



## Does Indigenous tourism contribute to Indigenous resilience to disasters? A case study on Taiwan's highlands

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### ABSTRACT

Climate change poses a real threat to Taiwan's Indigenous communities. Many disaster risk reduction or post-disaster reconstruction interventions are implemented in a top down way. The central question of this study is: to what extent does Indigenous tourism build the Indigenous resilience of Taiwan's Indigenous communities after Typhoon Morakot? The research was conducted using a mixed methods approach among three Indigenous Tsou communities. All three communities were severely impacted by typhoon Morakot in 2009. Involvement in Indigenous tourism contributed to better post-disaster recovery and resilience, but discrepancies between the communities and even among households within the communities were observed.

### 1. Introduction

Generally, global climate change is expected to manifest itself in two ways. On the one hand, climate change will increase rapid onset hazards, such as tropical storms, floods and cyclones. On the other hand, it will exacerbate slow onset hazards, such as drought, sea level rise, and changes in rainfall regimes and temperature [1]. Rural Indigenous and local communities face many uncertainties and challenges in the age of global climate change, and are vulnerable to climate-related risks and extreme events [2]. Various studies assert that Indigenous and local communities need to be involved as partners in modern disaster management and conservation efforts [3,4]. This to combat the negative effects of global climate change, but also to maintain local ecosystem services which make a community more (climate) resilient [5]. Additionally, post-disaster reconstruction efforts need to be culturally appropriate taking traditional ecological knowledge (TEK) systems, local institutions, cultures, social systems, and historical injustices sufficiently into account [3,6,7]. There is growing evidence that local communities are left even more vulnerable due to government-led, top-down and technical approaches to post-disaster reconstruction [8–10]. In some cases, governments could decide to resettle entire communities to new places, causing new arenas of conflict and tension and hence new social vulnerabilities [11].

The abovementioned themes will be investigated in the context of Taiwan. In terms of vulnerability to combined hazard risk of typhoons,

floods, earthquakes and landslides, Taiwan is consistently ranked as one of the most vulnerable countries in the world [12]. Taiwan's Indigenous peoples, accounting for 573,086 people in 2020, are especially prone to negative climate-related disasters [13,14]. These communities are seriously affected by typhoons, landslides, heavy rains, droughts and other climate-related events [7,15]. Taiwan's Indigenous communities often rely on agriculture, mining, factory jobs, remittances, forestry or tourism activities for maintaining their livelihoods [14]. Further, ecotourism and other forms of community-based tourism (e.g. Indigenous tourism) have been perceived as ideal mechanism to achieve long-term sustainability of protected areas through conservation, while simultaneously improving local communities' livelihoods and resilience [10,16–18].

The relationship between Indigenous tourism and communities' resilience to both climate-related risks and extremes, and possible climate displacement remains contested [19]. Are communities and households engaging in Indigenous tourism activities more resilient to climate change than others? Do they furthermore face less social vulnerability and have more bargaining power in dealing with government-led post-disaster reconstruction or disaster risk reduction (DRR) initiatives? The main objective of this study is thus to explore to what extent Indigenous tourism builds the Indigenous resilience to climate-related disasters of Taiwan's Indigenous communities. This is investigated at both household and community level, and special attention is paid to inter- and intra-community discrepancies.

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This study focusses on three rural Indigenous Tsou communities in southern Alishan township in Taiwan's highlands and their post-disaster recovery efforts after typhoon Morakot, which struck Taiwan in 2009. Studies on disaster governance and intervention in Taiwan have shown that top-down and technocratic government-led approaches have often increased the vulnerability of Indigenous and local communities. This has for example been the case during post-disaster reconstruction after Morakot [7,8,11]. This makes Taiwan—hosting various Indigenous tourism initiatives—an excellent case study to explore the interdependencies between Indigenous tourism, Indigenous resilience and post-disaster recovery.

## 2. Theoretical framework

### 2.1. Indigenous resilience and resilience capacities

Indigenous resilience is defined as: “*the ways in which cultural factors such as knowledge and learning, along with the broader political ecology, determine how local and Indigenous peoples understand, deal with and adapt to environmental change*” ([20], p. 1). Indigenous and local households and communities have various capacities to cope with or adapt to environmental change. Here, I adopt the resilience capacities approach, which divides resilience into three types: absorptive, adaptive, and transformative capacities [21–23]. There is an increasing interest among studies on disaster resilience [24–27] to investigate how resilience capacities at community and household level can be enhanced through improvements and investments in available capitals or assets. These resilience capacities are defined as “*normative qualities that require the mustering of considerable efforts and resources towards achievement and/or enhancement*” ([25], p. 2). In other words, households and communities must employ and invest in different types of capital to deal with (climate-related) hazards and risk [28].

