Indigenous Naxi-Moso cultural values and worldviews for sustainable development: Four Village Biocultural Heritage Coalition, Yunnan, China

Case study for the project ‘Indigenous biocultural heritage for sustainable development’

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More on this case study

This report is one of a set of four case studies from the project 'Indigenous biocultural heritage for sustainable development'. Other case studies in the series include:

Safeguarding Lepcha and Limbu cultural values and worldviews for conservation and sustainable development in the Eastern Himalayas, India

Towards a Biocultural Heritage Territory in Rabai Cultural Landscape: Exploring Mijikenda cultural values and practices for sustainable development

Sumaq Kausay and Ayllu: Quechua values and worldviews for conservation and sustainable development in the Chalakuy Maize Park, Lares, Peru

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Abbreviations and acronyms

BCHT	Biocultural heritage territory
CCAP	Centre for Chinese Agricultural Policy
FSN	Farmers' Seed Network (China)
FPIC	Free, prior and informed consent
NRM	Natural resource management
NGO	Nongovernmental organisation
PPB	Participatory plant breeding
PAR	Participatory action research
RQ	Research question
SDG	Sustainable Development Goal [of the United Nations]
UNEP-IEMP	UN Environment-International Environmental Management Partnership

Executive summary

Biocultural heritage territories (BCHTs) are mosaics of land uses, deeply linked to traditional knowledge systems embedded in cultural traditions. The Potato Park in Cusco, Peru is perhaps the best-known example of a BCHT, where Indigenous knowledge and practices effectively combine food production with sustainable development, biodiversity conservation and ecosystem protection.

This study was conducted as part of the 'Indigenous biocultural heritage for sustainable development' (2018–2021) project, funded by the Sustainable Development Programme of the British Academy. The project explored how Indigenous Peoples' worldviews, wellbeing concepts, cultural values and customary laws promote or hinder biodiversity conservation and sustainable development. This case study focused on four Naxi-Moso mountain communities along the Jinsha river, upstream of the Yangtze river. The area forms part of the three Parallel Rivers of Yunnan Protected Areas area, in Yunnan province, southwest China. It explored the interconnections between culture and biodiversity, and how biocultural heritage contributes to Sustainable Development Goal 2 'End Hunger'. It also explored the feasibility of establishing a community-managed BCHT, and used the Potato Park's decolonising action research approach where research is co-designed and facilitated by Indigenous community researchers. The case study was coordinated by UN Environment-International Environmental Management Partnership (UNEP-IEMP) and China's Farmers' Seed Network (FSN).

It found that the core cultural values and worldviews of the four Naxi-Moso villages — the Stone Village, Wumu, Youmi and Labo Villages — emphasise harmony, balance and respect for nature, and reciprocity and fairness in society. Respect for nature is a core value of the Naxi-Moso 'Dongba' religion that plays a critical role in conserving biodiversity, both domesticated and wild, in resilience to climate change and pandemics, and in ensuring food and nutrition security. In Naxi-Moso culture 'humans and nature are half-brothers'. Like the Andean *Ayllu* concept, the main aspects of the Naxi-Moso worldview are the spiritual world, ecosystems and human communities. Balance between the three is important for wellbeing and adapting to change. Traditional regulations protect forests and water sources, ensure equitable water allocation and promote agrobiodiversity conservation.

The Dongba religion is one of the key reasons for the survival of the four villages' customary water allocation schemes that promote equity and sustainability. These customary water management systems have been critical for coping with recurrent spring droughts in the last decade. Although today the Indigenous governance bodies of the four villages are influenced by the formal administrative system, they have tried to combine this with the Indigenous system in governing their villages, supporting their villagers' livelihoods and maintaining their landscape through biocultural systems. All four villages are continuing to enhance their biocultural systems by establishing and expanding community seed banks, combining agrobiodiversity with agroecology for healthy production and resilient local food systems. Key threats to traditional knowledge and agrobiodiversity include the adoption of high-yielding hybrid varieties, influx of cheap modern foods and significant outmigration.

Although the four villages share the similar Dongba religion, the Moso are descended from a matriarchal society; whereas in the Naxi Stone Village, women are excluded from some rituals. The four villages also have different biophysical and socioeconomic contexts resulting in some difference in ways of governing and maintenance of Indigenous food systems. However, the results suggest that the Potato Park BCHT model can and should be scaled out to the four Naxi villages and other Indigenous communities in China, so long as it is adapted to their distinct geographical and political contexts.

The Indigenous people and social organisations in the four Naxi villages and scientific research partners have coordinated their action research to give rise to the 'Naxi Mountain Community Network in the Jinsha River Basin'. To further promote the protection and sustainable use of traditional ecological culture, the four Naxi Villages will turn their work experience into policy recommendations, form demonstration cases, identify feasible paths for coping with socioeconomic changes and climate change, and share these with their experiences with other communities around the Jinsha River basin and the Himalayas, for coordinated ecological and economic development. A bottom-up, community-led action research approach, with systematic thinking and all components (biological, cultural, livelihoods, governance and so on) interacting and working together, can address multiple challenges facing Indigenous Peoples and biocultural heritage.

1. Introduction and project objectives

Although Indigenous Peoples have been living sustainably for generations, few studies have explored the role of different elements of cultural heritage in nature conservation and sustainable development. This study was conducted as part of the project 'Indigenous biocultural heritage for sustainable development' (2018–2021), funded by the Sustainable Development Programme of the British Academy. The project involved case studies in China, India, Peru and Kenya, and had two main objectives:

- To catalyse the establishment of collectively managed biocultural heritage territories (BCHTs) for sustainable development, and
- To enhance understanding of the role of biocultural heritage in addressing the Sustainable Development Goals (SDGs) among policymakers, researchers and practitioners.

The project explored how Indigenous Peoples' worldviews, wellbeing concepts, cultural values and customary laws promote or hinder sustainable development, and how these are perceived by different actors within communities. Using case studies of the Mijikenda in Kenya, Quechua in Peru, Naxi-Moso in China, and Lepcha and Limbu in India, the project examined how different elements of biological and cultural heritage are interconnected in landscapes, and how this contributes to sustainable development, including achieving Sustainable Development Goal 2 'End Hunger'. Through decolonising action research, the project sought to contribute to community-led processes to establish BCHTs, building on the Quechua Potato Park in Peru.

The case study in China was coordinated by the UN Environment- International Environmental Management Partnership (formerly Centre for Chinese Agricultural Policy (CCAP)), Chinese Academy of Science, and the national Farmers' Seed Network (FSN), working closely with four remote Naxi and Moso communities in Northwest Yunnan province, southwest China.

2. Community context and biocultural heritage

2.1 The landscape and biocultural context

The study focused on four Naxi-Moso communities in the Three Parallel Rivers of Yunnan Protected Areas (upstream of the Yangtze, Mekong, and Salween rivers — see Figure 1 below), in Yunnan province, southwest China. This area is a global biodiversity hotspot well known for its rich biological and ethnic diversity, diversified landscapes and valuable biocultural heritage (Resources and Industries, 2010). It has 118 snow-covered mountains reaching more than 5,000 metres and includes the homelands of 16 Indigenous groups (CCAP and FSN, undated). The Naxi (pronounced 'Nashi'), and related Moso, are one of the main dynamic Indigenous groups living in this area. The Three Parallel Rivers of Yunnan Protected Areas were listed as a UNESCO World Natural Heritage Site in 2003; and the Old Town of Lijiang, the main Naxi cultural centre, was recognised as a UNESCO World Cultural Heritage Site in 1997.

