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Developing co-management for conservation and local development in China's national parks: findings from focus group discussions in the Sanjiangyuan Region

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Environmental protection in China has progressed significantly in the past decades, including introduction of more collaborative approaches in the management of protected areas and the establishment of a new national park system, and many milestones have been achieved. While such developments are driven largely by national and global goals, the people who are most affected are those who reside in the protected landscapes. A range of strategies have been proposed and tried in relation to local development, with many important lessons learned, yet little has been heard to date directly from the community stakeholders themselves. In this study we report on feedback and recommendations received from focus group discussions in vicinity of China's first national park, Sanjiangyuan, regarding lived experiences of "community co-management" by Tibetan herders and local officials. Overall, the most recent National Park model is deemed successful, albeit with some notable perceived limitations. Focus group discussions' participants recommend more balanced compensation opportunities including for communities living outside but in close proximity to the park, eased restrictions on ecotourism, provision of public services for communities in the park (especially waste management and health care) and establishing a more effective compensation or insurance system to offset economic losses due to wildlife damage.

KEYWORDS

Socio-ecological systems, environmental conservation, environmental policy, empowerment, gender dimensions, Tibetan Plateau

Highlights

- Critical policy analysis was used to assess the Sanjiangyuan National Park in China's Qinghai Province, a massive area of national and global importance for watershed, biodiversity and cultural conservation.
- A critical review of policy documents and the scholarly literature clarifies the recent history and practice of integrated environmental management and community development in the area, culminating now in the “one household, one post” co-management system.
- Implementation of the “one household, one post” co-management system has massive implications for the ecosystems and for the well-being of the many local communities that are located within and adjacent to the National Park.
- There is a perception of unfairness to people who live outside but adjacent to the park, who bear many of the costs but few of the benefits associated with the national park.
- There is currently limited capacity of the community wardens to effectively perform their monitoring, conservation, and community liaison roles.

1 Introduction

The need for sustainability is broadly agreed globally. On this basis, the Sustainable Development Goals (SDGs) and even more recently the Global Biodiversity Framework (GBF) have been adopted to help us collectively end poverty, protect the planet, and ensure prosperity for all (see UN Resolution 70/1, Transforming our world: the 2030 Agenda for Sustainable Development (United Nations General Assembly, 2015)). These goals are ambitious, integrated and holistic, and virtually every government and stakeholder group recognizes they must play their part, from high-level formal policies and legislation at international, national and sub-national levels to the grounded commitments and actions taken by the general public both individually and through civil society and the private sector (Bryan et al., 2018; Muiderman et al., 2022).

However, with increasing regional and international connectivity (cf. globalization), the approaches adopted and decisions made in one place also impact communities and situations elsewhere, often in ways well beyond the scope of the original intended areas or sectors of focus. Additionally, sustainability-oriented goals alone rarely drive all decisions. Political, economic, and environmental factors bring trade-offs such that, at best, we can hope for science-informed if not actually evidence-based decisions. Further, questions of ‘who’ should be involved in planning and decision-making (i.e., governance) are equally as important as the ‘what’ (i.e., the particular decisions made, e.g. management prescriptions) (Foggin, 2018). However, whatever the processes followed or challenges encountered, learning from experiences and channeling important lessons learned into future development programs and actions are of paramount value (Lalancette and Charles, 2022).

Many studies have focused on the importance of co-management and key influencing factors. However, the majority

of research has focused on the macro level (Daim et al., 2012; Risvoll et al., 2014; Nchanji et al., 2021). For example, Khwaja (Khwaja, 2004) examined the impact of co-management on development project outcomes and found that co-management may not always be desirable. In practice, the shortage of professionals may also limit the form and extent of community participation in protected area management. Marcus (Marcus et al., 2004) pointed out that most “participatory” projects are initiated and directed by outsiders, have very short time frames and focus on the trial and practice of technology failing to achieve sustainable development. Conversely, good co-management practices are creative attempts by local communities to solve problems they face. While co-management has been well studied in other contexts, participatory research in China's national park areas is still but nascent (Zhang and Zhang, 2017; Foggin, 2018; Wang J, 2019; Wang et al., 2021a). As described by Breitzkreuz and Swallow (2019).

This paper seeks to contribute to the goal of further linking China and the rest of the world in matters of environmental management and conservation by analyzing recent experiences in China and making them more widely known outside the country, as well as connecting the reported experiences in China to global ‘best practices’ and simultaneously making these better known within the country. We give special attention to local reactions as elicited through focus group discussions and derive important lessons to help guide future programming. The Sanjiangyuan region, Qinghai Province, is offered as case study for listening and responding to local voices about how co-management has been practiced and how it has affected livelihoods, as well as local reported perceptions regarding environmental impacts of the national park (Qinghai Provincial Government Office, 2014; Xinhua News Agency, 2015; China News Network, 2018).

Most significantly, as begun here in this study – and made possible through the co-management model that is already being trialed in the Sanjiangyuan National Park – it is essential to recognize and listen to local voices, with their local perspectives; as mutual understanding across stakeholder groups, integrating multiple ways of knowing, and co-creating solutions are all necessary for developing viable models of regional conservation and development (Relva and Jung, 2021; De Vos et al., 2022).

2 Methods

We used a mixed-method qualitative research design broadly used for critical policy analysis as applied in India by Breitzkreuz et al. (2017) and described in greater detail by Breitzkreuz and Swallow (2019). The first element of this approach was to review key documents describing the sustainable development and conservation policies and plans that China has implemented since 1994 at national level and in the Sanjiangyuan region, with special emphasis on Sanjiangyuan (Three Rivers’ headwaters) National Park area. This helped us to better understand the evolving policy objectives as well as the local implementation of those policies. The second element centered on a series of contemporary focus group discussions designed to elicit the perspectives and experiences of the people in the local area who are most exposed to the impacts of the

policies. This aligns with the tradition in critical ethnography that recognizes the best way to understand a social process is from the inside. While this approach does not allow us to isolate specific success indicators or cause-effect relationships (China News Network, 2021), it does allow for the “subjective voice” of the end users – those who are most directly affected by the policies – as well as the views of local officials to provide critical insights into the local contexts and policy implementation in the focal areas. As described by Breikreuz and Swallow (2019), this approach to critical policy analysis adds to the literature on multi-dimensional microanalysis (Novotn et al., 2013) and the combination of methods allows us to understand how policies have been implemented in the local contexts and how they are affecting local people and local to regional development. Although the specific results of this study may not be generalizable to all China, we believe the insights gained will contribute to a deepened understanding of several key aspects of environmental policies affecting the Sanjiangyuan National Park and may contribute to the review and possibly revision of the critical new directions and approaches in environmental conservation in China, particularly conceptual models highlighted in the launch of China’s national park system¹.

