

Visual Transformation and IP Development as Approaches to Agricultural Heritage Conservation: A Case Study of the Hani Rice Terraces

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Abstract

This paper asks whether visual transformation and intellectual property (IP) development can provide new ways to address the central challenge in Globally Important Agricultural Heritage Systems (GIAHS) conservation—how to keep heritage "alive" while also making it sustainable. We use the Honghe Hani Rice Terraces in Yunnan as our case. The analysis looks at the composite and dynamic nature of agricultural heritage, and the practical problems that conservation efforts are now facing. We argue that design-based translation and cultural branding can be useful tools for heritage protection. We propose a four-stage pathway: collecting cultural landscape resources, refining and symbolizing them, designing a core IP image and system, and finally embedding that IP system into the local community. The key idea is to re-express the ecological and cultural values of heritage through modern visual language and brand stories, and spread these through digital media. This approach keeps the "living" quality of heritage while allowing change, encourages community involvement and benefit sharing, and gives both a new theoretical view and practical guidance for adaptive management of agricultural heritage.

Keywords

Agricultural Heritage; Hani Rice Terraces; Visual Transformation; IP Development; Dynamic Conservation.

1. Introduction

1.1. The Concept of Agricultural Heritage and Its Global Significance

The Globally Important Agricultural Heritage Systems (GIAHS) program was started by the Food and Agriculture Organization (FAO) in 2002, with support from the Global Environment Facility (GEF). The FAO defines GIAHS as "remarkable land use systems and landscapes which are rich in globally significant biological diversity evolving from the co-adaptation of a rural community with its environment and its needs and conditions for sustainable development." What matters most here is that this heritage is not just about farming. It includes biodiversity, local knowledge about water and soil, farming techniques, and the social and cultural systems that support them. Agricultural heritage is a special kind of land use and landscape that has come out of long interaction between people and nature. It shows how rural settlements, farming, and the environment have co-evolved and adapted to each other over time. These systems are not old relics that stay the same. They are dynamic social-ecological systems that keep adjusting to new conditions, and they can maintain or recover their functions after disturbances—a quality known as resilience[12]. So conserving agricultural heritage means protecting a living system that is still working, still changing, and closely connected to local

people's lives and cultural identity. The aim is to achieve dynamic conservation and adaptive management[1], so that the heritage can develop in a sustainable way.

1.2. Concepts of Visual Transformation and IP Development

Cultural ecosystem services from agricultural landscapes have drawn more and more academic interest in recent years. Among these, aesthetic service is seen as especially important. Making agricultural landscapes look better is becoming a key reason for developing them[15]. In design studies, visual transformation is about turning abstract cultural meanings, spiritual values, or traditional knowledge into visual symbols, images, or systems that people can see and understand. This is done through refinement, simplification, and creative work. For cultural heritage, visual design translation[3] helps bring heritage into modern life and make it easier to communicate. In the cultural and creative industries, IP (intellectual property) development means finding cultural resources that have promise, turning them into core IP images or brands that people recognize and feel connected to, and then using them across different media and products to increase their value. For regional culture, brand IP design is a step-by-step process: from collecting local cultural content to extracting key elements and symbols, and then deciding the core positioning of image, behavior, and personality[4]. Bringing visual transformation and IP development into agricultural heritage conservation changes how we think about heritage. Instead of just keeping it as it is, we see it as cultural capital that can be told in new ways and whose value can grow through design in today's cultural and economic systems.

So we need to ask: can visual transformation and IP development offer a new path for the "living conservation" and sustainable development of agricultural heritage? And can their methods—design translation and brand storytelling—deal with the tensions between tradition and modernity, and between conservation and development? Using the Honghe Hani Rice Terraces in Yunnan as our example, we try to build a practical pathway—from collecting resources and refining symbols to designing an IP system and bringing it into the community—and we look at whether this can work in practice.

