves as water conveyance channels for adjacent fields. When needing to cross isolated peaks or ravines, they sourced local materials, using bamboo to make small aqueducts for water conveyance. These simple yet efficient engineering facilities, combined with the natural stream drainage network, have maintained the effective operation of the system for thousands of years with minimal engineering volume and artificial intervention, acting as a paradigm of harmonious coexistence between humans and nature.

(IV) Fengyan Terraces: A Masterpiece of Immigrant Land Reclamation in the Qinling-Daba Mountains via the “Field-Canal-Pond-Stream” System

Fengyan Terraces are located on the southern foot of the Fenghuang Mountains in Xuanwo Town, Hanyin County, in the Qinling-Daba mountainous region of southern Shaanxi Province, with a total irrigated area of about 3,410 hectare. Fengyan Terraces are not only the largest and most intact ancient terraces discovered in the Qinling-Daba Mountains to date but also a product of the fusion between Chinese immigrant culture and farming civilization. Hanyin has been renowned as the “Hometown of Baoweng” since ancient times, as the allusion from the *Zhuangzi*: Heaven and Earth chapter, “Zigong passed by Hanyin and saw an old man carrying an urn out to irrigate,” originated here. From the urn irrigation of the pre-Qin period to the later shadoof and bamboo waterwheels, and finally to the weir canals of the Ming and Qing dynasties, the Hanyin region has left a clear trajectory of water conservancy technology evolution.

The large-scale construction of the Fengyan Terraces began during the Qianlong reign of the Qing Dynasty. Driven by the national mass migration policy known as “Huguang filling Sichuan,” large numbers of immigrants, such as the Wu family from Shanhua County, Changsha Prefecture, Hunan, settled in Hanyin. Faced with a desolate situation where “officials were appointed but there were no households to govern, and land lay barren with no strength to cultivate,” the immigrants, encouraged by the local government, reclaimed wastelands and channeled water to plant rice. Along streams like Huanglong Gully, Cigou, Lengshui Gully, and Longwang Gully on the ridge of the Fenghuang Mountains,

they followed the terrain and built over 300 tiers of terraces stretching for tens of thousands of mu (15 mu=1 hectare). The irrigation system of the Fengyan Terraces evolved into an extremely unique “field-canal-pond-stream” system: streams flow down from high mountains, are channeled into ponds located at flat spots among the terraces, and are then distributed from the ponds to the field plots. Ponds, canals, streams, and terraces are interconnected like blood vessels, forming a natural sponge construction concept. Simultaneously, the village site selection fully reflects the traditional Chinese philosophy of “bearing yin and embracing yang.” Backed by the Fenghuang Mountains to ward off the cold northwest currents, and facing the broad Hanjiang River valley to the south to welcome sunlight and moisture, it achieves a perfect balance of safety and production.

III. ANALYSIS OF THE COMMON TRAITS OF THE FOUR WHIS TERRACE SYSTEMS

Although the Hani, Shangbao, Ziquejie, and Fengyan ancient terraces differ in geographical location and building ethnic groups, they demonstrate highly consistent core wisdom and common traits when combating harsh natural conditions. These commonalities are the ancient Chinese practices of Nature-based Solutions (NbS), fully interpreting the sustainable development philosophy of “harmony between humanity and nature.”

(I) *Scientific Site Selection and 3D Spatial Layout Conforming to Nature*

In macro-spatial layout, all four major terraces present a highly rational ecological vertical hierarchical structure. Whether it is the “four-element isomorphism” of Hani, the “layered implementation” of Shangbao Terraces, or the “bearing yin and embracing yang” pattern of Fengyan Terraces backed by the Fenghuang Mountains, they strictly divide the mountain system into ecological niches with different functions. The mountaintops and high-altitude areas are strictly protected as water conservation forests. These pristine vegetations constitute massive natural reservoirs, playing roles in water conservation, soil retention, water purification, and climate regulation. Villages are often placed on gentle slopes halfway up the mountains, allowing close access to living source waters while avoiding valley floods and mountaintop severe colds. The foothills and lower gentle slopes are reclaimed as terraces, which not only intercept surface runoff but also stabilize the slopes through rice cultivation. This three-dimensional pattern of production, living, and ecology, with “water as the link and forest as the foundation,” conforms to natural topography and minimizes destruction to the original natural landscape.