We approached the policy review in three complementary ways, progressively moving toward a more complete understanding of the context operating in the Sanjiangyuan area. The first approach was to review the international literature, primarily in English language, on the dynamics of social-ecological systems and co-management arrangements involving government and local communities, including indigenous communities. Our case study area is a traditional home of the Tibetan people who have relied on livestock grazing for much of their livelihood and who have a distinct culture, language, way of life, and sense of identity. The second approach was to review policy documents and proclamations of relevant government agencies at national level, by the Qinghai Provincial government (Qinghai Provincial Government Office, 2021), and the administration of Sanjiangyuan National Park itself. Most of those documents are only available in Chinese language. New developments over the last four years have been tracked in real time. The third

approach was based on Chinese scholarly literature exploring the Chinese experience with environmental protection and ecological transformation. Our policy review – as presented here – iterated between these three different but complementary approaches.

Local perspectives on policies were generated through focus group discussions. A total of 12 focus group discussions were conducted, with a total of 219 participants. We used focus group discussions because they are an effective way to collect a large amount of data on a particular issue, information that may be little known but, once highlighted, can be used to identify key topics for further exploration (Morgan, 1997). A pilot focus group discussions was conducted in the Yellow River headwaters² in July 2018 to explore the focus group members’ concerns with the policies that had been implemented in the area and to determine whether this focus group method could be effective for collecting relevant data. Another 12 focus group discussions were conducted in July 2020 at 4 sites. In each site, we convened three focus group discussions: one with only male residents, one with only female residents, and one with representatives of local government administrations and park management agencies. Participants in this study provided voluntary and written informed consent. Each focus group consisted of 5 to 20 participants, with an average of 12 participants. The discussions lasted 90 to 120 minutes; due to the special situation of Covid-19, we could not provide refreshments to participants. The broad, open-ended questions that guided the focus group discussions are shown in Box 1, below.

3 Background

3.1 Major geographies

The Qinghai-Tibet Plateau encompasses around one fourth of China’s land area and provides many benefits, nationally and globally, especially in terms of the ecosystem services deriving from the headwaters of the many major Asian rivers originating on the plateau (Foggin, 2016). Around 3 billion people rely on the

Box 1 Questions for focus group discussions survey

- a) Please describe the recent history of the national park.
- b) What are the different ways in which people are affected by the park?
- c) Who is most positively affected by the park in this area, and why?
- d) Who is most negatively affected by the park in this area, and why?
- e) What has been done, or may be done, to improve the situations of people who have been negatively affected?

¹ On October 12, 2021, at the 15th Conference of the Parties to the Convention on Biological Diversity, China officially established its first batch of national parks, they are Sanjiangyuan National Park, Giant Panda National Park, Siberian Tiger and Leopard National Park, Hainan Tropical Rain Forest National Park, Wuyi Mountain National Park. The total protected area is 230,000 square kilometers, constituting nearly 30% of the land area under national key protection (People’s Daily, 2021).

² The Sanjiangyuan National Park has three main sections, the headwaters or source areas of the Yangtze (Changjiang) River, the Yellow (Huanghe) River, and the Mekong (Lancang) River. These three main sections of the Sanjiangyuan National Park are administered quasi-independently albeit in coordinated fashion. Additionally, in China, each of these three sections is often referred to as an independent national park, even though all three are technically part of the single larger, tripartite Sanjiangyuan National Park.

life-giving water resources of these great rivers and their watersheds. The Qinghai-Tibet Plateau itself is often called the ‘third pole’ of the world because of its extensive area and very high elevation. Even more strikingly, the plateau’s simple presence and its land cover (including annual snow cover) affect global climate systems, particularly through characteristics of the Asian monsoon (Yang et al., 2011). Ecologically, four main ecosystem types are identified: alpine meadows, alpine grasslands, alpine deserts, and alpine shrubs (Long et al., 2008; Xinhua News Agency, 2017). Together, these vegetative communities provide the basis for pastoralist livelihoods that developed over millennia (Foggin, 2021). The Qinghai-Tibet plateau is thus a region populated not only by unique and diverse wildlife but also by Tibetan herders whose livestock have long provided for their necessities and well-being (Gruschke, 2012). Overall, the plateau constitutes one of the world’s most extensive integrated socio-ecological systems (Cong et al., 2015).

The Sanjiangyuan area – that is, the headwaters of the Yangtze (Changjiang), Yellow (Huanghe) and Mekong (Lancangjiang)³ Rivers – is located in the heart of the Qinghai-Tibet Plateau (Foggin, 2008; Shao et al., 2013; Yan et al., 2017). It covers an area of 363,000 km², or about half of Qinghai Province (Du, 2012). Because of the great ecological significance of the area’s biodiversity and its important water regulatory functions for the entire country and globally, around half of the Sanjiangyuan area (153,000 km²) was designated as a national nature reserve in 2000 (Sheehy et al., 2006; Li W. et al., 2020), an area equivalent to England and Wales combined. Most of this vast area (123,100 km²) was recently re-designated as a national park, the most recent step in a series of significant policy changes seeking to reverse decades of unsustainable development decisions and actions that have greatly degraded ecosystems including grasslands, lakes and glaciers throughout northwest China (Shang, 2019; Wu et al., 2020). The Sanjiangyuan National Park is comprised of three contiguous sections that encompass the headwaters of the Lancang in the south (adjacent to Tibet Autonomous Region), the Yangtze in the south-central part, and the Yellow to the north-east (see Figure 1).

In parallel with these institutional changes over the past 20 years, as in other areas of the plateau and more broadly across the high mountain regions of Central Asia, the Sanjiangyuan area and its inhabitants remain vulnerable to a wide range of environmental, economic and sociopolitical factors, many of which originate outside their geographical areas yet greatly impact the environment and people’s lives and well-being. This is Globalisation 101, which operates in ways well beyond simple market integration. Environmental policies and climate change, for example, both affect mountain communities, the latter through shrinking glaciers and the changing seasonality and intensity of precipitation, thus impacting pastoralist livelihoods (Manandhar et al., 2017).