When it concerns absorptive capacity, households and communities use their financial capital (having enough income) and natural capital (access to natural resources). This to maintain the original structure of their income, consumption, assets and capabilities [24,29]. Cutter et al. [24] refer to absorptive capacity in terms of preventing certain thresholds to exceed so that a livelihood can maintain its function, identity and structure.

When households and communities improve their livelihood systems, which enables them to bounce back from climate shocks and prepare for future shocks, they have a higher adaptive capacity. In order to strengthen their adaptive capacity, households and communities could use or invest in their financial (savings), social (social networks and institutions), physical (ecosystem services and fixed assets), natural (improved irrigation and improved soil quality) and human capitals (knowledge and skills) [25,30,31].

Lastly, a higher transformative capacity refers to fundamental change [32,33]. Households and communities are sometimes able to fundamentally change their livelihood systems and structure of their income, consumptions, assets and capabilities. This enables them to move beyond the vulnerability thresholds [28]. To obtain a higher transformative capacity, households and communities also employ their financial, social, physical, natural and human capitals. For example, investing in human capital enables them to learn a completely new skill to adopt a new livelihood opportunity and accumulating more social capital allows households and communities to widen their networks (e.g. in the tourism industry) [22,29].

### 2.2. Indigenous tourism and building resilience

Indigenous tourism comes in various shapes and forms (e.g. ecotourism, sustainable tourism, community-based tourism, ethnic tourism, agrotourism, etc.) but is defined in this study as a “[...] *tourism activity in which Indigenous people are directly involved either through control and/or by having their culture serve as the essence of the attraction*” ([34], p. 9; [18]). Whitford and Ruhanen [35] argue that sustainable Indigenous tourism should increase Indigenous engagement, empowerment, involvement, reciprocity and control. Ultimately it revolves around the question as to what Indigenous peoples really want and expect from tourism. This is important

as the effects of unsustainable Indigenous tourism are commodification and degradation of Indigenous cultures, environments, and livelihoods and social structures [18,35,36]. Following this definition, this study defines sustainable Indigenous tourism as a sub-set of community-based tourism (CBT). CBT is centred on “*community involvement in the planning and operation of tourism businesses such that the local benefit from development is optimised*” ([37], pp. 1–2; [38]). Here, I refer to CBT and Indigenous tourism interchangeably, as most studies employ the former rather than latter concept.

In this study, sustainable Indigenous tourism or CBT is perceived as a way for communities to build local capacity, facilitate self-organization and diversify livelihoods, or in short, strengthen their Indigenous resilience capacities [10,39–41]. Various studies [39,40,42] assert that social capital, cultural revitalization, collective action and self-organization are important to build resilience in the face of the risks of changes in climate. Case studies [10,17,39,40] have successfully shown that CBT could improve aforementioned factors.

There is a need to improve the capacity of local communities as “[*key*] *vulnerable groups are often excluded from making decisions on the public management of climate-related risks*” ([42], p. 388). Many Indigenous peoples belong to those key vulnerable groups. Worldwide, Indigenous peoples are often marginalized and excluded in decision making on climate change adaptation, disaster risk reduction or post-disaster reconstruction [43,44]. There is, however, growing evidence that Indigenous peoples, through TEK and learning systems, are able to adapt to and cope with climate change [2,3,20,45]. The question is whether engaging in Indigenous tourism could have a similar positive effect [41]. This is a gap that this study aims to address.

### 2.3. Indigenous tourism and disasters in Taiwan

Various studies on DRR and post-disaster recovery, Indigenous tourism, and/or Indigenous resilience have already been conducted in the context of Taiwan [10,41]. One strand of literature deals with disaster governance and resilience. Many studies reflect on the effects of post-disaster reconstruction after typhoon Morakot [7–9]. Many authors agree that post-disaster reconstruction initiatives in Taiwan have disadvantaged and marginalized Taiwan's Indigenous communities [11,46]. The Taiwan government tends to adopt a technical approach to risk, while it largely excludes social and cultural dimensions of vulnerability and sustainability [8]. Furthermore, these studies recognize the following components of effective disaster governance: community participation and identification; local knowledge and socio-cultural capital; and equitable distribution of resources to different communities [8,47].