(II) *“Micro-Intervention” Gravity Irrigation and Drainage System*

Mountain terrace water conservancy projects must overcome enormous elevation differences and complex terrains. None of the four major terraces relied on massive river-blocking dams; instead, they adopted “micro-intervention” engineering means with minimal interference to nature. The “small stream weir dams” in Ziquejie are only 2 to 3 meters long, requiring no dedicated maintenance normally, and naturally discharging flood peaks during rainstorms. In the water conveyance systems, the Hani Terraces dug canals along contour lines using cut-and-fill methods, Ziquejie adopted “borrowing fields for water conveyance,” and both Shangbao and Ziquejie sourced local materials to use natural water diversion facilities like “bamboo pipes” and “wooden troughs” when crossing ravines. Within the terraces, all four projects commonly utilized the “series irrigation and drainage” model. Water flows naturally from top to bottom by gravity through drainage outlets dug on field ridges. This not only ensures water replenishment for all terraces but also greatly dissipates the erosive kinetic energy of the water flow through stepped buffering, preventing soil erosion.

(III) *Integrated Water-Soil Conservation and Ecological Circulation Mechanism*

In terrace systems, the terraces are not merely carriers of agricultural production; they are also massive water resource regulation facilities and artificial wetlands. The thick field ridges of the Hani and Ziquejie terraces turn every single field into a micro-reservoir. During the rainy season, the terraces intercept rainfall and attenuate flood peaks; during the dry season, the moisture stored in the terraces and soil is slowly released to regulate the local microclimate. Fengyan Terraces creatively embedded “ponds and cellars” within the system, connecting natural streams with artificial ponds to achieve “natural

accumulation, natural infiltration, and natural purification.” Moreover, terraces largely implement ecological engineering methods and organic fertilization. For instance, the “hydraulic fertilizer flushing” technique created by the Hani people accumulates livestock and poultry manure from villages in ponds and flushes it into the terraces with water during spring plowing. This solves village sewage issues while completing an ecological closed loop of integrated water and fertilizer. Shangbao Terraces employ local methods such as using poultry to catch pests and scattering plant ash for pest control, forming an extremely benign agricultural ecological cycle.

(IV) Flexible Social Water Management System in Line with Village Regulations

Maintaining such massive and complex mountain irrigation systems requires scientific and fair social management systems. None of the four major terraces relied entirely on official authoritarian management. Instead, based on blood ties, patriarchal clans, or village communities, they established a set of flexible village regulations. The Hani Terraces used “wood-carved water division” and “stone-carved water division” to quantify water rights, and elected “ditch runners” and “forest rangers,” closely linking water resource allocation with religious worship (water god worship, forest worship). The Fengyan Terraces erected the *Fengting Weir Public Water Release Regulations Stele*, standardizing behaviors like water allocation by acreage, work-for-relief, and severe punishment for water theft in the form of a stele inscription. Water allocation in the Ziquejie Terraces also relies on rural autonomy, constrained by customary pacts commonly observed by water users. This grassroots co-governance water rights management system effectively avoided water disputes and ensured timely and regular repair and dredging of water conservancy facilities.

IV. INSIGHTS FOR MODERN AGRICULTURE, FOOD SECURITY, AND ECOLOGICAL BALANCE

In today's world of intensifying global climate change, severe land degradation, and increasingly tense water resources, the “nature-based” thinking embodied in these four World Heritage Irrigation Structures provides us with extremely valuable guidance and references for solving modern agricultural and ecological challenges.

(I) Guidance for Maintaining Ecological Balance and Environmental Protection

The three-dimensional spatial structure of the “forest-village-terrace-river system” of the four major terraces provides the best demonstration of NbS for modern comprehensive watershed management and ecological restoration. Firstly, the terrace system proves that “protecting the upstream water conservation forest” is a prerequisite for maintaining the water resource balance of the entire basin. In modern ecological construction, we must adhere to closing hillsides to facilitate afforestation and returning farmland to forests, treating forests as the largest natural reservoirs. Secondly, the terrace system demonstrates how to conduct “low-impact development.” Terraces are reclaimed along contour lines without destroying the mountain's structure, using degradable natural materials like earthen canals and bamboo pipes for water conservancy construction, truly achieving natural purification and infiltration. Contemporary engineering construction should abandon over-reliance on concrete hardening, learn from ancient people's natural circulation model of integrated water and fertilizer (such as the hydraulic fertilizer flushing in Hani Terraces), reduce agricultural non-point source pollution, and restore the land's own ecological metabolic capacity.