3.2 Protected areas in china

China has had high ambitions for its protected areas, largely developed following the model of strict nature reserves. In fact, China has established a vast network of nature reserves since 1956, now with 2,729 nature reserves nationwide, covering about 15% of the country’s territory. State-managed reserves cover two-thirds of this area (Cao et al., 2015; Guo and Cui, 2015). More broadly, there are over 10,000 protected areas (including nature reserves) covering about 18% of the country’s land area, including forests, geological parks, wetland parks, world natural and cultural heritage sites and scenic spots (Zhu et al., 2019).

One of the challenges inherent in nature reserves is to find ways to balance nature conservation with the needs and socio-economic aspirations of local communities (Cao et al., 2021). The national park model has therefore recently been introduced in China, seeking to redress previous imbalances by integrating human activities with the protection of special habitats and regulating services (Li et al., 2016; Xu et al., 2017). The official plan of the national park system clearly stipulates that “national parks will be established to ... combine ecological protection and sustainable development” and that the primary difference between nature reserves and national parks “is that the latter can provide more social and economic benefits.... Any successful conservation and use of national parks should maintain a balance, so that they can provide both development opportunities and effective protection” (He and Cliquet, 2020). The National Park system aims, further, to advance China’s vision of “ecological civilization” (*shengtai wenming*) that has as goal the “harmonious development of people, nature, and society” (Sheng et al., 2020). The same authors also note that the national park system could help resolve two outstanding challenges from the previous model, that “the economic prioritization over social and ecological considerations that causes massive ecological degradation, and the conflicting, overlapping, and inconsistent administrative and institutional structures that result in serious inefficiencies and conflicts” (Sheng et al., 2020).

Sanjiangyuan National Park is the first national park established in China, with two parallel goals: environment protection, and social and economic development of communities. The expected launch of the national park was in late 2020, but due to Covid-19 this was postponed (Zhao et al., 2016; China Daily, 2020), and finally occurred on 12 October 2021 (People’s Daily, 2021).

Initially, each section of the national park was sub-divided into a core conservation area (core zone) where no human activity could take place, ecological conservation and restoration areas (buffer zone) where limited human activity can take place, and areas where traditional forms of natural resource utilization such as pastoralism can still occur (with different priorities or limitations based on ecological characteristics). Later, the three areas were re-organized and simplified into first- and second-level functional zones. The primary functional zone applies strict protection, focusing on snow-capped mountains, glaciers, rivers, lakes, wetlands, grassland meadows and forest shrubs. First-level protection severely restricts human activities in order to conserve water, soil, biodiversity and pristine ecosystems. The secondary functional

³ The river known as Lancang in China is known as the Mekong in international parlance. The 4,350 kilometer Mekong River drains southward through China, Myanmar, Thailand, Laos, Vietnam and Cambodia.

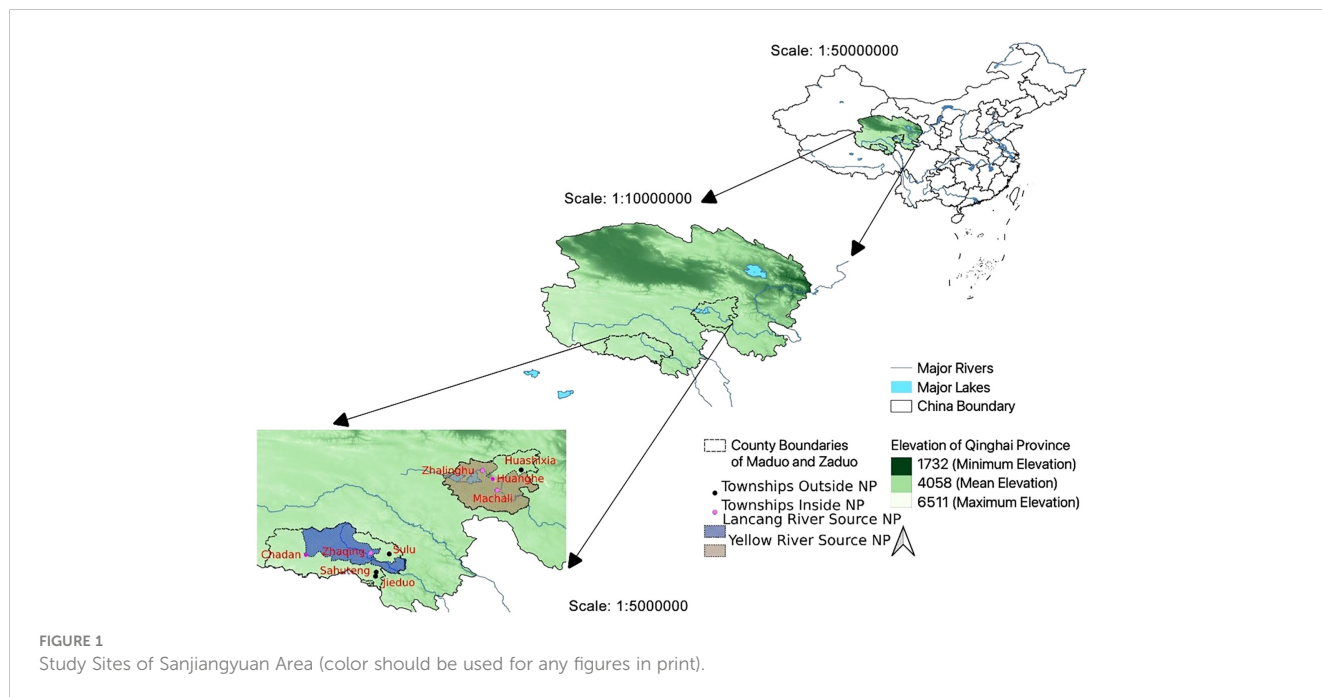


FIGURE 1 Study Sites of Sanjiangyuan Area (color should be used for any figures in print).

zone allows limited activity by the local residents as well as approved scientific research, but otherwise promotes conservation of protected areas, special habitats, and natural conservation areas (Sanjiangyuan National Park, 2021). There are a total of 53 villages located within the Sanjiangyuan National Park.