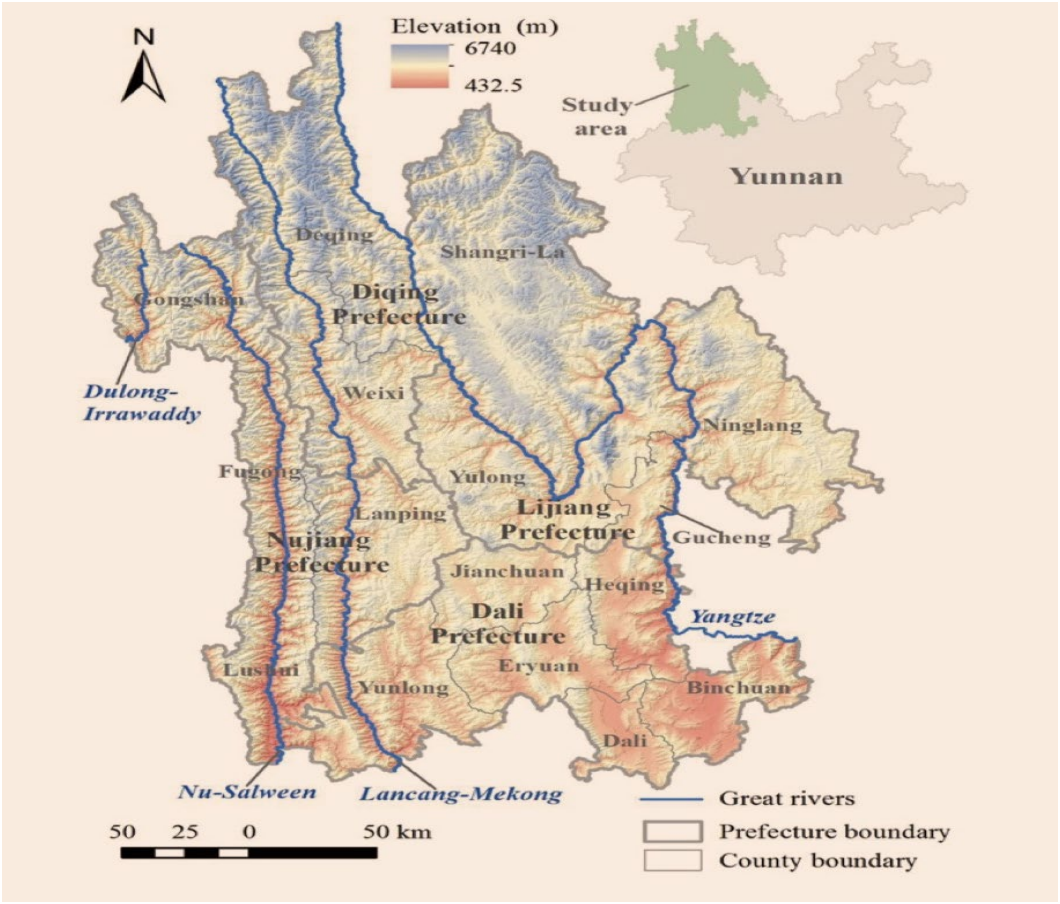


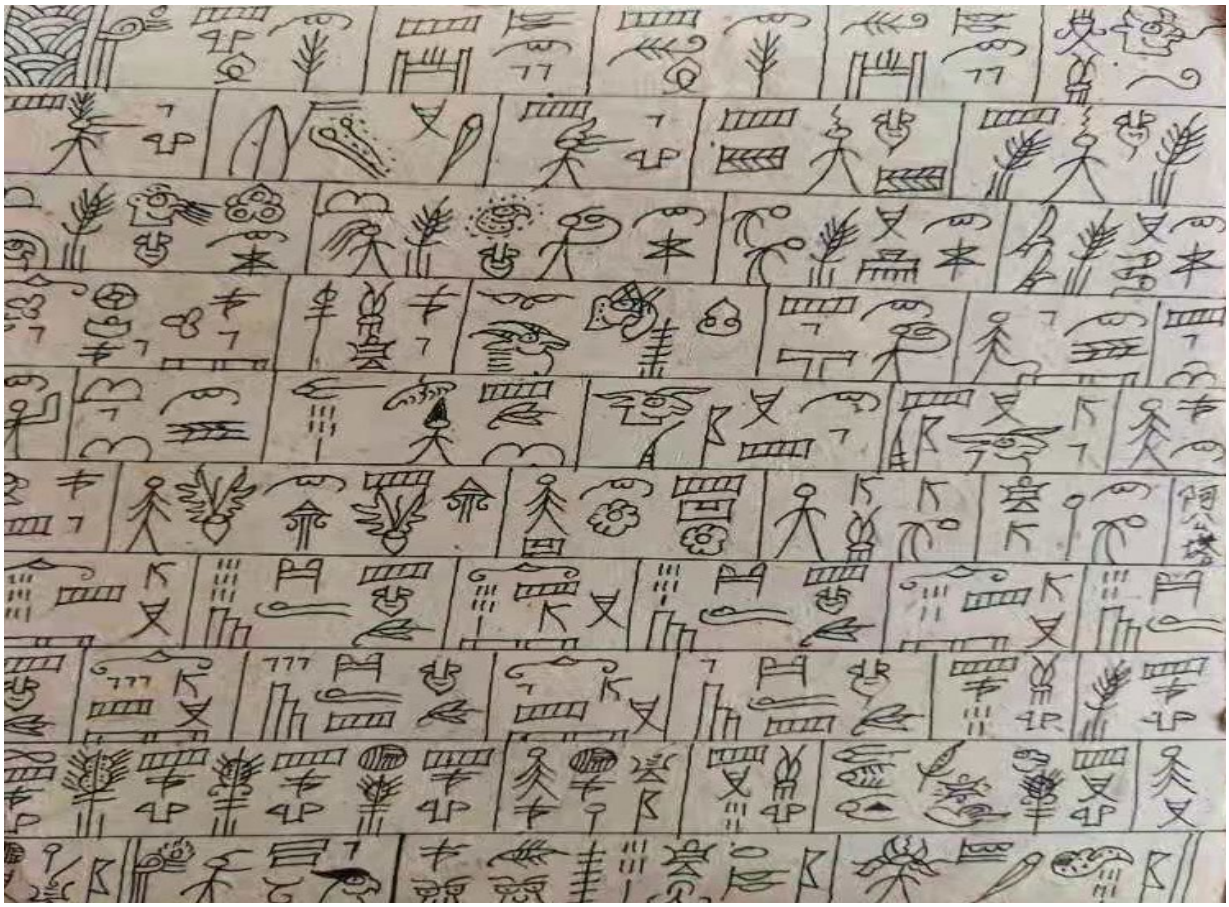
Figure 1: Map showing the Three Parallel Rivers of Yunnan Protected Areas. Image taken from Lin et al. (2016), reproduced under Creative Commons 4.0 International Licence [https://creativecommons.org/licenses/by/4.0/]

For centuries, the 16 Indigenous groups and local communities in the Three Parallel Rivers regions have managed the mountain landscapes sustainably, generation after generation. They do this through traditional and local knowledge systems, conserving biodiversity and ecosystem services to meet food, agriculture, socioeconomic and cultural needs (CCAP and FSN, undated). The traditional and local knowledge system has formed a solid basis for the resilience of the livelihood and socio-ecological system. The Naxi ethnic group and Moso people (a sub-group of the Naxi) are one of the biggest and most innovative Indigenous groups in this region, with more than 1,300 years of settlement and farming history in this mountain area.

Regarding the ethnic origin of the Naxi people, scholars believe that they originated from the ancient Qiang people who lived in the Huanghe area of the Northwest River (Yellow River) of China in ancient times. They migrated south to the upper reaches of the Minjiang River, and then migrated southwest to the Yalong River basin. Then they moved west to the east and west areas of the upper reaches of the Jinsha River/Yangtze River.

The Naxi ethnic group is one of 56 recognised ethnic groups in China and one of the unique ethnic groups in Yunnan. Most Naxi and Moso people live in Lijiang city in north-western Yunnan. The Naxi nationality has its own language, which belongs to the Yi branch of the Tibeto-Burmese group of the Sino-Tibetan language family. The Naxi people have their own religion, the ancient Dongba religion, which is commonly followed by the Naxi people. It belongs to so-called 'primitive polytheism', with ancestor worship, ghost worship, and nature worship as its basic content, and activities such as worshipping heaven, funeral ceremonies, exorcism, and divination as its main manifestations. Since the instructor of the scriptures is called Dongba, it is called Dongbaism.