2. Problems Facing Agricultural Heritage Conservation

2.1. Contradiction Between Heritage Revitalization and Sustainable Development

Because agricultural heritage is "living," it has to be part of today's development. But common conservation methods come with real risks. If tourism and agricultural industrialization are not planned well, they can damage the authenticity of the landscape, make ecosystems simpler, and push traditional knowledge to the side. For example, focusing too much on high-yield monoculture directly threatens the many local rice varieties that have been kept in places like the Hani Rice Terraces[5]. This hurts genetic diversity and the cultural practices that go with it. There is also an economic problem: how can heritage products and services get the higher price they deserve for their ecological and cultural value, instead of being sold cheaply without a brand? This is a real issue for sustainable development. Getting agricultural heritage certification has been shown to increase tourism. In Wujiang, revenue went up by 12.5%, and in Longsheng, visitor numbers went up by 18.3%. But the two sites showed different patterns. Wujiang was more resilient because it had good cultural-tourism integration, while Longsheng was more vulnerable because it depended too much on resources and had infrastructure problems[14]. In heritage practice, protection and development are often seen as opposites, with development treated as secondary to protection[9]. We need a more careful approach—one that protects core heritage values and ecological limits while also finding new ways to express and realize those values. The Hani Rice Terraces have very high aesthetic and ecological

value, but they face threats from population pressure and changes in traditional practices[11]. This shows how sharp the tension between development and conservation really is.

Looking specifically at the Hani Terraces, we see that some areas have been abandoned in recent years. Traditional rice farming does not bring high returns and needs a lot of labor, so many young workers have left to find other jobs. Some terraces, especially those in remote areas or with poor irrigation, have been left unused and have turned into dry land or become overgrown. By 2020, there was a 31% decline, caused by land fragmentation and tourism growth. Some areas in the forested central-eastern terraces kept producing well, while the southwestern dryland margins did poorly. Land-use patterns explained 80 to 95% of the differences in yield, and temperature made things worse[13]. At the same time, tourism has brought money, but it has also made village spaces and lifestyles more commercial. Some traditional mushroom houses have been changed into modern guesthouses, and festivals like the Long Street Banquet have become performances for tourists instead of community rituals. These changes bring short-term income, but they are slowly wearing away the "living" core of the heritage.

2.2. Insufficient Community Participation in Heritage Conservation

The community is both the creator and the keeper of heritage, and its deep involvement is essential for living conservation. But in reality, communities are often treated as passive receivers or just as part of the scenery. Their knowledge, hopes, and creativity are not fully respected or used in conservation decisions and development. This lack of power creates a gap between conservation measures and community life. Younger people, who lack both cultural identity and economic reasons to stay, move away. This causes a crisis in passing on traditional knowledge that is carried through practice. Hani culture depends on a small number of custodians (like the Mopi and Bema) for oral transmission[11], and under the influence of modernization, cultural diversity is at risk. Few young people want to learn oral traditions like Hani ancient songs and the Four Seasons Production Tunes. Many traditional farming skills—like making and maintaining water-dividing wooden channels (fenshui muke) and selecting and saving traditional rice seeds—are becoming simpler or disappearing because they are not being passed down. Also, local communities often have a weak position in tourism and brand operations. Outside companies usually run the scenic areas and develop cultural products. Villagers mostly sell cheap agricultural products or do basic services, so they have little share in the benefits of brand value. This lack of participation makes the community less interested in conservation. So we need to build a mechanism that changes the community from a passive object of protection into an active subject of inheritance and development. This is key to making conservation more effective.

3. Technical Pathway for Visual Transformation and IP Development of the Hani Rice Terraces

3.1. Role of Visual Transformation and IP Development in Heritage Conservation

The terrace system is a composite ecosystem with social, economic, and natural parts, so its protection has to be comprehensive and systematic[2]. Visual transformation and IP development offer a new way to balance conservation and development. First, by turning complex heritage values into visual symbols and stories that are easy to share, design translation raises public awareness and emotional involvement, building social capital for conservation. Second, IP development helps brand heritage products, landscapes, and experiences, increasing their value and creating new market demand and economic returns. This supports a good cycle of conservation and development. Most importantly, this process is

centered on the community. It turns abstract conservation duties into creative economic and cultural activities that the community can join and benefit from. This encourages people to act on their own and creates a positive relationship, while also building local brand value from within.