3.3 Evolving policy context

In order to understand the background and evolving contexts of the Sanjiangyuan region in terms of socioeconomic systems and development paradigms, we reviewed 13 government development policies in China since 1994 with special reference to the Sanjiangyuan area as well as to pertinent environmental hazards (Table 1). This information mainly comes from the relevant websites of the Sanjiangyuan National Park, supplemented by academic literature. Nature reserves are more exclusionary than national parks, thus the recent shift to a national park model better embraces co-management as compared to stricter command-and-control approaches – also consistent with China’s national ecological compensation policy (Hu et al., 2019) as well as further development and refining of the concept

of Ecological Civilization (Maxwell et al., 2020). Ecological Civilization has been written into China’s constitution as the ideological framework for the country’s environmental policies, laws and education. It is also increasingly presented not only as a response to environmental degradation in China, but as a vision for our global future.

In China and around the world, protected areas (or PAs)⁴ have been the most common tool used, in a formal sense, to promote nature conservation (Maxwell et al., 2020). Amongst protected areas in China, nature reserves continue to be the most common (Xu et al., 2017) even though they tend to separate people from nature, while national parks are still in preliminary experimental stages. Given the many known benefits of local-level engagement in PAs for both people and for nature, a critical question arises, *how can more community-centered approaches in conservation be integrated into nationally-endorsed plans and approaches?* Local communities remain the longest-standing custodians of the environment, and it is increasingly recognized that such communities are the best placed to contribute to broadly desired conservation outcomes. In light of this, a system of rangers or wardens from local communities has been trialed in the Sanjiangyuan area and now is integrated in the inaugural functioning of China’s first national park (Foggin, 2018; Yan, 2017). The development of Sanjiangyuan National Park over its 5-year trial phase built on earlier experiences that were initiated under the nature reserve model, when community co-management approaches and other forms of positive engagement with local people first emerged. The “one village, one post” (*ycun yidian*) collaborative conservation project was launched in 2006 by the

TABLE 1 Research sites (Four geographic categories of focus group discussions x 3 types of participants = 12 focus group discussions).

| | Towns inside national park | Towns outside national park |
|--|--|---|
| Mekong River National Park (Zaduo County) | Zhaqing, Chadan male, female, and gov/NP FGs | Sulu, Jieduo, Sahuteng male, female, and gov/NP FGs |
| Yellow River National Park (Maduo County) | Zhalinghu, Huanghe, Machali male, female, and gov/NP FGs | Huashixia male, female, and gov/NP FGs |

4 Protected areas, or PAs, come in many shapes and forms. PA is a generic term, not to be confused with particular models or approaches such as national parks, nature reserves, and a range of other formal, government-instituted systems.

NGO Plateau Perspectives together with the nature reserve, and it developed over several years with Tibetan pastoralist communities. “One village, one post” was subsequently scaled-up in the UNDP GEF-supported Qinghai Biodiversity Conservation Project (2013–18). This larger project enabled the further strengthening of the earlier co-management venture, helping to embed community-centric approaches into protected area legislation and practice at the provincial level (Foggin, 2018). Since trial development of the Sanjiangyuan National Park began in 2015, implementation of the even finer-scale “one household, one post” policy increased the income of 17,211 herders, helping to gradually improve their living standards. These ‘posts’ are the equivalent of ‘ranger stations’ – but instead of being a government built and administered post, i.e. a physical building from which monitoring activities are carried out, so-called ‘household posts’ are the location of each and every household resident in the national park (or nature reserve, as the case may be). They are ‘posts’ in terms of their physical structure and location, and ‘public’ inasmuch as they are run by the public, i.e. overseen by a selected individual per household. As each household has someone paid by the national park to provide agreed services, each household thus is recognized as serving a function of ecological monitoring.

4 Findings from the focus group discussions

Our analysis of the focus group discussions has yielded three main findings. First, the spatial distribution of community wardens inside and outside the national park is unequal and deemed unfair. Second, the establishment of the national park is generally perceived to have improved the environment and people’s lives both inside and outside the park, although elderly report that the environment has not yet recovered to the quality it was in the 1960s and ‘70s and women indicate that more needs to be done to improve women’s welfare. Third, some concerns still remain regarding the appropriate management of solid waste and mitigation of human-wildlife conflict in the park. The latter concerns, raised by focus group discussions, are further supported by discussions with researchers from the Northwest Plateau Institute of Biology, Chinese Academy of Sciences; and they are sometimes amplified in media reports, which tend to sensationalize such problems, overstating their degree and/or their extent).

4.1 Comparative analysis

Focus group transcripts were analyzed and major points of comparison drawn out. Table 2; Figure 2 shows the main results of the comparative analysis. The first comparisons are according to river basin, between the Yellow River Headwaters Park and Lancang River Headwaters Park (3.a); the second by gender (3.b); the third by location, inside versus outside the National Park (3.c); and the fourth by main stakeholder category, government versus resident (3.d). We did not detect major differences between the views according to age (i.e., older versus younger people).

4.2 Implementation of the community warden program

Almost all residents believe that the establishment of national parks has had a large positive impact on the environment and residents’ lives. The establishment of the “one household, one post” ecological management system has transformed (or in some ways, re-established) residents from simple users to guardians of the grassland. It appears that local residents feel well qualified for this job, and also feel a sense of accomplishment. Significantly, living standards have reportedly improved, as also has environmental quality within the national park.

The main selection criteria to participate as a community warden is to be between 18 and 55 years of age and capable of physical labour. Each family nominates the family member who will occupy the community warden position, with no gender discrimination noted. However, residents outside the national park do not benefit from this system to the same extent. First, the “one household, one post” has not been extended to all households outside but only those living in close vicinity of the park. Second, there are fewer environmental projects such as wildlife monitoring, grassland restoration and plateau pika control outside of the national park⁵. Although the local government has taken some measures to reduce the gap between people living inside and outside of the park boundary, such as skills training, more could be done for people living outside. Yet, due to stricter ecological protection and also the presence of wildlife in the national park, residents in that area do incur some additional costs (e.g., inability to benefit from tourism, weaker infrastructure, more human-wildlife conflict), which is deemed by authorities to justify the differential. Broadly speaking, though, local residents recommend that those living outside of the park should also benefit from the “one household, one post” policy, but with possibility for this to be at a reduced monthly salary of 1,400–1,800 CNY (approx. 220–280 USD) per month.