'Dongba scripture' is the main scripture of the Dongba religion for religious activities. It is written on hand-made earth paper with a bamboo pen, and it is written in 'Dongba script'. These ancient hieroglyphs are condensed into a voluminous Dongba scripture, in which the Naxi people's interpretation of the origin of human beings, mythological stories, and customs of marriages and funerals are recorded. Dongba scripture is not only a religious doctrine, but also contains the Naxi peoples' explorations and thinking about nature and man.



Dongba scripture written by Yang Dongba from Youmi Village. Credit: Farmers' Seed Network (China).

'Dongba', which means 'wise', is also the Naxi word for traditional religious clergy, who are the most senior intellectuals of the Naxi people. Most of them collect songs, dances, scriptures, books, history,

paintings and medicine. The Dongba are the wise people who support their communities in everyday life and the main inheritors of Dongba religion and culture.

2.2 The Four Naxi-Moso Village Coalition, northwest Yunnan

The four Naxi and Naxi-Moso mountain villages (communities) that participated in the project are located along the Jinsha River valley, upstream of the Yangtze River. This is in the heart of the original Naxi (Moso) people's early settlement area, with rich biodiversity, Indigenous Naxi cultures and Dongba religion. The four villages — the Stone Village, Wumu, Youmi and Labo Villages — span an area of about 500km along the river (see map below). These unique Naxi mountain villages share a similar Naxi folk culture and Dongba religion, yet each village has its own features.

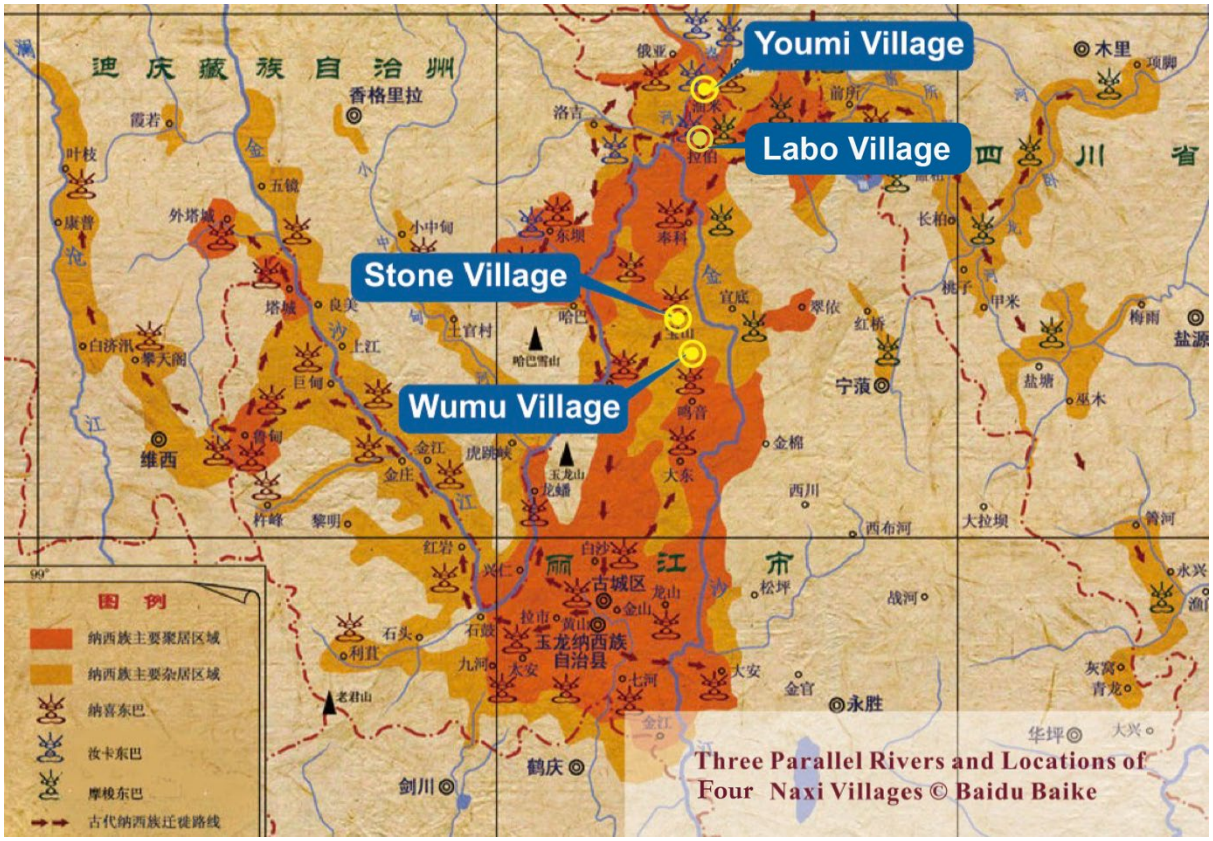


Figure 2: Map showing the locations of the four Naxi villages in the Three Parallel Rivers Protected Areas. Credit: Baidu Baike.

The sustainability of agriculture and livelihoods in the four Naxi mountain villages depends heavily on their terrace farming and irrigation system, diversified landraces and rich biocultural diversity, which play an important role in the livelihoods and spirituality of the villagers (CCAP and FSN, undated). In recent years, traditional farming in the villages has been facing many challenges due to rapid economic development and climatic changes. In particular, local crop varieties and traditional culture and farming knowledge are declining rapidly (CCAP and FSN, undated; Song et al., 2016).

The Farmers' Seed Network (FSN) started working with the Stone Village in 2013. It did this by supporting participatory action research and policy pilot experiments on agrobiodiversity, livelihood security and community-based collective action, following a biocultural heritage approach, and by facilitating links to scientific support and exchanges with other communities. Based on their common Naxi culture, shared interests and common challenges, the four communities organised themselves to

form a network or coalition in 2018. The four villages, although rooted in the same Naxi and Moso culture and Dongba religion, feature different Naxi wisdoms and aspects in their natural resource management and adaptation systems. The Stone Village and Wumu call themselves Naxi people, yet Youmi and Labo identify as Moso people, and they are officially recognised as such. Administratively, the four villages belong to two townships (Baoshan and Labo) and two counties (Yulong and Ninglang) of Lijiang City.

The Stone Village: Located in Baoshan Township, Yulong County, Lijiang City, 126 kilometres from downtown Lijiang and 1,720 metres above sea level, overlooking Yangtze River. There are currently 252 households with about 900 people in the village, and 98% of the residents are Naxi, speak the Naxi language and follow Dongba religion (Song et al., 2016). The total arable land in the Stone Village is 1,026 mu (15 mu = 1 hectare) of terraced mountain land, with less than one mu per capita. The main traditional crops grown in the village are wheat, barley, corn, rice, soybeans, broad beans, pumpkins, cucumbers, sorghum, peanuts, sweet potatoes, different types of vegetables, walnut trees and Sichuan pepper. All the slopes around the Stone Village are reclaimed as terraces. A unique 'open ditch and hidden canal' irrigation system was built as the basis for the Stone Village's terrace construction almost 1,000 years ago. Culverts under each terrace form a kind of watering network consisting of culverts and water outlets. At the end of 2013, a participatory seed selection and breeding team of villagers was established, mainly to carry out the conservation and utilisation of traditional agricultural seeds and the preservation and transmission of Naxi traditional culture. In 2016, the community seed bank was established, seed registration and seed field trials were conducted, women crop breeders such as Zhang Xiuyun and Li Ruizhen emerged, and the villagers established a number of organisations, such as farmers' professional cooperatives, the women's cultural team, and the elders' association.

Wumu Village: Located in the southeast of Baoshan Township, Yulong County, Lijiang City, Yunnan Province, at an altitude of about 2,000 metres, the village has 130 households with about 750 people and used to be a necessary route along the ancient Tea Horse Road. Wumu Village is rich in arable and forest land, but there are not enough water resources for irrigation. Wumu is suitable for and traditionally grows rice, corn, soybeans, sorghum, peanuts, cotton, potatoes, pumpkins, wheat, barley, broad beans, peas and chickpeas. Most of the varieties are landraces and even wild rice and soybean have been found in the surrounding forests. Wumu also has very rich and diverse traditional local plants and herbal resources such as a traditional oil making plant, 'Prinsepia utilis Royle', and medicinal plants including cloud mullein, gentiana and konjac. He Xuejian of Wumu Village is an old, well-known traditional Chinese doctor who is well versed in Naxi arts and herbal knowledge. The village has a Naxi Dongba Cultural Heritage Institute, headed by the Dongba He Jixian. In 2016, Wumu Village became a member of the Naxi Four Village Network/Coalition, and in 2019, He Jixian led the villagers to establish the Wumu Village Seed Library, which collects and preserves more than 120 traditional crop varieties and medicinal plants.

