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Bird Photography Tourism, Sustainable Livelihoods, and Biodiversity Conservation: A Case Study from China

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Determining how mountain communities in conservation priority areas can benefit from rich local biodiversity through sustainable development has been a challenge to governments throughout the world. The village of Hanlong in western Yunnan, China, has been

developing bird photography tourism to capitalize on the extremely rich avifaunal diversity of the area. In this study, we analyzed the impact of the emerging tourism on local communities' livelihoods and identified the key areas of improvements for wider dissemination of the experiences. Bird photography tourism in Hanlong has contributed significantly to the sustainable livelihoods of local communities by providing a major new source of income, creating local employment opportunities, and reducing local people's dependence on the extractive use of forest resources. In the process, local communities have acquired new knowledge, skills, and social networks. They have also developed new

institutions and governance mechanisms, which enable them to better adapt to the changing socioeconomic environment. Bird photography tourism offers new opportunities and hope for sustaining local livelihoods and biodiversity in conservation priority areas. Experiences in Hanlong offer an excellent heuristic example for sustainable community development, adaptation, and transformational change in conservation priority areas. They also contribute to the realization of the Sustainable Development Goals and Aichi targets and thus have value for wider upscaling. Geographical location, local leadership, and external support are all important for the success of bird photography in Hanlong. We recommend that a landscape (including transboundary landscape) approach be adopted to integrate farming practices, other economic activities, and photography tourism. Farming practices and land uses that sustain bird diversity should be encouraged.

Keywords: biodiversity; bird photography tourism; ecotourism; innovative livelihoods; sustainable development; Gaoligongshan; Far Eastern Himalayas.

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Introduction

Biodiversity is essential for sustainable development and human wellbeing (Naeem et al 2016; IPBES 2019). Sustainability implies maintaining the capacity of ecological systems to support social and economic systems (Berkes et al 2003). The Convention on Biological Diversity (CBD 1992) acknowledges that “conservation and sustainable use of biological diversity is [are] of critical importance for meeting the food, health and other needs of the growing world population” and recognizes the benefits derived from biodiversity and ecosystem services (Forest Peoples Programme 2016). In addition, the Sustainable Development Goals (SDGs) adopted by the United Nations (2015) clearly emphasize the need to protect, conserve, restore, and

sustainably use ecosystems and their services to achieve sustainable development (Goal 15) and end poverty in all its forms (Goal 1).

However, biologically rich areas are often impoverished (IUCN 1991; Fisher and Christopher 2007). For instance, more than half of China's 14 most impoverished areas are located in biodiversity-rich areas, such as western Yunnan, the Qingling-Bashan mountains, and the Tibetan region (Tian et al 2018). Regionally, the Far Eastern Himalayan landscape (ICIMOD 2015), stretching from northeast India and northern Myanmar to western Yunnan in China, presents another typical case. Three global biodiversity hotspots converge in this region (CEPF 2011). It is extremely rich in biodiversity, with at least 7 protected areas (PAs), including the Gaoligongshan National Nature Reserve

(GNNR) of China; the Namdapha Tiger Reserve and National Park of India; and the Hukaung Valley Wildlife Sanctuary, the Hkakabo Razi National Park, and the Bumhpabum Wildlife Sanctuary of Myanmar. Over 250,000 people from more than 20 indigenous ethnic groups, such as Lisu, Singpho, and Rawang (Basnet et al 2019), live either within or adjacent to these PAs. They are among the poorest and most underdeveloped communities in all 3 countries (Hunzai et al 2011; Tian et al 2018). They depend heavily on the natural resources of the landscape for their livelihoods. The designation of PAs has limited their traditional resource use rights and practices, resulting in underdevelopment and park–people conflicts (Xiong and Zhu 2006; He et al 2020). Moreover, emerging drivers of change, such as climate change, urbanization, market competition, and globalization, have exerted additional pressures on the communities. National and local governments in China, India, and Myanmar have struggled to achieve the equally important goals of protecting globally important biological and cultural diversities and sustaining economic development of local communities, in particular, through more sustainable use of the rich local biological resources (Xu et al 2018). In China, rural tourism development has long been promoted as a means of poverty alleviation, as well as socioeconomic transformation in poor rural areas (Gao et al 2009; Feng et al 2018). In particular, the economically poor but biologically rich mountain communities are supported to develop innovative thematic nature tourism (eg wildlife-based tourism) to capture the fast-growing market demand of the more affluent Chinese for experiences in nature (Li et al 2017; Feng et al 2018).