3.2. Pathway Design for Visual Transformation and IP Development of the Hani Rice Terraces

3.2.1. Collection of Characteristic Cultural Landscape Resources

The first step is collecting resources. This requires looking at the Hani Rice Terraces as a complex system from many angles. The Honghe Hani Rice Terraces Cultural Landscape is in the Ailao Mountains, along the Honghe River (Red River), in the Honghe Hani and Yi Autonomous Prefecture in southeastern Yunnan, China. It is known for the special farming culture that the Hani people and other ethnic groups created by adapting to the local climate and geography[10]. The cultural landscape has three parts—forests, villages, and terraces—in a "forest-village-terrace" vertical pattern that supports ecological functions like soil and water conservation and clean water supply. The Hani Rice Terraces also have great aesthetic value. The view of terraces, clouds, and mushroom-house villages is a famous destination for tourists from China and other countries[11]. To find the resources that can be used for visual transformation and IP development, we used literature research. We searched academic papers, local records, government reports, and visual materials. We looked at CNKI, Wanfang Data, and government websites, from 2000 to 2026, using keywords like "Hani Rice Terraces," "agricultural heritage," "cultural landscape," and "terrace ecology." We also read assessment reports on the Hani Rice Terraces from the UNESCO World Heritage Centre and the FAO. Based on these sources, we organized the core resources into four areas—material landscape, biological agriculture, cultural symbols, and knowledge systems—as shown in Table 1..

Table 1. Inventory of Core Resources of the Hani Rice Terraces Cultural Landscape

Resource Dimension	Specific Resource Content	IP Development Orientation
Material Landscape	Seasonal terrace shapes and colors, forests, water networks (canals, water-dividing wooden channels), mushroom house villages, etc.	Core visual symbols and spatial foundation for IP
Biological Agriculture	Local traditional rice varieties (e.g., red rice), terrace-specific flora and fauna (e.g., silver pheasant).	Basis for specialty product IP and the ecological attributes of IP characters
Cultural Symbols	Festivals like the October Year and Long Street Banquet; oral traditions such as migration epics and Four Seasons Production Tunes; costume patterns, silver craftsmanship.	Spiritual core of IP stories, source of narrative elements and visual style.
Knowledge Systems	Ecological philosophy of "forest-village-terrace-water" four-element symbiosis; traditional farming calendars and water management regulations.	Philosophical foundation for IP character personality and brand values

Some of the resources in Table 1 have strong IP potential. The water-dividing wooden channel (fenshui muke) is a key tool in the Hani water system. Its shape and its meaning—fair distribution and community cooperation—make it good for showing IP character traits or brand values. The silver pheasant, which in Hani mythology stands for good luck, happiness,

and a bright future, and which looks elegant, can be developed as a supporting character or ecological guardian in IP. The four-element symbiosis philosophy can provide a deep worldview and value base for IP stories. These resources should be given priority in the later steps of symbol refinement and IP design.

3.2.2. Symbolization of Cultural Landscape Resources

Symbolization is the bridge between tradition and modernity. It turns concrete resources into symbolic language that can be used in modern design. Based on the resources we collected, we used methods like generalization, simplification, and exaggeration to extract[3] visual symbols that are typical of the Hani Rice Terraces. This includes: refining visual symbols—like turning the curved lines of terraces into flowing geometric patterns, or simplifying the mushroom house shape into a simple outline; building a color system—like taking the main seasonal colors of the terraces and the colors of ethnic costumes to make a theme color palette; and exploring spiritual symbols—finding the cultural core that can be the soul of IP stories. This translation is not just copying. It is creative abstraction based on real understanding. The same resource can go in different symbolization directions depending on the design goal (see Table 2).