Youmi Village: Located in Labo Township, Ninglang County, Lijiang City, with an average altitude of 2,100 metres, the village has 84 households with a total of 414 people and 638 mu of cultivated land. Its traditional terraced fields are planted mainly with corn, wheat and broad beans. Youmi Village is a traditional village where Moso people live, and there are currently nine Dongba in the village who preside over Dongba ceremonies for villagers. Youmi Village became a member of the Four Village Network in 2016, a cultural team was formed in the village in 2019, and a community seed bank was built in 2020, collecting and preserving more than 30 local varieties. The FSN and the Agricultural Cultural Heritage Team of China Agricultural University have been carrying out cultural history and Dongba oral history research in Youmi Village since 2018, systematically combining traditional ecological and cultural knowledge and Dongba culture.

Labo Village: Located in Labo Township, Ninglang County, Lijiang City, Yunnan Province, with an average elevation of about 1,800 metres, the village has 38 households with a total of 186 people, mainly growing corn, wheat, barley, sorghum and other traditional crops. The Moso Dongba religion (Daba) is also very rich and unique in this village and the villagers' livelihoods depend on the surrounding mountain, river and forests. The construction of a hydroelectric power station dam flooded the fertile farmland along the Yangtze riverbank here, and the villagers moved to the higher parts of the valley. A community seed bank was built in 2019 to preserve more than 50 kinds of local crop varieties, and a Moso cultural team established to promote Moso culture. There are currently 17 Daba priests in

the village, passing on the unique Moso Daba culture through oral transmission and presiding over various ceremonies for the villagers.

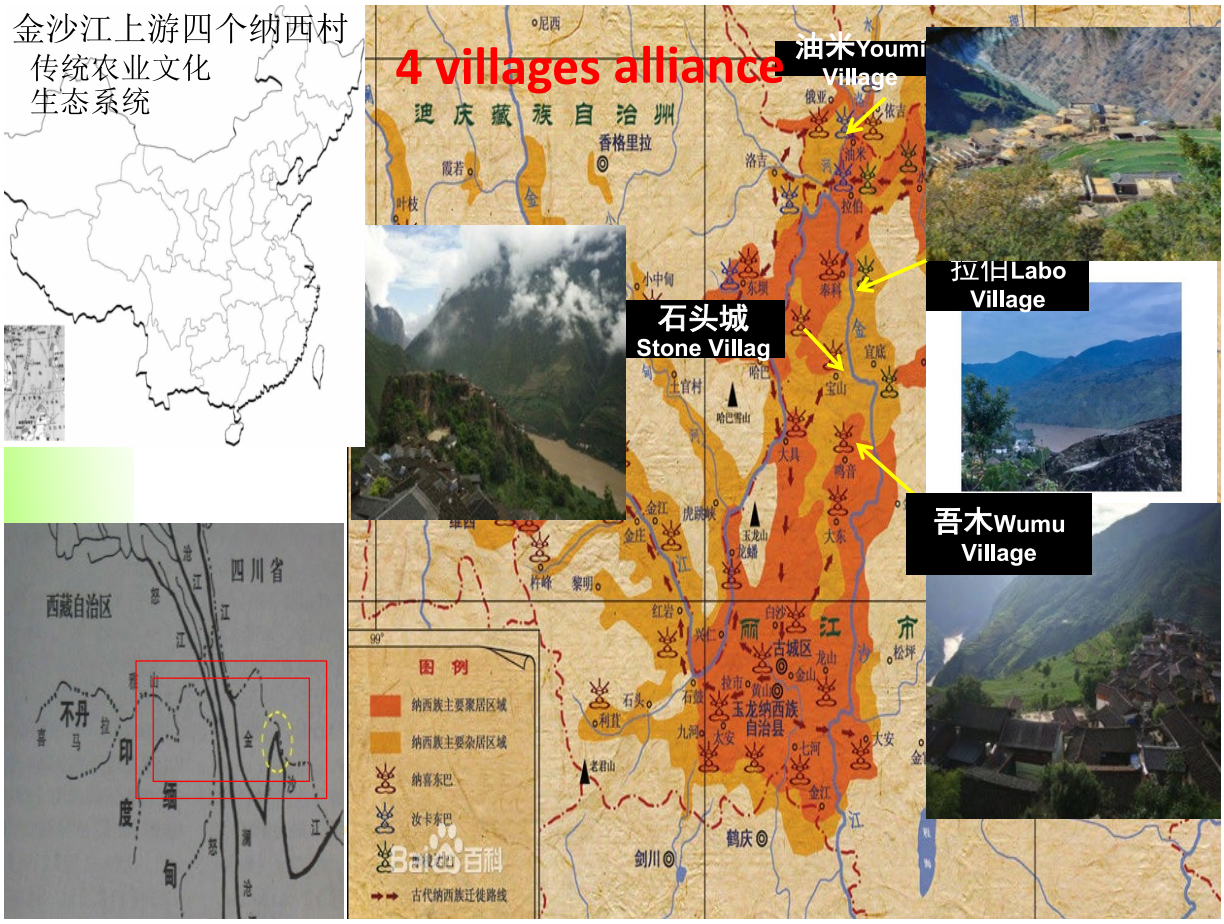


Figure 3: Collage of images showing the four Naxi villages and their locations. Collage created by Farmers' Seed Network (China); photos FSN's own; map images sourced from Baidu Baike.

3. Objectives of the China study: Establishing a biocultural heritage territory (BCHT) network

The study contributed to an existing action research process that aims to protect rich interlinked agrobiodiversity and Naxi cultural heritage for resilient livelihoods, and to establish collectively managed Naxi BCHTs inspired by the Potato Park BCHT in Peru. As a recognised Naxi early settlement centre, the Stone Village was first established as a BCHT following a visit to the Potato Park by the village head in 2013 and a South-South collaboration workshop in the village in partnership with the Potato Park in 2016 (Reilly and Swiderska, 2016). A biocultural heritage territory (BCHT) or park is a new and innovative model for the local villagers. Yet they realised that they need to rely on themselves to protect their homeland and preserve the critical role and interdependence of Indigenous biocultural heritage for livelihoods, conservation and sustainable use of agrobiodiversity.

Table 1 below is a summary of the four villages' main cultural features and existing organisations, meaning the main cultural characteristics and ways of governing in each village.

Table 1: Summary characteristics of the four Naxi villages

	Stone Village	Wumu Village	Youmi Village	Labo Village
Cultural characteristic	• Traditional village • Naxi ethnic group • Used to be Naxi administrative centre 80 years ago	• Traditional village • Naxi ethnic group • One Dongba and a Dongba heritage institute in village	• Traditional village • Moso people • Nine Dongba living in village.	• Moso people • 17 Daba (like Dongba) living in the village
Organisation and governance	• One participatory plant breeding (PPB) group and two community seed banks established • Active leader, management group members and breeders • Women folk dancing group • Elders' association	• One community seed bank established and plant variety selection (PVS) conducted • Training for youth in village • He Jixian is the Dongba and leader, and also the representative for the Lijiang Peoples' Congress in Lijiang	• One community seed bank established and PVS conducted • Dongba group is governing the village • Women's folk group	• One community seed bank established and PVS conducted • Farmer-led women's group

Guided by the framework of sustainable development including social, economic and ecological aspects, the goal or common vision for establishing a BCHT network is to apply multidisciplinary approaches combining natural science and participatory action research to:

- Enhance the capacity of pilot communities and their network to adapt to rapid socioeconomic and climatic changes
- Build sustainable livelihoods and revitalise Naxi biocultural homelands in the watershed of Yangtze River, and

- Explore feasible pathways and policy implications for rural revitalisation and agricultural green development in mountainous communities.