Hanlong, a mountain village at the periphery of GNNR, with the support of local government and nongovernmental organizations, has been developing bird photography tourism to capitalize on the extremely rich avifaunal diversity of the local area and booming domestic tourism in China. Over a span of 5 years, through local innovations and external support, bird photography tourism in the village has reached a considerable scale with wide participation and strong self-governing mechanisms. The experiment and experiences of the village have attracted wide attention and interest in China due to their significant role in poverty alleviation and as a model for green rural development and ecological civilization (Gao et al 2019).

To improve local practices and promote regional learning, the International Centre for Integrated Mountain Development (ICIMOD) conducted a case study on the bird photography tourism practices in Hanlong in 2017–2018. The objectives of the study were: (1) to assess the economic contribution, biodiversity, and environmental conservation, social inclusiveness, and self-governance dimensions of local bird photography tourism; and (2) to identify areas for improvement and entry points for interventions.

For comparison, Baihualing, a village immediately next to Hanlong but less involved in bird-watching tourism, was also covered in the same study.

This article reports some of the research findings. Using the concepts from the Sustainable Livelihoods Framework (Levine 2014), this article analyzes the impact of emerging bird photography tourism on the community's household income, social wellbeing, adaptability, and sustainable use of natural resources. It also discusses the key lessons learned, wider replicability, and areas for improvement.

Study area and methodology

GNNR, Hanlong, and Baihualing

The GNNR is a national PA established in 1986 on the China–Myanmar border area to protect the vertical spectra of vegetative types, ecological zones, and associated fauna and flora. The PA and its surroundings are particularly rich in plant and bird species (Chan et al 2019) and have attracted botanists and zoologists, including ornithologists, from both China and abroad since the 19th century (Lyte 1989: 5–9). ICIMOD facilitates transboundary collaboration among China, India, and Myanmar through a Landscape Initiative for Far Eastern Himalayas (ICIMOD 2015). The GNNR and its adjacent area represent the key working area of the initiative (Figure 1).

Hanlong and Baihualing are villages situated next to each other at the southeastern periphery of the GNNR, belonging administratively to Lujiang township of Longyang District, Baoshan City, Yunnan Province, China. Hanlong (25°17'46"N; 98°48'11"E; elevation: 1524 masl) is located at the entrance to the GNNR. It is about 30 km to Lujiang town and nearly 630 km to the provincial capital of Kunming, and it is conveniently connected to the motorway. In 2017, there were 50 households and 220 people in Hanlong; around 44% of the households had a family size of 3–4 members, and 42% had 5–6 members. The village has a subtropical climate with an average annual rainfall of 1000–1400 mm (Fu et al 2012) and is suitable for a wide variety of crops. Traditionally, farmers grew rice on the lower flat areas and maize on the higher mountain slopes and relied heavily on gathering and selling non-timber forest products from the nearby forests (Xiong and Zhu 2006; Liang 2017). In the past decade, with the drive of the market and policy guidance of the government, local people have gradually shifted to cash crops, such as coffee, citrus fruits, chestnuts, and walnuts. The current buffer zone of the GNNR was established by incorporating a large portion of what were community forests of Hanlong into the PA. This has greatly limited the use rights of the villagers and caused conflicts between the PA management and local communities (Xiong and Zhu 2006). The diverse habitats created by the closed forests of the PA and more open and mosaic farmlands make Hanlong and its surrounding area ideal for a great diversity of birds.

Hanlong has gained popularity among birdwatchers, photographers, researchers, and nature lovers since the 1990s. In recent years, accompanied by a domestic tourism boom in China (Zheng and Ryan 2012), GNNR has been visited by a rapidly increasing number of visitors who have a strong interest in photographing the variety of bird species, not only in the PA itself, but also at the interface of the farmlands and buffer zone forests of the PA. Compared to the professional ornithologists and conventional bird watchers, who are more interested in walking through the forest trails, many photographers prefer to stay in the community to photograph the birds. In 2009, to cater to the specific interests of those more sedentary photographers, the villagers of Hanlong started to build small hides and water ponds in their contracted forest lands, and they charged fees for the photographers to rent hides to photograph the birds that are attracted to the water ponds (Basnet and Wu 2018) (Figure 2).