4.3 Environment

Elderly residents born in more challenging times said their lives have seen tremendous changes and they perceive national park policies as a form of social assistance – relative to their prior socio-economic deprivations, which current policies are now addressing at least in part. On the other hand, they report that current environmental quality is not as good as what they experienced when were young. Between 20 and 30,000 mu (1,333–2,000 ha) of grassland provided enough pasture for 1,500–1,600 Tibetan sheep, but now the same area can only support 500–600 sheep. In the past, Tibetan herders used oil lamps for lighting and there were no batteries or coal for heating, thus there was little pollution of the environment. Further, few if any plastic bags or plastic bottles were present in the 1960s to ‘80s, and there were no notable

⁵ Although we mention these so-called ecological activities, we are not in fact ‘endorsing’ them, as some work is counter to biodiversity conservation principles, especially the poisoning campaigns, which are effectively annihilating a very important keystone species of the plateau (Smith and Foggin, 1999).

TABLE 2 Focus Group discussions' results comparisons in the Sanjiangyuan area.

| 2.a Comparison between river basins | |
|---|--|
| Similarities | Differences |
| Human-wildlife conflicts are serious, but local residents have little awareness about insurance schemes and the government has not publicized compensation opportunities. | Lancang River headwaters Park residents feel that residents in the first-level functional area should receive more compensation and enhanced provision of services, compared to residents outside national park boundaries. |
| Disposal of solid waste is a common problem. | Boundary conflicts are considered to be an important hidden danger of environmental protection in the Lancang River headwaters Park area, both inside and outside of its limits. |
| There are few opportunities for education. | Harvesting of Cordyceps is damaging the land both inside and outside the Lancang River headwaters Park. |
| Women require better health care services. | Yellow River headwaters Park residents believe that people in the middle and lower reaches of the river and future generations benefit most from the park; Lancang River headwaters Park residents believe that local residents within the national park benefit the most. |
| Tourism should be developed as an income source for local residents. | Yellow River headwaters Park residents believe that local self-employed businesses, hotels, and tourism are most negatively affected by the park; residents in Lancang River headwaters Park believe that people outside of the park are most negatively affected |
| The establishment of the national park has had positive effects on the environment as well as on the lives of local residents. | Residents in the Lancang River basin advocate restoring the pasture lands (grasslands) and controlling plateau pika. ¹ |
| The work of the Women's Federation is much better than before. | |
| Young people need more job opportunities and everyone needs more training in financial management. | |
| There is no gender preference in selection of community wardens in the "One household, one post" system. | |
| Residents living outside the park should also be assigned as community wardens with one position per household. | |
| Environmental quality is reported as having significantly improved over 10 years. ² | |
| The salary of 1,800 yuan/month for each community ranger is insufficient. | |
| Table 2.b Comparisons between women and men | |
| Similarities | Differences |
| More information is needed about women's health. More comprehensive medical facilities are needed, especially related to women's health and mother and child health. | Men feel that female community wardens are more attentive, confident and diligent. In the past, women were not allowed to speak loudly in public, but they are now able to. |
| Young people need more job opportunities. | Women cannot get business loans, but men can, and women want to be treated fairly in this regard. |
| There is a lack of knowledge about financial management. (This issue also raised by both government officials and residents.) | |
| Table 2c. Comparisons between inside/outside the National Park | |
| Similarities | Differences |
| Tourism activities have been negatively affected by National Park rules and should be further developed (This issue was raised by both government officials and residents.) | Residents outside the national park feel unfairly treated as they are not allocated roles as community wardens. Most environmental projects are first implemented inside the national park. |
| Young people need more job opportunities. (This issue was also raised by both government and resident focus groups.) | Tourism is prohibited in the national park due to focus on strict ecological protection, whereas there are fewer restrictions outside the national park. |
| Each family outside the park should also benefit from the one household, one post policy, with a salary of 1400-1800 yuan/month. | |

(Continued)

TABLE 2 Continued

| 2.a Comparison between river basins | |
|---|---|
| Similarities | Differences |
| Table 2d. Comparisons between Government's and residents' awareness | |
| Similarities | Differences |
| Both groups recognize the tourism industry has been affected, and both consider that appropriate tourism should be developed. | Residents are unaware of the possibility of compensation for damages (losses) arising from human-wildlife conflict. |

¹Although, competition [of plateau pika] with livestock for food has been widely reported, especially in areas where pika densities were highest (Sun and Zhao, 2009), this has largely been refuted by more detailed vegetation and behavioral studies have recognized the plateau pika's fundamental role as keystone species. Extensive targeted poisoning campaigns aiming to control populations occurred repeatedly since the 1950s (Jiang and Xia, 1987), leading to huge losses in biodiversity but fortunately these have largely ceased over the past decade.

²The National Development and Reform Commission's comprehensive evaluation report on the ecological effects of protected areas in the Sanjiangyuan area highlights how that the main objects in the Three Rivers Source Area have been better protected and restored, the quality of the ecological environment has improved, water availability has increased year by year, and the grassland coverage, and grass productivity have increased by 11% and 30%, respectively over, the past decade.