The biocultural heritage of the four villages and the process to establish BCHTs face a number of threats:

- Climate change and extreme weather effects, such as recurring spring drought due to delayed rainy seasons, pests, and diseases affecting agricultural production and villagers' livelihoods.
- Rapid loss of old seeds and traditional farming practices due to the promotion and adoption of high-yielding hybrid varieties, monocropping and industrial agriculture, and labour shortages due to outmigration
- Outmigration of young and middle-aged labourers has caused serious emptying of villages, and therefore weak transmission of traditional biocultural knowledge and diversified farming and livelihoods.
- The trend towards homogenisation of food systems due to reduced crop species and seed diversity has caused community farmers to rely more heavily on external markets for seeds and food, reducing the ability of communities to withstand the impacts of climatic changes and crises like COVID-19.
- Insufficient recognition of, attention to, and use of traditional knowledge of herbal medicine and traditional foods in the face of all these changes. This constrains the interlinking, complementary and mutual reinforcement of traditional medicine, food, biodiversity, and herbal plant conservation and utilisation practices, with modern foods and medicine.
- The disconnection of communities from the outside world and external markets caused by the COVID-19 pandemic in 2020 has hindered opportunities for communities to generate market income. It has also made them rely on traditional food and medicine and support each other within and between communities for livelihoods and adaptation.
- Tourism development provides a key opportunity to generate income linked to biocultural heritage, but also brings more need for household/hotel use of water, which might affect agricultural water use.
- More roads are being built from Lijiang to the four villages to facilitate tourism, which means increased pollution that might affect the fragile ecosystem.
- Dongba religion is one of the key reasons for the survival and adaptation of the four villages' customary water allocation schemes, which have proved vital for coping with climatic changes (CCAP and FSN, undated; Reilly and Swiderska, 2016). But with increasing Han influence, Dongba tradition is slowly fading, along with other customary laws for community-based natural resource management (NRM).

This study sought to contribute to community efforts to address these threats and challenges and to establish a network of BCHTs, by contributing to the following **specific objectives** of the Naxi Four Village Network:

- To strengthen the internal governance system and capacity of the Four Village Network, establishing the Naxi Mountain Community Biocultural Heritage Territory (BCHT) model for effective villager participation and co-management. And to strengthen, demonstrate and publicise the experience of conservation, sustainable use and innovation, and traditional ecological culture of Naxi traditional villages in the watershed upstream of the Yangtze River.
- To cooperate with research institutions in the sustainable conservation and use of farm seeds, herbs, Indigenous ingredients, and traditional ecological culture. And to consolidate the platform for exchange, sharing, and innovation of seeds, food, and traditional ecological cultural knowledge among the network, to enhance their ability to respond to epidemics.

- To support the development of ecological agriculture, based on the combination of seeds and nutrients or agroforestry complex landscape systems; to develop eco-tourism in the Naxi Four Village Network; to cooperate with consumer platforms and social enterprises to enhance the market value of agricultural products, ingredients and herbs; to enhance the level of community diversified livelihoods; and to strengthen climate resilience.

4. Research approach, methods and tools

The project explored the following research questions — each question represents a key component of a BCHT to inform and contribute to the process to establish BCHTs:

1. **Ethnicity:** How are particular ethnic groups connected to the landscape historically?
2. **Worldviews, cultural values, wellbeing:**
    a. How do Indigenous worldviews about wellbeing, cultural values and customary laws promote or hinder sustainable and equitable development?
    b. To what extent are these recognised or applied by different generations and genders, or ethnic, religious, class/caste and economic groups? Which drivers are influencing cultural change (for example, religion, education)?
3. **Governance**: What kind of traditional governance system exists? How can it be strengthened for sustainable management of the local landscape?
4. **Biocultural systems**: What are the main elements of the biocultural system and how are they inter-connected and inter-related?
5. **Livelihoods**: How does the local biocultural system influence the local livelihoods system? How to shape/strengthen a biocultural economy?
6. **Biocultural heritage and SDG 2**: How does the biocultural system contribute to achieving the SDG 2 targets — maintaining genetic diversity, ensuring sustainability and resilience, ending hunger and malnutrition, and doubling productivity?

The above research questions were addressed in all four villages to different degrees, focusing on three main aspects identified by the communities:

- Agrobiodiversity
- Indigenous food systems
- Collective governance.

The key overall research **approach** was an integrated socio-ecological system perspective developed from a biocultural heritage territory and community-based participatory action research (PAR) approach. The Potato Park model and decolonising PAR methodology, developed by Quechua communities and the NGO ANDES (Peru), was shared and discussed in a few workshops with the participation of farmers and researchers for capacity building, co-design and local adaptation. It has been fully understood by local Naxi communities and adapted to the local context, and this was also enabled when a few village leaders visited the Potato Park in 2013 and 2017, and the Potato Park research team visited the Stone Village in 2015. There has been continued exchange among the four villages and the Potato Park since 2013. The research process was co-designed with community leaders and researchers and facilitated by community leaders, using Naxi Indigenous values and concepts, which are quite similar to those of Andean people and other Indigenous communities. Therefore, another key research question was:

- How can the Potato Park model and its ‘decolonising’ methodology be adapted to the local context? What are the key components that are necessary in the local context and what needs to be changed/adapted? What are the local enabling factors and constraints to applying the methodology?

The first step was to conduct a free, prior and informed consent (FPIC) process with the community leaders from each village, to present and discuss the project, and allow them to place conditions (or deny consent). The project team used a range of tools to address the research questions: oral histories, focus groups, semi-structured interviews, participatory natural resource and biodiversity mapping, and

village meetings to analyse and validate the findings. They considered time and space factors in understanding the histories and changes in all four villages. Questions 1, 2 and 3 were addressed more systematically in Youmi and Labo using oral histories of key informants to explore biocultural changes, village history, collective governance and Dongba culture. The process combined tools like semi-structured interviews and biodiversity mapping with ongoing participatory action research activities, including seed registration, participatory variety selection and participatory plant breeding (PPB), particularly in the Stone Village and Wumu Village. The community researchers and leaders in each village played key roles in the process as internal researchers as well as coordinators. The main participants in the villages were respected elders, innovative women farmers and youth. Most households in each village were involved in the process.

Main activities conducted

In November 2019, the project's principal investigator from IIED visited the Stone Village and Labo Village and held meetings and interviews with village leaders, elders, women farmers, a Daba from Labo, and a Dongba from Wumu Village. In January 2020, the research team of eight went to Youmi Village and worked with Youmi community researchers and villagers to conduct a semi-structured community oral history survey and document their Indigenous Dongba culture. The research team used the oral history method to interview nine Dongba priests and document their life history, memories and narratives. It also systematically documented the village history through document and literature reviews in local libraries and semi-structured interviews with key informants. The team explored the village's early history, including their migration route and the settlement of Youmi people from three big families for over 15 generations in the village. They documented the historical changes of the village, and the key milestones related to traditional biological and cultural changes and evolution. They also studied chronicles of the community, and their views on the current situation and challenges facing the communities. The research findings from Youmi will be published in two books in Chinese, *Biocultural History of Youmi Village* and *Oral History of Nine Dongbas* (formally accepted for publication at the end of 2021).

From March to June 2020, the research team visited the Stone Village, Wumu Village, Labo Village and Youmi Village respectively to interview representative farmers, and compile their experiences and perspectives on the COVID-19 crisis. The Farmers' Seed Network (FSN) put together these stories with other community-based adaptation cases in other parts of China into an article in both Chinese and English, which was published online on the UNEP and FSN websites. A story about a Naxi woman farmer from the Stone Village, Zhang Xiuyun, was developed into a short video and shared widely among the FSN. She is a farmer, leader and trainer in her small village and has selected more than 150 maize varieties, some named in her own name; Xiuyuan no 1, no 2, no 3 and so on. She is a very innovative Naxi woman protecting her beautiful, bioculturally rich mountainous community through seed conservation, utilisation, traditional knowledge sharing and PPB.