Baihualing (25°16'44"N; 98°48'13"E; elevation: 1175 masl) is close to Hanlong. The village center is about 350 m lower

FIGURE 1 The study area in the context of the area covered by the Landscape Initiative for Far Eastern Himalayas (HI-LIFE) and the Hindu Kush–Himalayan (HKH) region. NNR, national nature reserve; NP, national park; WS, wildlife sanctuary. (Map by Kabir Uddin)

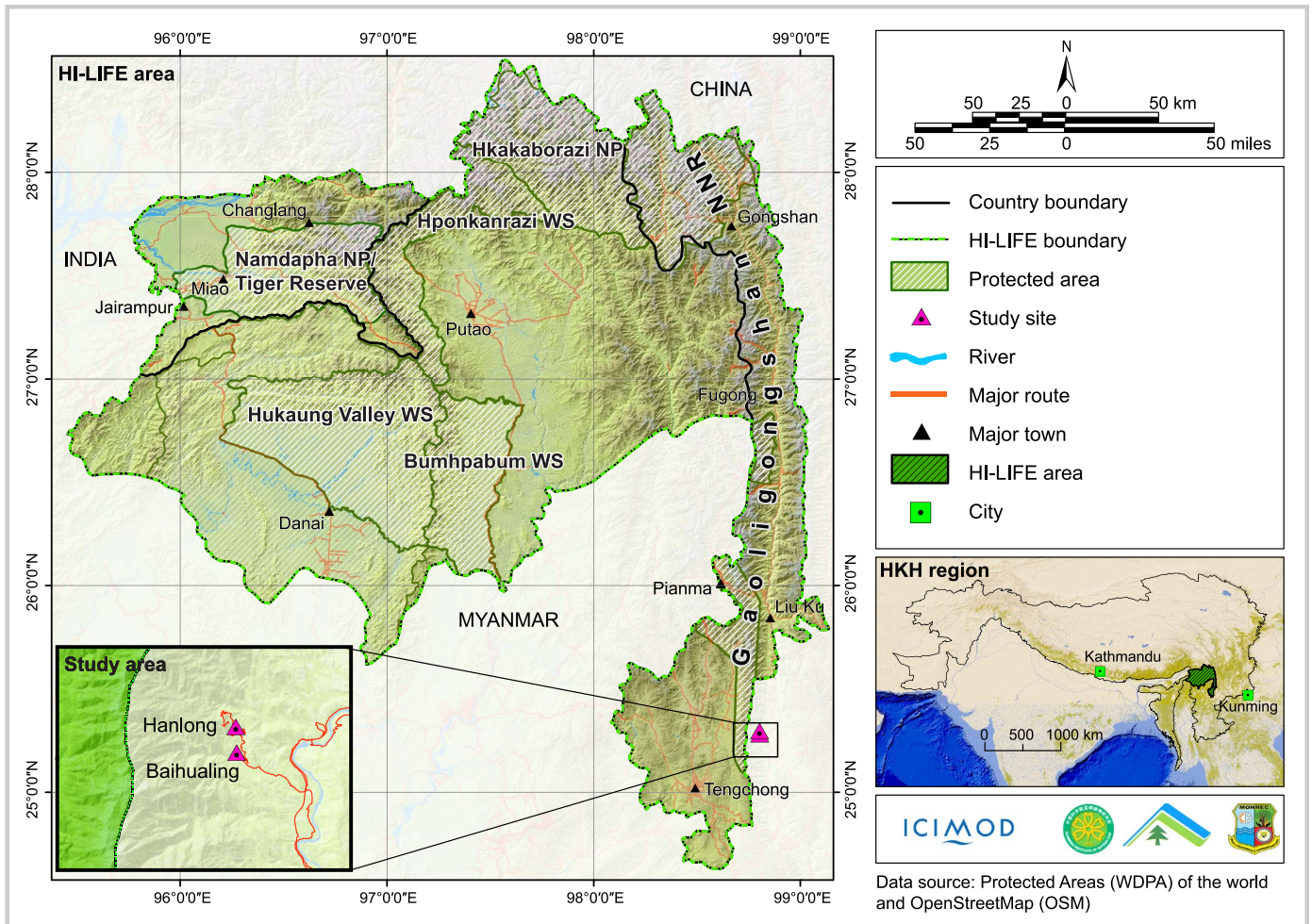


FIGURE 2 Photographing birds near a watering point from inside a hide. (Photo courtesy of Gaoligongshan National Nature Reserve, China)