Table 2. Hani Rice Terraces Cultural Landscape Resource Symbolization Guide Table

Resource Content	Symbolization Direction
Seasonal terraces	Abstract the layered contour curves of terraces into fluid, progressive geometric lines or patterns.
Forests, water networks	Refine the structural form of the "water-dividing wooden channel" as a symbol of equitable distribution & ecological wisdom.
Mushroom house villages	Simplify the unique architectural form (e.g., thatched roof, adobe walls) into a characteristic silhouette.
Red rice	Transform the distinctive form and color of red rice into a core produce symbol.
Terrace-specific flora and fauna	Convert symbiotic elements (e.g., "terrace fish," "paddy duck") into auxiliary symbols embodying system wisdom.
Festivals like Long Street Banquet	Extract specific actions and artifacts from Long Street Banquet scenes and rituals as visual expressions of culture & community.
Costume patterns, silver craftsmanship	Refine, generalize, and redesign Hani embroidery patterns and silver ornaments into decorative motifs with ethnic aesthetic features.
Four-element symbiosis philosophy	Design concrete or abstract graphics expressing the ecological cycle of forests conserving water and water flowing through villages to terraces.

As Table 2 shows, the same resource can lead to different symbolization paths. The water-dividing wooden channel's form can be used not just as a visual symbol but also as a graphic that stands for community governance in the IP. The silver pheasant's shape and colors can be used to create a friendly supporting character or mascot for ecological IP. A graphic showing the four-element symbiosis cycle can be the main pattern for brand logos or product packaging, showing visually the key value of "harmonious coexistence between humans and nature" that defines the Hani Rice Terraces. Through careful refinement and design translation of these resources, the IP system can have a stronger regional identity and cultural meaning.

3.2.3. Designing the Core IP Image and a Multi-dimensional IP System

After refining the symbols, we design a core IP image that carries the cultural spirit. This image should have a unique look, a clear personality, and a backstory that gives it meaning, so it can represent the Hani Rice Terraces. For example, we could create a character that combines

terrace lines, water drops, and rice panicles, with a personality that is resilient, wise, and living in harmony with nature, and a story based on Hani migration epics and ecological adaptation ideas like "village division"[11]. Such an image could connect emotionally with the public, helping the Hani Rice Terraces fit into modern trends and supporting its "living" conservation. Using the core IP image as the center, we can build a systematic, multi-level, cross-media IP application system in three areas: physical products, digital media, and IP-based tourism. For physical products, we can make cultural and creative items like stationery, clothing, and home goods with the IP image and terrace patterns. We can also set up a regional public brand for the Hani Rice Terraces that packages and certifies products like red rice, terrace fish, and tea under the IP[6]. For digital media, we can use it for deeper sharing: make animated shorts with the IP character, create social media stickers that teach terrace knowledge and culture, and use short videos and live streaming to show the real terrace views, farming, and community life behind the IP—linking the virtual IP with the real world[8]. For tourism, we can design educational travel routes and immersive light-and-shadow art shows, bringing the virtual IP into the real landscape and putting IP stories into the tourism experience, making the IP system richer.

3.2.4. Integration of the IP System with the Community

The success and sustainability of the IP system depend on whether it comes from and gives back to the community. First, when creating the IP, we need to include community elders, craftspeople, and cultural keepers in making the story, so the IP's story and spirit are true to the place[7]. Second, when running the IP, community members should be trained and supported to become IP content makers, product producers, and service providers, so IP development becomes a new source of income and jobs for the community[8]. Third, we should build online and offline "brand communities" that connect consumers, tourists, and the community through the IP. Use social media for online interaction, and set up IP-themed spaces in villages and hold IP-based festival activities offline. This lets the community get cultural pride and economic benefits from the IP's growth, changing from "protected objects" to "active subjects of inheritance and development." Through the participation of many groups, this process builds a local brand and keeps value circulating locally[6]. See Figure 1.