In October 2020, the research team went to Youmi Village again to supplement and improve the early Dongba oral history and village culture documentation. The Moso cultural history of Youmi Village includes:

- The geographical location and settlement
- The traditional construction of the residential area and evolution until now
- Food culture and characteristics, and changes in mountain plant collection and farming
- The three big families, their kinships and network
- Traditional Moso festivals
- Skilled craftsmen in the village, and
- Different types of Dongba rituals throughout the life of the Youmi people and in different farming seasons.

Audio and video recordings partly documented this cultural history.

In November 2020, the FSN and the Naxi Mountain Community Network held a workshop called ‘Seeds, Traditional Ingredients and Sustainable Development of Naxi Mountain Villages’ at the Farmer Seed Library of Wumu Village. This event included participants from the Stone Village and more than 20 village representatives from the local participatory teams in Lijiang city, Labo Village and Wumu Village. The workshop strengthened the connections between the four villages, and promoted the exchange of seeds and traditional cultural wisdom between them.

From December 20–23 2020, the FSN Report on ‘Seeds: Global Challenges and China's Reality’ was formally launched as a pre-activity for the Biodiversity Convention COP 15 and as part of an FSN photography exhibition, *Traditional Farming Culture and Seed*, in Beijing. With the theme of ‘Sowing Diversity, Harvesting Security’, this event included a series of activities such as photography exhibitions, report releases, lectures and salons. It launched online live broadcasts through video exhibitions, conferences, discussions and public participation to demonstrate China's successful experience in the field of biodiversity conservation and utilisation. The research team actively coordinated and supported a total of nine representatives from the four Naxi villages to participate and share their traditional culture and seeds in Beijing.

In January 2021, the FSN joined hands with the Naxi Mountain Community Network (the four villages) to hold a barefoot workshop called ‘Indigenous Food Systems, Ecological Cultural Heritage and Agricultural Resilience’ in the Stone Village. Participants included representatives of the Stone Village, Wumu and Labo villages, community leaders, researchers, and senior community elders, including more than 30 elderly, women, and young people. Representatives of the three villages and the research team explored the strengths and disadvantages of the four villages, the existing problems they face and their causes, and the coping strategies used by the village as a unit. Representatives of the Stone Village, Wumu Village and Labo Village presented their agricultural system type, Naxi traditional ecological cultural heritage, and traditional farming culture and food. This included the local and modern varieties and wild relatives of major crops; the importance of traditional crops, human nutrition and land health; ecological resilience; the sustainability of traditional Naxi culture; major trends and changes in recent years; and the impact of climate change.

5. Results

The results and findings of the research questions (RQs) explored are summarised below.

Ethnicity: historical connection to the landscape (RQ 1)

This research question was addressed through literature review, interviews, group discussions and oral histories in the four villages separately and jointly (including through inter-village meetings and exchanges). The most systematic study was conducted in Youmi Village, where the whole FSN team visited five times during the past two years. This question was also partially explored in the other three villages using the same framework and tools.

The main finding is that the Naxi and Moso groups originally migrated towards the Yangtze riverbanks more than 1,000 years ago, from Nepal or Tibet respectively. The Naxi were herders and gradually settled down, living on wild food collection and farming. Comparatively the livelihood and spiritual beliefs of the two Moso villages (Youmi and Labo) are more connected to the landscape and nature than the two Naxi villages (Stone and Wumu), which are closer to cities and have experienced more impact from industrialisation.

Worldviews, cultural values, wellbeing and sustainable development (RQ 2)

Dongba religion is based on the relationship between nature and man, and respect for nature. The basic concept of Naxi beliefs is that people should live in harmony with nature. In Dongba mythology, 'Nature' and 'Man' are half-brothers, having different mothers. Naxi and Moso peoples' worldviews and cultural values are closely connected to nature, as per their sayings "Our culture is grown up from the landscape", "Our livelihood is closely connected and depending on nature". They respect every living being and believe that every living being has a spirit. They interact with nature and share elements of nature within and between communities through customary laws. Their attitude towards nature is clearly illustrated by the story of He Shun, a Dongba priest who forbade his three sons to cut down more trees than they personally needed, as this would anger the gods and bring misfortune to his family.

Harmonious relations between nature and people, and opposing the wanton destruction of nature are core Naxi-Moso values. Traditional core values and beliefs, such as balance and harmony, sharing and reciprocity — with nature and in society — are important for ensuring biodiversity conservation and the continuity of community adaptation and innovation processes (Song et al., 2016). For Naxi people, Dongba religion is their worldview and spiritual connection to nature (for example, forests, water sources, mountains), and provides values that guide people's interaction with nature and with other communities. The main aspects are: the spiritual world, wild ecosystems and human communities — balance between these three elements is important for continuity and adapting to change. Reciprocity helps to achieve balance — as the Donga from Wumu (He Jixian) explained, "If people borrow resources from nature and don't give back, then nature will have a disaster — so the Dongba has to coordinate the conflicts/relationship to promote harmony between people and nature."

These three key elements can be seen in a painting representing Naxi cultural values in the form of a mountain. As He Jixian explained, "Each part has its own soul — the top part is sacred so people can't go there, as mountain tops are spiritual. The middle part is the wild part which also has souls — it is full of wild animals, rivers, trees' souls/ghosts; and the lower part has human souls/ghosts because people are buried in farmland." These three elements mirror those of the Andean *Ayllu* concept of wellbeing, which requires balance between the sacred, wild and human worlds.

Respect for nature has promoted Naxi-Moso community adaptation and sustainable development in general, but has also hindered their market links, because for them, many natural resources like seeds, crops, even trees were not originally commodities, but rather gifts for sharing. In addition, Dongba culture has not promoted gender equality. As a member of the women's farmer group in Stone Village explained, "Dongba are only men, and women are not allowed to participate in most of the rituals," and

“If we change this the gods and ancestors will be angry.” Moso is traditionally a matriarchal society, but has been influenced by Chinese and Tibetan culture, and so is no longer matriarchal (except for those living around Moso lake). As a woman farmer in Labo explained, “Women can do all the rituals themselves but can’t be a Daba. Women host rituals at home three times a day — morning, noon and evening, for the ancestors.”

It is interesting and significant to note that the four villages share similar worldviews, cultural values and wellbeing concepts, even though the Naxi and Moso speak different languages. However, the four villages are at different stages in evolution or development due to different geographic locations and historic development in each village. So Naxi-Moso biocultural heritage is adapting to change and evolving. Youmi, the most remote village, is the most conservative and traditional, while the Stone Village is the most ‘developed’ (or least traditional) of the four villages (with no Dongba for the past few years). Naxi values are becoming weaker among the youth and young men in particular, due to outmigration from the villages for education and work (Song, 2016). The Stone Village and Wumu are closer to Lijiang city so people can migrate more easily than from Youmi.

Naxi cultural erosion started several decades ago driven by political and education systems. As explained by He Jixian (Dongba from Wumu):

“Dongba culture was forbidden in 1949. It is necessary for the Stone Village to restore a Dongba but it is difficult to restore beliefs and faith in the Stone Village because the cultural atmosphere has disappeared. Previously the whole village lived a spiritual life. And it is difficult because kids migrate, and oral history and stories disappear. And with modern education people believe in science. Education can also restore culture. After 1949, the Communist Party built a lot of schools which taught Han culture, not our own culture, and ethnic people were encouraged to integrate to modern life. Parents in rural areas want to educate kids so they can leave the village, so the kids have no connection to nature. But often they go back to the village as they can’t afford to stay in the city and some young people want to learn traditional culture, but have no roots in country life. So that is a big challenge.

“In modern science they emphasise innovation but that creates social and ecological problems so traditional culture has solutions — going back to it is a kind of innovation. The key point of going back to traditional culture is to live in harmony with nature.”

The traditional governance system and how can it be strengthened (RQ 3)

The traditional governance system of the Naxi-Moso villages is quite typical for Naxi people and is connected to religion, landscape and kinship. In Youmi, nine Dongba are the governing body of the whole village through three big families’ kinship ties, which have connected 86 households for more than 15 generations since they settled in Youmi. The other three villages have more or less the same Dongba religion and customary laws, which are still functioning, for example in water management, biodiversity and forest conservation, labour sharing and so on. The customary water management systems in the Stone Village and Wumu Village ensure water availability and equitable allocation of water among households, and have proved vital for coping with recurring spring droughts in the last decade.