than that of Hanlong. Generally speaking, it shares a similar socioeconomic, cultural, and historical background with Hanlong. However, since it is at a lower elevation, it has better thermal conditions and is more suitable for some tropical crops, such as dragon fruit and coffee trees. Baihualing is much less involved in tourism development than Hanlong. Instead, the villagers are mostly engaged in growing fruits and coffee; they also work as wage laborers, tourist guides, porters, and in transportation. In 2017, Baihualing had 97 households and 435 people; around 48.5% households had family size of 3–4 members, and 43.3% had 5–6 members.

In both villages, the inhabitants are a mixture of Lisu, Yi, Bai, Dai, Han, and other ethnic groups.

Methodology and data collection

A combination of approaches was used to collect information. Gray literature, including government documents, was also collected and analyzed to understand the historical and policy contexts of the study area.

Focus group stakeholder discussions: Three focus group discussions were conducted in 2017, each with more than 15 rangers, GNNR PA managers, and villager representatives from Hanlong and Baihualing. The aim was to understand the influence of bird-watching tourism on nature and the livelihoods of the local people, determine the status of the bird-watching tourism development model in Hanlong, and explore people's perceptions about conservation and the development.

Household survey: A semistructured household interview collected household information on their incomes from bird-watching tourism, degree of participation, utilization of forest resources, environmental awareness, and biodiversity knowledge. A census approach was adopted in both the villages. Using a predesigned questionnaire, we surveyed all 50 households of Hanlong and 97 households of Baihualing except for a few families where no household member was available during the time of survey (2017). The data were analyzed using Microsoft Excel. See Table 1 for some basic facts on the respondents.

Key results and findings

Bird photography contributed significantly to the household economy of Hanlong

Annually, half of the households in Hanlong earned up to CNY 20,000 (1 USD = 6.89 CNY in April 2017), 16% earned CNY 20,000–40,000, and 10% earned CNY 40,000–60,000 from tourism. Three households were able to earn more than CNY 80,000 from tourism services related to bird photography in 2017. This cash contribution to the household economy in Hanlong is remarkably high in view of the average per capita disposable cash income overall for the rural population: CNY 11,390 in 2017 for Longyang District (Wang 2018) and CNY 10,321 for Baoshan Prefecture (Baoshan City Bureau of Statistics 2018).

The significance of the economic contribution from bird photography tourism to Hanlong can be further illustrated by comparing the total and major sources of income between Hanlong and Baihualing. As is shown in Figure 3, the economic sources for households in both villages were

TABLE 1 Demographic details of the respondents from Hanlong and Baihualing.

| Demographic | | Hanlong (%) | Baihualing (%) |
|-------------------|--------|-------------|----------------|
| Gender | Male | 74 | 54 |
| | Female | 26 | 46 |
| Age (years) | 20–29 | 10 | 11 |
| | 30–39 | 18 | 20 |
| | 40–49 | 36 | 38 |
| | 50–59 | 30 | 18 |
| | 60–70 | 6 | 13 |
| Education (years) | 0 | 24 | 20 |
| | 1–9 | 68 | 75 |
| | 10–12 | 8 | 4 |
| | 13–16 | 0 | 1 |
| | >16 | 0 | 0 |
| Ethnicity | Han | 56 | 61 |
| | Bai | 12 | 21 |
| | Lisu | 18 | 8 |
| | Dai | 2 | 4 |
| | Yi | 12 | 4 |

very similar, except that over 86% of the households in Hanlong had extra income from receiving tourists. In 2017, 74% of the households in Hanlong had an annual income between CNY 20,000–60,000, compared to only 54% in Baihualing. In Baihualing, 36% of the households had an annual income under CNY 20,000 compared to only 4% in Hanlong. This income difference can be explained by the additional contribution of bird-watching tourism in Hanlong (Figure 4).