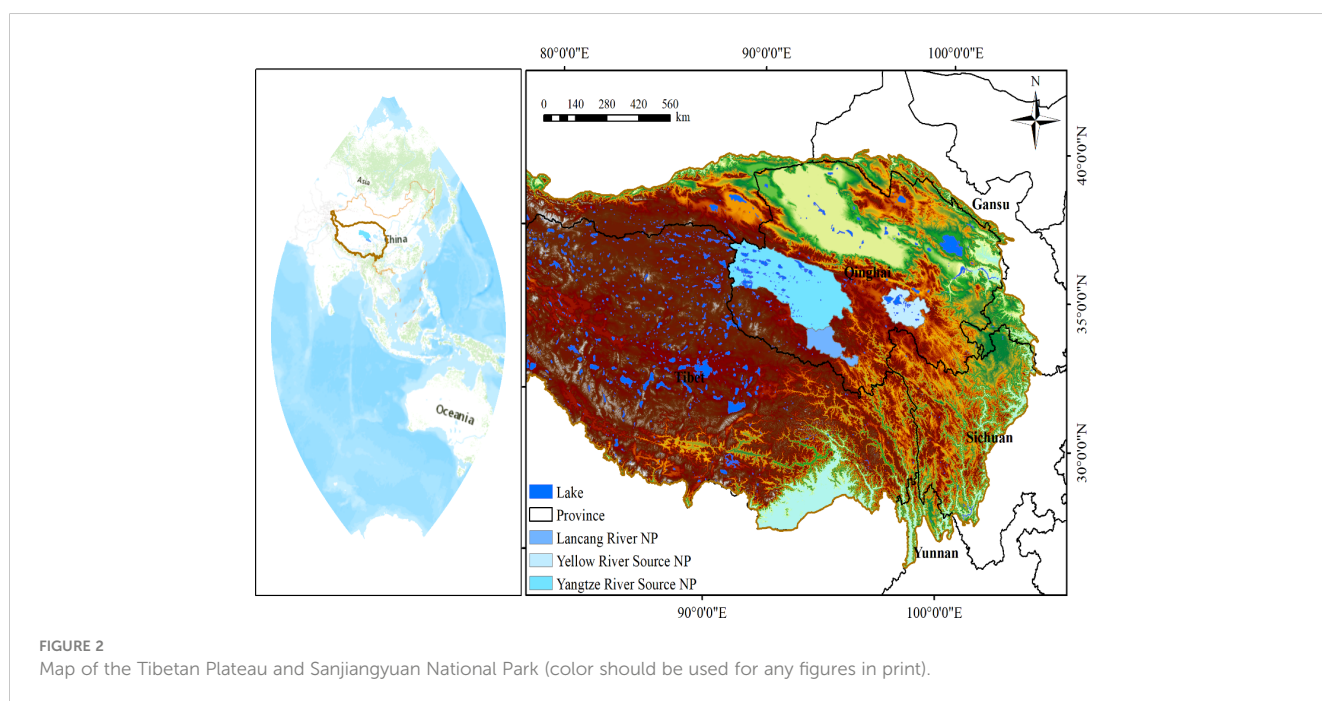


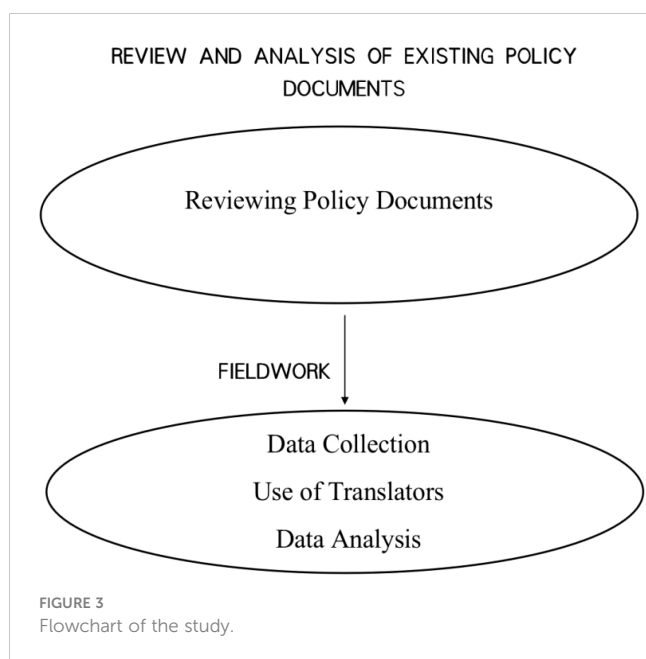
FIGURE 2 Map of the Tibetan Plateau and Sanjiangyuan National Park (color should be used for any figures in print).

problems with small burrowing mammals. Many respondents thus felt that environmental quality in more recent times, from ~2000 to 2016, was not very good. However, from 2016 to the present (i.e., since the establishment of the national park pilot), environmental quality is reported to have greatly improved, though it is still not as good as in the more distant past. Young residents also reported that environmental quality improved significantly over the past ten years⁶ (Figure 3).

6 Our results are “what the respondents have reported” and “what they feel/consider” – but not necessarily the actual case, i.e. may not be confirmed through other means. Timelines also can be blurred; and the fact the national park pilot began in 2015 does not mean that changes noted since then are necessarily due to the park's creation (even if reported by some respondents as such). Memory bias and the possibility that responses being could be influenced by the context of the FGs, including audience (i.e. who is present, e.g. government officials) are here noted, too.

With all such statements, however, while there may be correlation, we must not immediately imply causality when/where none can be directly/properly attributed. For example, a major snowstorm in 1985 that caused great losses to livestock and wildlife and a period of aridification with rapid extension of sand dunes and losses of streams and lakes in the 1980s and '90s and even into the early 2000s could also be behind other people's observations; the more recent changes noted may simply be ‘recovery’ from these abnormal situations (which are not themselves representative of longer-term baselines or averages)⁷. The most serious grassland degradation in the Sanjiangyuan area basically took shape around the mid 1970s, and generally continued until the mid 1990s. No sharp increase in grassland degradation occurred since then until the present (Liu et al., 2008).

7 It is worth noting that this article is only discussing peoples' perceptions, not directly a documenting the actual substance of what is being reported by the local community and/or the national park and government authorities.



Notably, however, affected by increasing human economic activities as well as global climate change, conflicts between people and nature in the Sanjiangyuan area have gradually increased over the last 15-20 years, with a sharp rise especially in relation to brown bear occurring since the mid 2000s.

4.4 Women

The selection of community wardens has not been discriminatory according to gender, and thus has upheld the principle of gender equality. Male residents generally acknowledge that female community wardens are more attentive and diligent than their male counterparts and that they have made vital contributions to environmental protection. The establishment of national parks has undoubtedly strengthened women's confidence. Most recently, the Women's Federation organized female wardens and female members during the Covid-19 pandemic to make donations and hold lectures on the prevention of transmission of the virus and organized them to visit impoverished student families and conduct community clean-up campaigns. At present 6-7 lectures are held each year, and the women's groups hope to increase the number of lectures on women's health. It was also noted that women desired better health facilities, e.g. for gynaecological health care. In addition, women cannot easily obtain commercial loans, while men can; women participants in the FGs expressed their wish to be treated fairly in this regard.

4.5 Ecotourism

Almost all residents think that it is an important to develop ecotourism activities. For example, residents of Huanghe and Huashixia towns in the headwaters of the Yellow River are collectively calling for the development of 'tourist villages' to contribute to improving

their livelihoods. Yet tourism has been banned since May 2017 in national parks. The establishment of national parks has thus had a serious impact on the local industry, such as locally owned, operated and staffed hotels and restaurants. Residents believe, however, that a viable model could be developed to meet both environmental and development goals, by limiting the number of tourists and offering more exclusive high-end ecotourism experiences.