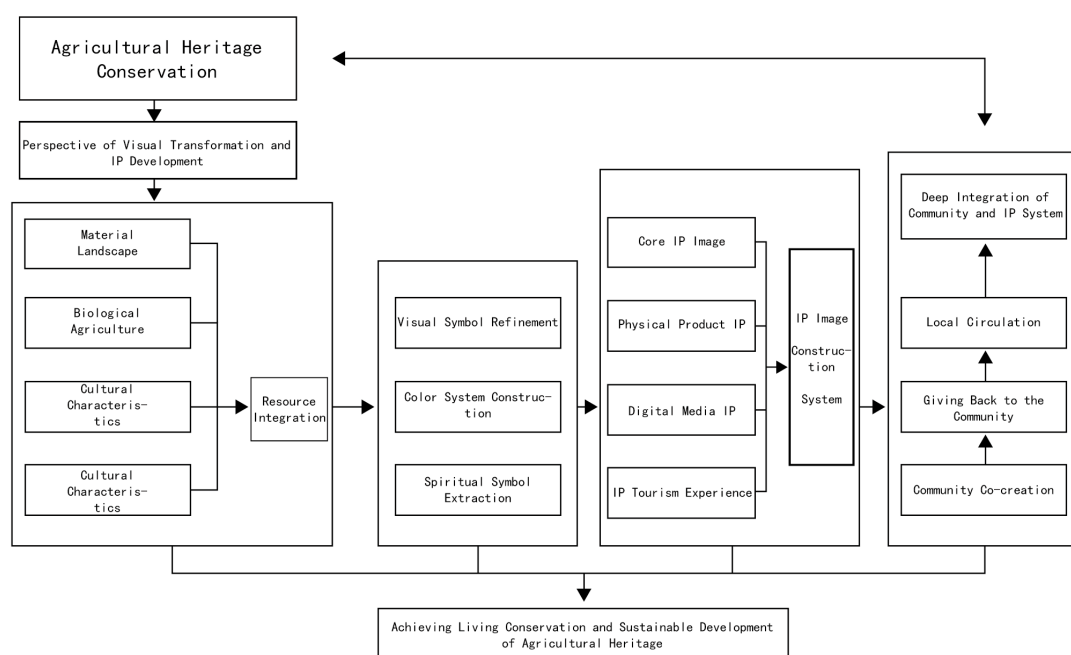


Figure 1. Agricultural Heritage Conservation: The Technical Roadmap of Visual Transformation and IP Development

4. Conclusion and Summary

4.1. Main Research Findings

The four-stage pathway we built in this study gives a systematic answer to the problem of balancing "revitalization" and "sustainable development" in agricultural heritage conservation. The core idea is to encode heritage value through professional design translation that works for modern times, to realize value change and growth through market-driven IP operations, and to make sure that development benefits go back to the heritage and its people through community-embedded mechanisms. This is not just a new method. It is also a deeper practice of the "living conservation" idea, turning protection from something forced from outside into a development need led by the community.

4.2. Contributions and Limitations

What this study adds is that it brings together heritage conservation, design studies, and brand management theory across disciplines, and offers a practical, design-driven conservation framework that adds to and improves on existing approaches. But the limitation is that this pathway still needs long-term testing and adjustment in real heritage sites. Also, the complex issues of who owns the IP and how benefits are shared, as well as possible new environmental pressures from IP development, need more study from legal, governance, and environmental assessment angles.

4.3. Future Prospects

In the future, this pathway can be combined with digital technologies like GIS, VR, and AR to build a digital twin of the Hani Rice Terraces and make immersive digital IP products, expanding conservation and experience. More basically, we need to do more research on IP-based community governance and careful conservation models. For example, while running the IP system, and based on research about the best "forest-village-terrace" structure for keeping terraces healthy[11], some of the returns could be used for headwater forest protection, terrace canal maintenance, and community cultural heritage teams. This would help make sure this pathway leads agricultural heritage toward long-term sustainable development in a scientific, inclusive, and strong way..

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