Bird photography tourism created considerable local employment

Bird photography tourism has created a range of community-based tourist services in Hanlong, including: food and lodging, transportation and porter provision, guiding, bird pond access, and sales of local specialties, souvenirs, and groceries (Table 2). In Hanlong, 86% of households are engaged in bird photography tourism in one form or another. Nearly one quarter of the households were engaged in at least 3 services: transportation, leasing out water ponds and hides, and providing guide services, though only 14% of host families provided services such as bird guides and bird ponds. In 2017, there were 21 hotels with more than 600 beds, which could accommodate around 700 tourists daily.

New institutions for self-governance emerged and knowledge of biodiversity increased

Focus group discussions revealed that Hanlong has undergone an interesting period of institutional evolution in terms of bird-related tourism. Bird watching tourism services and experimenting with sedentary bird photography

FIGURE 3 Major sources of cash income for households in Hanlong and Baihualing and percentages of households deriving income from these sources.

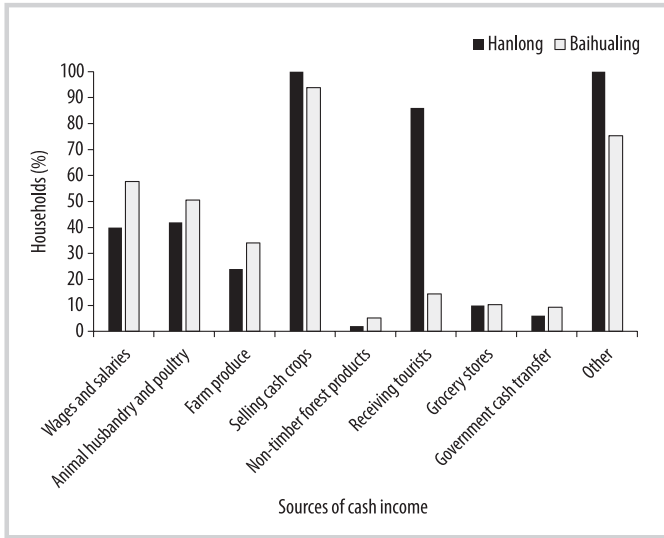
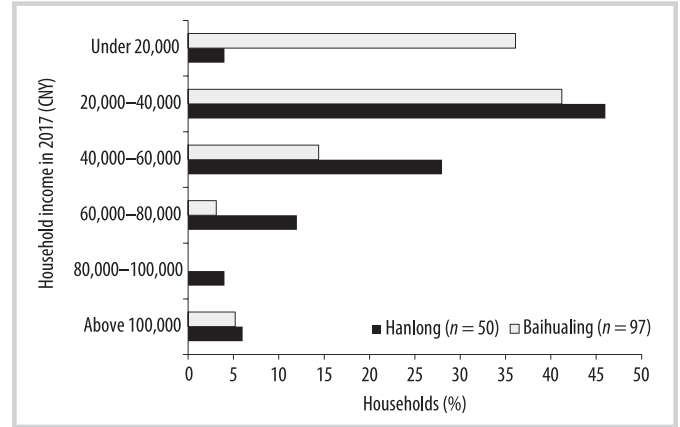


FIGURE 4 Annual household income (CNY) in Hanlong and Baihualing.



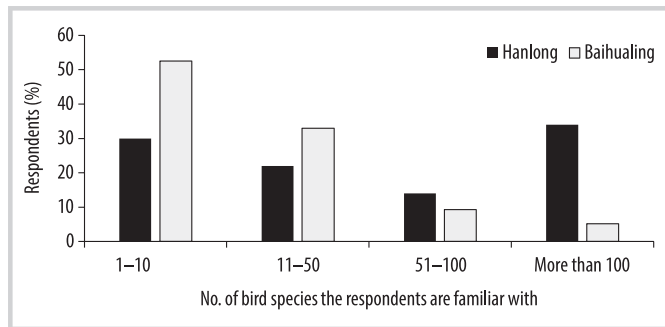
tourism in the village started with one family. With an increase in tourists around 2010, more households started building their own watering points. With each household competing to build its own routes, hides, and watering points, too many were built to be economically profitable. This also raised ecological concerns. In 2018, with the support of the village committee and local government, villagers decided to form a cooperative to manage the watering points and routes. The cooperative represented all

the households in Hanlong. A mechanism for sharing the income from each hide was established. As a result, the number of watering points and hides for bird photography and bird-watching in the area has been drastically reduced to 18 from over 70. A bird conservation association at the administrative village level was also formed to decide the number and location of the hides and solve conflicts.