4.6 Local ecological knowledge

Residents near the Yellow River Headwaters National Park discussed approaches for better restoring pastures. They proposed that Tibetan sheep should be used instead of yaks on degraded pastures, as Tibetan sheep fertilize the soil through their manure and the particular trampling action of their hooves (a behaviour that yak do not exhibit; Long et al., 2008)⁸.

In the Lancang River Headwaters National Park, local residents expressed concern regarding the use of poisons to eliminate the plateau pika; which have successfully eliminated some populations of the targeted species, but in addition also have led to loss of many other wildlife species including their natural predators – and thus, the use of poisons has caused serious long-term damage to the pasture and to biodiversity more generally. Residents instead argued in favour of natural methods, such as erecting scaffolds to attract more raptors (birds of prey) to grassland areas, allowing them to increase in number and control the pika through their hunting behavior.

Additionally, local residents proposed that ice-breaking operations be implemented in relevant parts of the national park. They reported that grassland fires occur every year because of the freezing of lakes in winter, leading to formation of natural convex mirrors that concentrate sunlight, causing grassland fires. The herders themselves already carry out ice-breaking operations each year to avoid such fires, but they highlight that further support in this would be helpful to them.

5 Discussion

In this section we draw upon the results of the policy review and focus group discussions to reflect on a number of important topics and questions of high relevance to the goals of environmental protection.

5.1 Is the community warden program a pro-woman intervention?

In the Sanjiangyuan National Park, the "one household, one post" model is consistent with the principle of gender equality. Each household nominates one warden and all wardens regardless of gender are paid the same monthly salary of CNY 1800. Male focus group participants asserted

⁸ While yak and sheep do indeed have different behaviours... there is also value in having diverse grazers, rather than single kind of grazing animal as multiple/varied pressures can lead to more resilient grasslands.

that female community wardens are more attentive and diligent than male wardens and that women also have become more assertive and confident and some have also begun to serve as village leaders. Despite these proposed gains, however, even with the establishment of the Sanjiangyuan National Park there remain some limitations for women. For example, women in the region still cannot obtain commercial loans, while men can, and women lack access to reproductive health services. As women's empowerment would be beneficial for both development and environmental protection (Duflo, 2012), we recommend that the gender effects of the National Park be fully assessed and remedial actions taken.

5.2 Community wardens

The Sanjiangyuan National Park has a strong “workforce” (*shengtai guanhuoyuan*) of community wardens. The wardens not only serve as environmental monitors, but also as protectors who detect infractions and serve as liaisons between the National Park and the wider community in which they live. The term ‘*shengtai guanhuoyuan*’ that permeates much of China's view on national parks is still somewhat oppositional, i.e. reflecting the view that the national parks need to be guarded from people who otherwise would contravene the regulations. Yet there is positive movement, too, such as through the continuing development of ‘co-management’ approaches, which are somewhat more participatory and inclusive (Brooks et al., 2013), even if not to the extent observed in other circumstances worldwide (Armitage et al., 2008).

To promote the unity of ecological protection and improvement of people's livelihoods, starting with the first phase of the Sanjiangyuan ecological protection and construction project, Qinghai Province has been exploring the implementation of the “one household, one post” model. As of May 2021, Qinghai Province has established a total of 81,668 community wardens across several protected areas, and arranged 1.35 billion CNY in subsidies every year (including 1.16 billion CNY from the provincial government in Qinghai Province and 190 million CNY from the central government). Especially since the pilot implementation of the Sanjiangyuan National Park system began, Qinghai Province has innovatively implemented the “one household, one post” system for ecological management and protection based on actual conditions, covering all herdsmen in the park area. Including 53 villages in the park, each household has a community warden, for a total of 17,211 community wardens, with average annual household income increasing by 21,600 CNY (Sanjiangyuan National Park, 2021).

The Park now has 19 management and protection brigades and 64 management and protection squads (Peng, 2018; Sanjiangyuan National Park, 2021). Poverty alleviation activities have been planned, although more could be done to advance the dual objectives. Appropriate training and tools would strengthen the ability of community wardens to help their communities develop in socio-economic terms and to achieve the protection goals of the national park (Foggin, 2018).

All the towns in Zaduo County are similar in geographical environment and have similar importance to the protection of the park. However, three towns – Sulu, Jieduo and Sahuteng – have not been incorporated into the national park, resulting in different incentives than the people living in towns located within the park's

boundaries. For example, community wardens living in these three towns need to carry out patrol work on grasslands far away from their homes. It is estimated that such community wardens incur an additional cost of 600-1,000 CNY/month for transportation (Sanjiangyuan National Park, 2021).

Another challenge with the community warden program is their formal education levels, which make it challenging to meet the required standard for an international and modern national park. Guards lack patrol equipment, technical measures for ecological protection are incomplete, and scientific and technological support is weak. It is therefore recommended that the relevant authorities make further investments in the systematic training and equipping of community wardens (Shang, 2019).

5.3 Promoting conservation and community development through ecotourism

Ecotourism provides both opportunities and challenges. Since becoming a national park pilot, the Yellow River Headwaters National Park Administration has issued the “Notice on Prohibition of Tourism Activities in the Zhaling-Eling Lake and Xingxinghai Nature Reserve Zones”, combined with special enforcement actions known as “Green Shield” and “Spring Thunder”. These enforcement operations dispatched 700 personnel in 136 intensive patrols to patrol 80,000 km² of park land. Over 6,000 tourists were persuaded to return to more than 2,300 vehicles, thus protecting the grasslands, wetlands, and wild animals inside and outside the park (Sanjiangyuan National Park, 2021).

Although tourism has been prohibited in national parks since the establishment of the pilot project, some high-end eco-tourism activities have been gradually carried out since June 2020 (Sanjiangyuan National Park, 2021). In ecologically important but fragile areas, namely the upper reaches of the Yangtze, Yellow and Mekong Rivers, the government is trying to find ways to diversify and develop local economies to reduce residents' dependence on livestock grazing and *Cordyceps* collection. Both the public and private sectors recognize that the rich cultural and natural assets, namely the extraordinary mountain and grassland landscape, the unique local pastoral culture and the rich biodiversity of the region provide great potential for the development of tourism in the region. With appropriate policies, large economic benefits could be brought to the community; however, without appropriate policies, there could be serious leakage in the tourism industry, with most of the social and economic benefits flowing to external entrepreneurs and enterprises. As many communities around the world have experienced, the potential of ecotourism is unique in its ability to harmonize environmental protection and community development (Li and Han, 2001), yet a cautious approach should be taken by ecotourism practitioners, government agencies and community groups to strengthen the eco-tourism strategy of all protected areas and other nature reserves in the country (Linetti, 2019).