(II) Reference for Current Sustainable Agricultural Development

Modern agriculture relies heavily on chemical fertilizers, pesticides, and fossil fuels, leading to soil compaction and biodiversity loss. The rice farming systems of China's ancient terraces demonstrate an environmentally friendly sustainable path. For example, the “rice-rapeseed crop rotation” adopted temporarily by Fengyan Terraces not only increases land utilization but also naturally breaks the cycle of pests and diseases. The “rice-fish-duck” integrated farming model currently heavily promoted in Yuanyang Hani Terraces perfectly combines planting and breeding; ducks and fish eat weeds and pests, and their manure fertilizes the fields, greatly reducing chemical pesticide use. This compound

agricultural system not only produces high-quality agricultural products (like the famous terrace red rice) but also maintains a rich biological gene pool. Contemporary agriculture should actively promote ecological engineering methods like three-dimensional cultivation and crop rotation with fallow periods, cultivate multi-functional agricultural cultural landscapes, and develop integrated economies of “agriculture + culture + tourism” (such as Yuanyang’s Azheke Plan, which tightly links terrace protection with villagers’ dividends), thereby achieving a win-win for both economic and ecological benefits.

(III) Strategic Significance for Ensuring National Food Security

The history of terrace reclamation is essentially a survival history of the Chinese nation demanding grain from mountains to resolve the contradiction between population and land. Today, as arable land resources remain scarce in China, the terrace development concept of “when fields end, land is used; when land ends, mountains are used” offers profound enlightenment for safeguarding the 120 million hectare arable land red line. On one hand, rationally protecting and restoring historical terraces and vitalizing abandoned mountain resources can effectively increase total regional grain output.

The Ziquejie Terraces achieved food self-sufficiency on steep slopes at an altitude of 1,200 meters, and the 51,200 mu irrigated area of Fengyan Terraces continues to exert productive utility today, proving the massive potential of mountain agriculture. On the other hand, facing increasingly frequent extreme climate events (droughts and torrential rains), the terrace itself is a massive system for water storage, moisture conservation, drought resistance, and flood control. Compared to the single, fragile agricultural structure of plains, terrace systems possess extremely high climate resilience. Even in drought years, they can maintain crop growth through underground soil seepage. This “resilient agriculture” model is an important line of defense for ensuring the security of future food systems.

(IV) Governance Reflections on Modern Water Resources Management

The persistence of ancient terraces relies on meticulous and fair social water rights management. Whether it is the “wood-carved water division” of the Hani people or the “water share registry” of the Fengyan Terraces, they reflect ancient mechanisms for precise measurement and fair distribution under conditions of water scarcity. At the same time, positions such as “weir heads” and “ditch runners” elected by villagers established a grassroots autonomy model with joint participation by stakeholders. This provides a profound historical origin for the “River Chief System,” “Forest Chief System,” and comprehensive agricultural water pricing reforms promoted in current water resources management. In modern water governance, we must not only rely on technological means but also focus on rebuilding the contractual spirit of communities, establishing a transparent, open, and benefit-sharing water rights distribution system, making water users the main body of water resource protection.

V. CONCLUSION

From the Hani Terraces in Yunnan to the Shangbao Terraces in Jiangxi, and from the Ziquejie Terraces in Hunan to the Fengyan Terraces in Shaanxi, these four World Heritage Irrigation Structures span the long history of the Tang, Song, Yuan, Ming, and Qing dynasties. They bear witness to the great journey of the Chinese nation conforming to and modifying nature across different regions and ethnic backgrounds. They are not merely static ruins but “living fossils” that continue to nourish millions of people today. These ancient terrace irrigation systems vividly interpret the profound connotations of “Nature-based Solutions.” Facing today’s complex ecological and food challenges, re-examining and learning from these ancient wisdoms passed down through millennia, and protecting, inheriting, and utilizing them well, will inevitably provide inexhaustible historical power for humanity to achieve a sustainably developed future.

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