Local people’s knowledge of birds has also increased. With the support of the photographers (many are ornithologists), local villagers, especially guides, can recognize a great number of birds by their Chinese names. In Hanlong, over 34% of the respondents could recognize more than 100 species of birds, and about 33% of them knew 50–

TABLE 2 Household participation in different bird photography tourism activities in Hanlong.

| Tourism activities | Households (no.) | Households (%) |
|---|------------------|----------------|
| Accommodation and food facilities + guide + hide and watering point + souvenirs + transportation + groceries | 1 | 2 |
| Accommodation and food facilities + guide + hide and watering point + agriculture products + transportation + groceries | 2 | 5 |
| Accommodation and food facilities + guide + pond + transportation + groceries | 2 | 5 |
| Accommodation and food facilities + guide + pond + transportation + agriculture products | 1 | 2 |
| Accommodation and food facilities + guide + pond + transportation | 5 | 12 |
| Accommodation and food facilities + transportation + groceries | 1 | 2 |
| Accommodation and food facilities + guide + transportation | 2 | 5 |
| Guide + pond + transportation | 10 | 24 |
| Guide + hide and watering point | 6 | 14 |
| Guide + transportation | 3 | 7 |
| Guide + agriculture products + transportation | 4 | 9 |
| Guide + agriculture products | 1 | 2 |
| Accommodation and food facilities | 1 | 2 |
| Hide and watering point + agriculture products + transportation | 1 | 2 |
| Hide and watering point | 2 | 5 |
| Hired labor (eg porter) | 1 | 2 |

FIGURE 5 Knowledge of bird species in Hanlong and Baihualing.

100 species. One villager could recognize nearly 400 bird species and became the favorite guide of visiting bird watchers. In contrast, in Baihualing village, only 5% of the respondents were able to recognize more than 100 species of birds frequenting the village, and most of them could name fewer than 10 species (Figure 5).

In focus group discussions, participants said men play a more dominant role in tourism, both in terms of time and number of times they participate within a year. However, bird photography tourism does create more opportunities for women's participation in economic activities, such as providing hospitality services. Bird photography tourism has improved women's knowledge, enhanced their visitor management and hospitality skills, and increased their exposure to new ideas.

Household dependence on direct use of forest resources was reduced

In both Hanlong and Baihualing, less than 5% of the households reported that they still collected forest products from nearby forests, except that 20% of households in Hanlong collected ornamental plants and 8% in Baihualing collected fodder. There has been an overall decrease in forest resources collection over the past 5 years as mentioned by the respondents. In Hanlong, the percentage of people who reported changes in forest product collection over the past 5 years was much higher than in Baihualing. In Hanlong, among those who reported changes, between 93% and 98% said that there was a decrease in the collection of timber, firewood, fodder, wildlife, medicinal plants, and

forest food. Notably, a high number of respondents reported that the collection of ornamental plants had increased in Hanlong (Table 3).

Villagers mentioned that strict enforcement of PA management regulations, availability and affordability of electricity and natural gas, increasing engagement in tourism and other off-farm opportunities, and a shift to brick houses have led to this decline.

Discussion

Bird photography tourism offers new opportunities for sustaining local livelihoods and biodiversity

Bird photography tourism as practiced in Hanlong offers a good example of how biodiversity resources can be converted into assets and capital for mountain development through local innovation. Considering the large number of farmers in China who rely on outmigration for their livelihoods, the economic contribution of bird photography to local employment and the economy is remarkable. With adequate governance and scientific support, it offers new opportunities for integrating the goals of sustainable development (United Nations 2015) and biodiversity conservation (CBD 1992) in conservation priority areas. As the Gaoligongshan-Salween area landscape has been defined by the Chinese government as an "ecological redline" area or "ecological safeguard" zone (Meyer et al 2017), such opportunities also offer hopes for impoverished local communities whose use of local forest resources has to be limited for the benefits of the greater public.