Under Dongba religion, the villages have traditional regulations for logging, and only one person from each household is permitted to do this job, in order to promote sustainability and enforce fairness between households with more or fewer labourers. As Mr He, an elder from the Stone Village explained: “There is a special area in the mountain where you can’t log — must conserve that special area of forest. We have a guardian to guard that forest, assigned to protect it.” The Moso Daba religion is very similar, as a Daba from Labo explained: “We have the god of trees and water sources; the Dabas tell farmers to protect water sources and the god of trees — they believe that if people destroy water sources or trees they will get disease and they need to invite a Daba to do a ritual to cure it.”

Although today the Indigenous governance bodies of the four villages are more or less influenced by the formal administrative system, they have tried to combine both the Indigenous and administrative systems in governing their villages, supporting their villagers’ livelihoods and maintaining their landscape through biocultural systems. He Jixian explained: “In Wumu Village, customary laws are still

working but they have farming challenges, for example, the local government is promoting tobacco plantations to reduce poverty, so that is encouraging logging."

Dongba Zhashi Yang in a worship ceremony from Youmi village. Credit: Farmers' Seed Network (China)

Biocultural systems: main elements and their interconnections (RQ 4)

The main elements of the biocultural system for Naxi-Moso people in the four villages are the spiritual world, biocultural environment/surroundings and people. For them, nature is brother, and everything has a spirit. So they worship mountain and land gods, water gods, forest gods and even seed gods, and have sacred forest, sacred water places, sacred seeds and so on. They perform many different rituals in different farming seasons during the year, for example, thanksgiving ceremonies for worshipping nature and ancestors during the harvest to pray for a good harvest, providing offerings of fruits, nuts, foxtail millet, rice and wheat, and sacrificing a cockerel. Through rituals and dances, the Dongbas educate children and young people to conserve natural resources; they are an educator for nature.

In Wumu, they have a holy tree and the water source is holy — logging is forbidden around the water source; they use sticky rice and waxy maize for rituals. As explained by He Jixian (Dongba, Wumu), "in Tibetan culture, each mountain has a mountain god and name. In Naxi culture we only have a few mountain gods". In Naxi culture, they believe that the 'owner' of the water source is a lady/female. As the Daba in Labo explained, "We have a traditional festival to walk around the mountain in August.

Some mountains have a name in our Moso culture. Our traditional iconography includes several animals — in our culture we have a strong connection with those animals."

Today Naxi rituals are still performed but to a lesser extent, particularly in the Stone Village since it does not have a Dongba. However, the Stone Village elders call on the services of the Dongba in Wumu Village for important rituals and ceremonies (for example funerals), and two youths in the Stone Village are learning Dongba scripture. As Mr He, an elder from the Stone Village explained, rituals are still performed without Dongbas and are being revived. He said: "Different families have their own rituals in different places in open fields. In the 1950s, 60s and 70s, rituals were forbidden, but after the Cultural Revolution in the 1980s Mr He and the Elders' Association recovered the rituals and still do them — the main activity of the Elders' Association is to organise the rituals.

"In the past we had a festival each month and each season — Naxi people have their own agricultural seasons. When we harvested rice we put it in the shape of a mountain and asked Dongba to do ritual to ask for good harvest etc. We are not doing it now because we no longer grow rice." Rice cultivation has greatly reduced in the Stone Village partly due to reduced rainfall in the last decade (Song et al., 2016).

Landscape of Youmi village in the upper Yangtze River. Credit: Farmers' Seed Network (China)

The Five-Buddhist Crown with symbols of gods is of great significance for Dongba religion in Naxi-Moso culture. Credit: Farmers' Seed Network (China)

Biocultural heritage, SDG 2 and COVID-19 (RQ 6)

The study found that Naxi traditional concepts and values play an important role in maintaining agroecosystems and agricultural biodiversity to promote food and nutrition security. However, agriculture and food systems are increasingly influenced by modernisation. Although there is no hunger in the four villages now, they have realised that monocropping and external chemical inputs like pesticides, herbicides and fertilisers have damaged their land and polluted their water. Furthermore, external artificial unhealthy foods have resulted in increased malnutrition, heart disease and high blood pressure in all four villages. The current food production and consumption of many households is not sustainable or healthy. The four villages therefore decided to continue enhancing their biocultural system by establishing and expanding community seed banks in all four villages, conducting seed and knowledge exchanges within and among communities, and working with scientists to explore nutritious and resilient forgotten plants and abandoned traditional knowledge in the Indigenous food system. All four villages have started to combine agrobiodiversity with agroecology for heathy production and local food systems in the last few years.

These approaches and practices have proved crucial for safeguarding the four villages' livelihoods, food security and sustainability during the outbreak of COVID-19 in the spring of 2020. The COVID-19 crisis has shown that Indigenous communities and their biocultural systems are essential for supporting local people in times of crisis and in adapting to all types of changes, as they are linked to their landscapes and heritages and work closely with nature. For Naxi people, the future of people and nature are intertwined and they believe that "we have to take good care of nature, who is our brother". The stories of the four villages during COVID-19 really shows how working with nature can help people cope better with and recover from crises like these and increasing climate change impacts. In the Spring of 2020, when the COVID-19 outbreak occurred in China, the main transport links and markets were closed and the four remote Naxi villages were also in lockdown. However, with their own governance systems and community seed banks, they managed to do the spring sowing and continue cultivation.

As the photos below show, during the pandemic, farmers in the Stone Village were busy sowing and cultivating a variety of landraces of grain crops and vegetables on terraced farms. Farming work kept villagers busy and provided nutritious and affordable food locally during the pandemic. In Youmi Village,

farmers were busy planting their self-selected landraces and varieties from their own community seed bank, including maize, pumpkin, cucumber, celery, cabbage, lettuce, chili, eggplants and so on.

Naxi-Moso women selecting maize seeds in the spring of 2020, Youmi Village Credit: Shichun Yang.

The beautiful Stone Village and its terrace fields during the COVID-19 pandemic. Credit: Haimei Liang

6. Analysis of the findings

This study has shown that the Dongba religion is one of the key reasons for the survival and adaptation of the four villages' customary water allocation schemes that promote equity and sustainability. But with increasing Han influence, this tradition is slowly fading along with other customary laws for community-based natural resource management (NRM), to different degrees in the four villages.

Although the four villages share the same Dongba religion with similar spiritual beliefs, the adaptation strategies in each village's specific landscape and bio-physical and socioeconomic contexts are different. This has resulted in some differences in ways of governing, adaptation and coping strategies, and maintenance of Indigenous food systems. For example, Youmi's Indigenous food system and biocultural heritage are more complete and comprehensive than those of the Stone Village. The latter is more impacted by modernisation. The same is true of the two villages' governing body, family kinship and community organisations. At the same time, the Stone Village, which is closer to Lijiang city and market is also economically better off and has more experience with market access, but has weaker Dongba culture. These differences are the main reasons why the four villages want to work together, to learn and exchange from each other in NRM, cultural and economic activities.

The revitalisation of Dongba religion and language is already taking place to ensure its inheritance in all four villages, with support from FSN and CCAP and with leadership from the communities:

1. Teaching Dongba language and symbols
2. Establishing community seed banks and Dongba culture museums
3. Enforcing traditional practices, for example, empowering elders to watch over all tasks and respect nature, despite outside influence.

The four villages have some collective actions and individual village activities based on each village's needs and interests. In the Stone Village, farmers have connected their traditional mountain farming knowledge system to the scientific knowledge system in seed selection, biodiversity conservation and utilisation for biocultural and ecosystem-based adaptation. In Wumu Village, the ancient terrace rice farming with irrigation system has formed a resilient 'sponge' farming system, which is highly adaptable to climate change as it helps to withstand drought (FSN and CCAP, undated). In Youmi Village, the Dongba culture and beliefs anchor the hearts of Youmians and play a central role in supporting everyday life and governing community spiritually. Labo is the fourth village joining in the network, located near the riverbank between the Stone Village and Youmi Village, learning and sharing its rich biocultural knowledge and experiences, including a Daba museum, with the other three villages. The different villages' expertise and strengths complement and support one another through the network.