According to our experience and observations over the past 4 years, and elsewhere in the literature (Foggin, 2018), we conclude:

- (1) Like other sectors, communities that participate in eco-tourism decision-making tend to show greater sense of corporate ownership, so they tend to participate more, resulting in deeper development impact and greater project success (also see [Ting et al., 2021](#)).
- (2) Strengthening civil society is important for long-term success, including capacity building, leadership development and promoting the establishment of professional and activity-based networks for encouragement, acceptance and peer-to-peer learning. It has been found in many instances that this approach can increase the sense of hope among local residents, leading to more people participating in the development of new options. Hope is a powerful force that can combine human, natural, economic and political realities to lead sustainable development solutions ([Lybbert and Wydick, 2018](#)).

5.4 Coordination of environmental protection and development

The complex and context-specific relationship between the livelihoods of residents in the national park and natural protection pose many challenges for national park management. Although a long-term interdisciplinary approach may be required to fully understand the relationship between people and the environment in a particular national park, the reality is that most management decisions are made by protected area staff without undertaking such in-depth studies ([Wang et al., 2012](#)). One potential entry point for management to understand the relationship between people and parks and to improve their management is to work from the perspective of local people's perceptions and understanding of the particular park ([Ma et al., 2020](#)).

The Sanjiangyuan National Park includes some towns and villages in addition to vast rural areas. However it is difficult to obtain national administrative permission for planning water, electricity, roads and other civil engineering projects.

Furthermore, the Sanjiangyuan region has had indigenous inhabitants since ancient times, and these Indigenous peoples and local communities (IPLCs) are themselves an important part of the integrated socioecological ecosystem; protection of nature without people is unrealistic. Only when local people's well-being is also considered can environmental protection be most effective. Human development and ecological protection are the core issues in the construction of the Sanjiangyuan National Park, even though most difficult to solve. Indeed, conflict, compatibility, or complementarity between the demands created by livelihood activities and conservation objectives have been the focal point of much discussion over the last two decades. There has been considerable debate as to the effectiveness of Integrated Conservation and Development Projects that, as the name implies, seek to link conservation and livelihood objectives ([Ma et al., 2020](#)). Promisingly, though, human development needs and environmental carrying capacity could be assessed through a co-management approach that respects local herders' abilities to

establish appropriate limits for local ecological contexts and protection requirements of different parts of the National Park area ([Wang et al., 2021b](#)).

5.5 Human-wildlife conflict

The number of snow leopards (*Panthera uncia*) in China dropped sharply in the 1980s due to poaching. In recent years, with the increased attention given to ecological and social protection, the number of snow leopards has stabilized and the estimated number of snow leopards across the entire Sanjiangyuan area now exceeds 1,000 individuals. The area is now recognized in academic literature as excellent habitat with one of the densest populations of snow leopards in the world ([Yan, 2017](#)) and the population of wild animals of all sorts in the Sanjiangyuan area has increased significantly ([Liu et al., 2016](#)). The adverse consequence of this, though, is that conflicts between humans and animals have intensified. Wild animal injuries occur frequently and the safety of the lives, livestock and property of local herders are threatened. One remedial action is the provision of wildlife damage compensation funds with provincial, prefectural, and county-level finances respectively responsible for reimbursing 50%, 25%, and 25% of herders' losses. In reality, though, the total funds available for compensation are limited and the compensation standard for injuries and losses is still too low. Only provincial and county financial compensation have been implemented, while state-level and prefectural compensation have not. It is recommended to speed up the establishment of a sound compensation mechanism for losses due to conflicts with wild animals, so that the herders can receive due compensation for participating in ecological protection and enjoy more benefits brought by the construction of ecological civilization ([Palminteri, 2016](#); [Tamrat et al., 2020](#)).

6 Conclusions

Critical policy analysis was used to assess the Sanjiangyuan National Park in China's Qinghai Province, a massive area of national and global importance for watershed, biodiversity and cultural conservation. A critical review of policy documents and the scholarly literature clarifies the recent history and practice of integrated environmental management and community development in the area, culminating now in the "one household, one post" co-management system. Thousands of local women and men are involved as community wardens, helping to monitor and protect the health of the alpine ecosystem. Implementation of this system has massive implications for the ecosystems and for the well-being of the many local communities that are situated within and near the National Park.

Focus group discussions with 12 groups of residents and local government officials – who vary by gender, occupation, river basin and location inside or outside of the park boundaries – unearthed many positive and negative issues that are felt by local residents and local officials. One of the most salient of these issues is perceived unfairness to people who live outside but adjacent to the park, who bear many of the costs but few of the benefits associated with the national park. Another salient issue is the limited capacity of the

community wardens to effectively perform their monitoring, conservation, and community liaison roles. Eco-tourism, public services such as waste management and health care, and compensation for wildlife damage are also noted as important issues. Addressing these, and tapping into the indigenous ecological knowledge of herders, will be important for the continued development and success of this co-management model.

Overall, our results indicate that the benefits and challenges of this large social and ecological transformation project are unevenly distributed, with distinct impacts on those who live in the national park, those who live near the national park, and those who live downstream of the park. The results indicate that the national park is simultaneously generating meaningful improvements for the natural environment and for local people's livelihoods and socioeconomic development, but it is also found that the model could be adjusted and improved to further benefit residents inside and outside the park through fair and equitable transformations.

Data availability statement

The original contributions presented in the study are included in the article/**Supplementary Material**. Further inquiries can be directed to the corresponding author.

Author contributions

Conceptualization, TM and BS; Data curation, TM; Formal analysis, TM, JMF, and BS; Funding acquisition, WS; Investigation, TM; Methodology, TM and BS; Project administration, TM; Supervision, WS, BS and LZ; Validation, BS and JMF; Writing—original draft, TM; Writing—review & editing, TM, BS, and JMF. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcosc.2023.903788/full#supplementary-material>

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