The bird photography tourism model, modified from the traditional trekking type of bird-watching, is based on nonextractive use of the rich local biodiversity. It has successfully capitalized on the booming Chinese domestic tourism market to create an economy of scale, leading to participation and benefit sharing within the community. Most importantly, the increase in overall household income has decreased the community's dependence on the direct use of local forest resources. China is using tourism as a major driver for poverty reduction (Ashley and Mitchell 2009; Gao et al 2009; Feng et al 2018). However, adequate institutions and policies are needed to make sure that the targeted poor communities and households can participate in and benefit from tourism in a meaningful way to achieve economic

TABLE 3 Perception of respondents of changes in forest product collection by households over the 10 years before the year of study (2017).

| Forest resources | Hanlong | | | Baihualing | | |
|-------------------|-----------------------|---------------|---------------|-----------------------|---------------|---------------|
| | Changes perceived (%) | Decreased (%) | Increased (%) | Changes perceived (%) | Decreased (%) | Increased (%) |
| Timber | 92 | 96 | 4 | 38 | 97 | 3 |
| Firewood | 100 | 98 | 2 | 80 | 99 | 1 |
| Fodder | 74 | 97 | 3 | 40 | 79 | 21 |
| Wildlife | 62 | 97 | 3 | 30 | 93 | 7 |
| Medicinal plants | 58 | 97 | 3 | 28 | 93 | 7 |
| Ornamental plants | 46 | 57 | 43 | 26 | 80 | 20 |
| Forest fertilizer | 68 | 97 | 3 | 33 | 84 | 16 |
| Forest food | 54 | 93 | 7 | 38 | 95 | 5 |

prosperity (Mahadevan and Suardi 2019). The household plus cooperative model of tourism participation in Hanlong offers a good example of community-based tourism development that can be used as a model for other parts of China.

With increased incomes, skills, knowledge, and self-governance, the villagers quickly grasped the new opportunities and became better able to adapt to the changing environmental and socioeconomic context.

Why do Hanlong and Baihualing differ in tourism development?

Hanlong and Baihualing are adjacent to each other, yet Baihualing's participation in tourism, including bird photography tourism, is rather low compared to Hanlong. A few factors stood out during discussions with local people:

- Location of the village: Hanlong is located at the entrance to the GNNR, and a section of what remains of the historical Southern Silk Route passes through the village before winding through the GNNR and going further west. The village therefore has been used by PA management staff, scientists, and bird watchers as a rest point for entry into the reserve or its buffer zone. Local communities have experience providing paid services as porters and guides, and providing accommodation to visitors. In the process, they have also gained scientific knowledge about local biodiversity and the environment. In mountain areas, location is often a major determinant for opportunities.
- Changing agents and local leadership: In Hanlong, one villager (Mr Hou) played an important role in the development of bird-watching and bird photography tourism. Mr Hou is open, literate, and business-minded. His family was among the very first to provide a guide to visiting ornithologists and gained a lot of experience and knowledge in the process. In 2009, with the advent of large numbers of photographers visiting the area, the family started experimenting with new ways to provide services to the tourists. Their success and practice inspired other villagers to follow. As more villagers joined in, the local village committee organized and helped the village to develop self-governing institutions and mechanisms.

The different levels of tourism participation between Hanlong and Baihualing indicate the niche nature of bird photography tourism and have implications for scaling up this livelihood approach in mountain areas.

External support is important for transformational changes in local livelihoods and institutions

Local leadership, networking, and external support are all important factors in the process of local transformation and reorganization (Ostrom 1990; Berkes and Folke 1998; Berkes et al 2003; Holling and Gunderson 2002). In developing bird photography tourism to gain economy of scale and transform local livelihoods, 5 major groups of external supporting agencies played important and sometimes critical roles. They created an enabling policy environment, shared knowledge, generated required information, brought new experiences, helped with marketing, and improved local tourism practices. They included local governments, the departments for forestry and PAs, scientific institutions, professional clubs (eg China Birdnet), and international

development and conservation organizations (eg ICIMOD and the MacArthur Foundation) (Table 4).