The study's participatory research process strengthened the capacity of the communities to protect their biocultural heritage. For example, in Youmi, villagers have a better understanding of their traditional biological and cultural heritage and have generated new ideas to dynamically protect their homelands in a collective manner.

The results suggest that the Potato Park biocultural territory model can and should be scaled out to the four Naxi Villages and other Indigenous communities in China to protect biocultural heritage and promote sustainable development. However, the model will need to be adapted to the distinct geographical context, with the four communities being dispersed and spanning an area of about 500 kilometres — despite this the communities are discussing establishing some shared principles and institutionalised practices for collective governance and mutual learning and support. The Peruvian model also needs to be adapted to China's more centralised governance system which makes autonomy, self-determination and territorial control more challenging. The local enabling factors for sustainable development in China are the government-supported rapid socioeconomic development and changes, which improve communities' general economic situation, mainly from non-farming income, and provide an easier connection to the outside world and markets via road and internet. At the same time, such development also represents constraints and threats to biodiversity, traditional knowledge and BCHTs as a whole.

7. Conclusions and recommendations

This study has shown that the core cultural values and worldviews of the four Naxi-Moso villages emphasise harmony, balance and respect for nature, and reciprocity and fairness in society. Respect for nature is a core Naxi-Moso religious value that plays a critical role in conserving biodiversity, both domesticated and wild, in resilience to climate change and pandemics, and to ensure food security and nutrition. The Naxi worldview is similar to the Inca worldview and Andean concepts of *Sumaq Kausay* and *Ayllu* (holistic wellbeing), which require balance between the sacred, the wild and the human realms. This can be seen from comparison of an ancient Naxi graphic and an ancient Inca graphic (Figure 4). Although the Moso are descended from a matriarchal society, the Naxi Dongba religion does not promote gender equity — women cannot be Dongbas or attend most rituals.

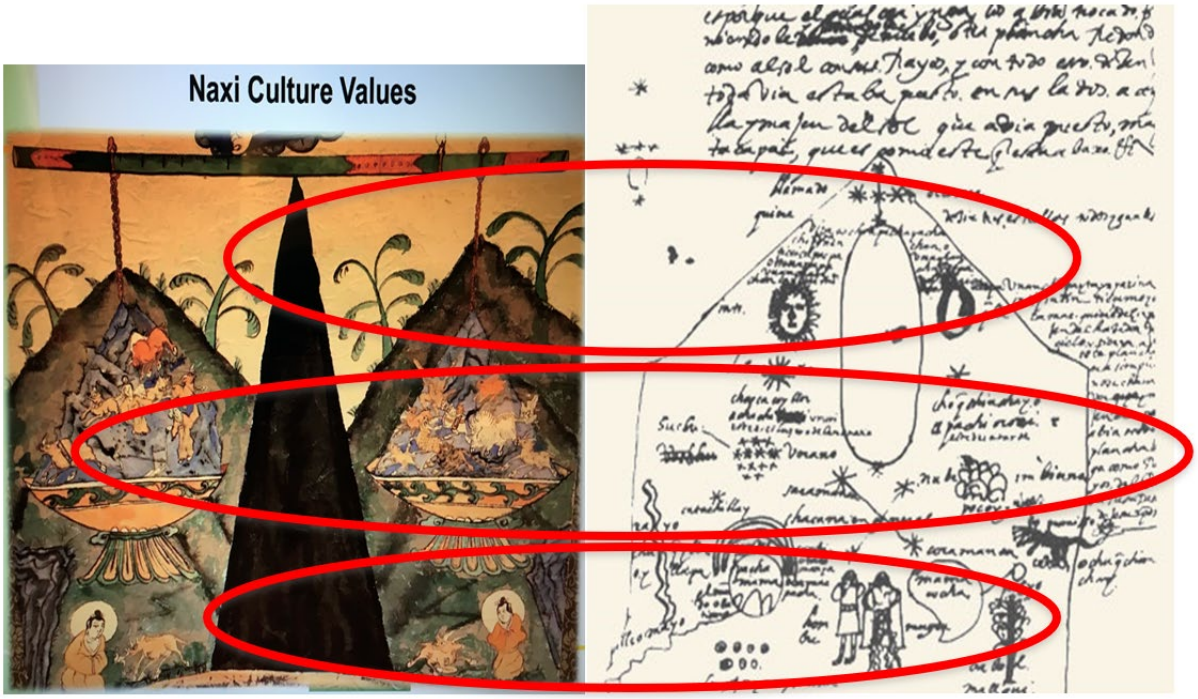


Figure 4: Painting and graphic representing the Naxi and Inca worldviews. Santa Cruz Pachakuti drawn by native chronicle in 1613, depicting the sacred, wild and human realms. Sources: Pereira (2006); Alejandro Argumedo presentation in Lijiang in 2016.

Since 2013, the network of four Naxi villages in the Jinsha River Basin has started from the Stone Village and gradually expanded to three other traditional Naxi villages in the same basin. Starting from a focus on seed conservation and utilisation, it has gradually expanded to include the protection and sustainability of agricultural biodiversity; the utilisation, protection and inheritance of traditional ecological and cultural knowledge; and the holistic development of communities. In this process, community-level actions and results have been continuously enriched. In this regard, we summarise our conclusions and recommendations from this process and the current study together, for researchers and policymakers:

- The mountain farming system in the Jinsha River Basin is the crystallisation of the practice and wisdom of the Naxi and Moso people in the sustainable use of natural resources to cope with climatic and social changes. It is an excellent example of sustainable and balanced diversified development of the environment and livelihoods.
- Starting from the protection and utilisation of agricultural biodiversity and farm seeds, gradually establishing a holistic perspective that includes the protection of related traditional ecological culture and the comprehensive development of the community has helped to strengthen the villagers'

cultural self-confidence and awareness of collective action. This is conducive to the protection of biodiversity and the development of sustainable livelihoods to cope with climate change.

- Combining traditional knowledge relating to biodiversity with modern science and technology, through approaches such as PPB, farmers and scientists work together to understand, recognise and cooperate with each other, to play mutually complementary roles, strengthen biodiversity conservation and sustainable use, and lay the foundation for scientific and sustainable development.
- The protection and utilisation of agricultural biodiversity, traditional knowledge, and fair benefit sharing can promote cooperation and innovation among farmers, scientists and enterprises, and further encourage the protection and sustainable use of biodiversity. This needs to gain greater support and recognition at the legal and policy level.

The villagers, scientific research institutions and social organisations in the four Naxi villages in the upper reaches of the Jinsha River of the 'Three Parallel Rivers' protected area have coordinated their action research to give rise to the 'Naxi Mountain Community Network in the Jinsha River Basin'. Notable results have been achieved in the intergenerational transmission of traditional knowledge and the comprehensive development of the community, which have been recognised and supported by the Chinese Academy of Sciences and the local government. In order to further promote the protection and sustainable use of traditional ecological culture, the four Naxi Villages will turn their work experience into policy recommendations, form demonstration cases, identify feasible paths for coping with socioeconomic changes and climate change, and share these with communities around the Himalayas and the Jinsha River basin, for coordinated ecological and economic development.

A bottom-up community-led action research approach, with systematic thinking and all components (biological, cultural, livelihoods, governance and so on) interacting and working together, can address multiple challenges facing Indigenous Peoples and biocultural heritage. Such an approach is important to achieve the Sustainable Development Goals including SDG 2 'End Hunger' and SDG 15 on biodiversity conservation. Community leadership and learning from the knowledge and expertise of farmers is important for success, local ownership and sustainable impact. A community-based biocultural approach can also strengthen capacity to adapt to environmental and social dynamics.

The collective memories of all four villages has been crucial for 'waking up' self-confidence for cultural revitalisation and collective action in order to address common challenges in sustainable development. The villagers and storytellers wish to bring everyone enlightenment and hope through sharing their warm memories and positive experiences so they can work together with others towards a future of nature and humans in harmony.

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