Wider replicability of the Hanlong experiences

The Far Eastern Himalaya Landscape has at least 9 Important Bird and Biodiversity Areas (BirdLife International 2007a, b, c) and is known for its extremely rich bird diversity. Over 800 bird species have so far been recorded in the landscape (ICIMOD 2020). The successful experiences of Hanlong offer good options for those local communities who are mired in poverty amidst a wealth of biodiversity assets. However, the niche nature of such tourism opportunities means that extra caution should always be taken in adapting to local conditions. More importantly, tourism should be developed with minimum impact on the ecological behavior and environments of the birds. This can be achieved with the support of scientists and the presence of good governance systems.

Conclusion and recommendations

Bird photography tourism development in Hanlong demonstrates that the goals of biodiversity conservation and sustainable community development are achievable at the community level. The entrepreneurial spirit of the local communities, the enabling role of governments, and the technical support from nongovernmental organizations and scientific institutions are important factors in enhancing local innovations for transformative changes and increased adaptability. With their low economic entry threshold, broad-based participation, economy of scale, and nonextractive use of the natural resources, such local innovations strongly support China's national policies on rural revitalization, ecological civilization, and targeted poverty alleviation (Liu and Wang 2019). The experiences in Hanlong offer a good example for sustainable community development and adaptation in conservation priority areas.

We recommend the following areas for improvement, although some are only possible through government policy support:

- Adopt a landscape approach to integrate local farming practices and bird photography tourism. Bird photography tourism has become one of the pillars of the local economy and has a great potential to become more sustainable. Holistic policies and a landscape (even transboundary landscape) approach to planning should be adopted to encourage farming practices and land uses that could sustain bird diversity. For example, policies could promote organic farming, ban the use of chemical fertilizers and pesticides, and encourage crop diversification.
- Establish a strict code of conduct. Since bird photography tourism is a new enterprise in the region, overall guidelines and standards need to be developed to regulate the business operations, taking into account ecological considerations.
- Strengthen the tourism value chain through measures such as improving hospitality services to attract more high-end tourists, increasing use of locally produced materials for food, developing tourism souvenirs, and exploring new tourism products.

TABLE 4 Major agents and their roles in supporting bird photography tourism in Hanlong.

| Agents (length of time) | Functions and roles |
|---|---|
| Local governments (at prefecture, district, and township levels) (from early 2000s) | <ul style="list-style-type: none"> Developed policies supporting tourism development as a major drive for poverty alleviation in the study area. Made considerable investments to improve local access to roads, clean water, electricity, mobile phone service, and Internet connection. Intervened in a timely manner to support the local communities in starting to set up institutions to regulate bird-watching and photography tourism, and to provide conflict resolution. Through its media, helped to promote the village as a destination for nature education, bird-watching, and bird photography. |
| Forestry department and PA management departments (from 1990s) | <ul style="list-style-type: none"> Brought and introduced scientists to local communities. Allowed communities to carry out bird-watching and photography tourism in the interface of the GNNR and the community forests. Engaged local communities in conservation activities. Promoted sustainable natural resources management technologies in the local communities. Promoted local tourism through its network. |
| Scientists (eg from the Chinese Academy of Sciences, Southwest Forestry University, Yunnan University) carrying out research in the area (from the 1990s) | <ul style="list-style-type: none"> Generated local biodiversity information and provided it to local communities to be used for tourism. Shared scientific knowledge on local biodiversity including birds and plants. Linked Hanlong to scientific organizations. Collaborated with local communities in organizing nature education tours. |
| China Birdnet (www.cnniao.com; and other professional clubs) (from 2016) | <ul style="list-style-type: none"> Organized annual bird photography contest in collaboration with local government, where the contests brought together professional photographers across China to Hanlong. Promoted Hanlong through its network. Trained local community on tourism guides, hospitality, photography, and biodiversity knowledge. Generated good photos of birds and lists of bird species in local area. |
| ICIMOD (www.icimod.org; and other international organizations) (since 2015) | <ul style="list-style-type: none"> Organized stakeholder discussions on areas of improvement. Carried out assessment studies for policy recommendations to local governments. Brought in regional experiences and knowledge. Supported government staff to visit Nepal for ecotourism development. Promoted local experiences at regional level. |

- Build the capacity of local communities in guiding, driving, cooking, marketing, and processing and selling local products.

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