Another strand of literature concerns community-based conservation and tourism in Taiwan [4,17,48,49]. Tang and Tang's [4] study deals with two case studies on Indigenous tourism in Taiwan. Their study argues that traditional institutional rules, values and beliefs matter in Indigenous tourism schemes. One successful example is Smangus village (Jianshi Township, Hsinchu County) in which villagers managed to develop an effective Indigenous tourism model which was culturally appropriate and benefited community livelihoods. Lin and Polsky [14] further assert that livelihood capitals are key to mitigate climate vulnerability, whereas external policy and historical contexts are important aggravating factors in the context of Taiwan.

This study investigates the level of absorptive, adaptive and transformative capacity of households engaged in Indigenous tourism activities, and the level of adaptive and transformative capacity on community level. This is studied in the context of (social) vulnerability of local households and communities to climate-related hazard and risk, and government responses and policy interventions (e.g. post-disaster reconstruction). Climate displacement and the establishment of ‘ecovillages’ are considered two types of transformative responses. Whether the former or latter strengthens the resilience of Indigenous communities depends on the ecological and socio-cultural context. In some cases, climate displacement is the only option left for local communities [50], and in other cases the established of

**Table 1**  
Evaluating the contribution of Indigenous tourism to resilience capacities.

| Resilience capacities:  | Parameters/Benchmarks:   | How could Indigenous tourism/CBT contribute?  |
|-------------------------|--|---|
| Absorptive capacity     | Coping strategies which households or communities employ to moderate or buffer the impacts of stresses or shocks on their livelihoods [24,52]. | Households that were involved in tourism prior to the disaster employ their tourism-based livelihood strategies to moderate or buffer the disaster. This can be done through making incremental adjustments to their current livelihoods and capitals base.   |
| Adaptive capacity       | The capacity of households and communities within a socio-ecological system to influence resilience [30,31].                                   | Households adopt new livelihood strategies in response to the disaster or as a form of post-disaster recovery. This could result in adopting tourism-based livelihoods strategies, mostly in addition to their existing livelihood strategies. Social capital and learning play an important role in this.  |
| Transformative capacity | The capacity of households and communities to transform themselves and their socio-ecological systems in a deliberate and conscious way [33]   | At household level, transformative capacity could be completely abandoning previous livelihood strategies due to the stress or shock and adopt tourism-based livelihood strategies instead. Therefore, the entire capitals base is consequently restructured. It could also refer to out-migration or moving to relocated villages.<br><br>At community level, it refers to changing the entire village into an 'eco-village' or the relocation of the entire village to a new locality, in which tourism is employed to develop a new village economy. |

'ecovillages' could lead to the 'degradation' or commodification of Indigenous cultures and landscapes [4,10,51].

Table 1 links the resilience capacities approach to Indigenous tourism or CBT initiatives. While the resilience capacities approach is widely used in the disaster resilience literature (see: [25]), relatively few studies in the field of tourism have explicitly adopted this approach [53,54]. While Table 1 is far from exhaustive, it presents the qualitative benchmarks (or parameters) used for evaluating the resilience capacities at community and household level in current study.

**3. Methods and research context**

**3.1. Research context**

Contrary to similar studies in the context of Taiwan (e.g. [10,41]), this study adopts both inter- and intra-community perspectives. The study was

conducted in three communities/villages (*bùluò* in Chinese) in Alishan, Chiayi County, Taiwan: Shanmei, Xinmei, and Chashan (Fig. 1, Table 2). All three communities consist of Indigenous Tsou (or Cou) people. The Tsou, consisting of 6709 individuals in 2020, have traditionally practiced hunting, shifting cultivation, fishing and gathering. Tsou cosmology is based on *kuba-hosa-hupa*, which tibusungu 'e vayayana [55] describes as "the means of Cou knowledge production, praxis and reservoir, and it includes rituals, norms, methods, skills, and institutions of Cou socio-political life" (p.45). The Tsou have developed customary systems related to social structure, beliefs surrounding various deities, TEK, and territory governance based on tribes, clans, and extended families (see also [55] for an extensive analysis). While members of the Tsou community have adopted Christianity since the late 19th century as well as market-based livelihoods, Tsou traditional cosmologies and livelihoods, such as hunting, continue to play important roles for Tsou social and community life [17,55].

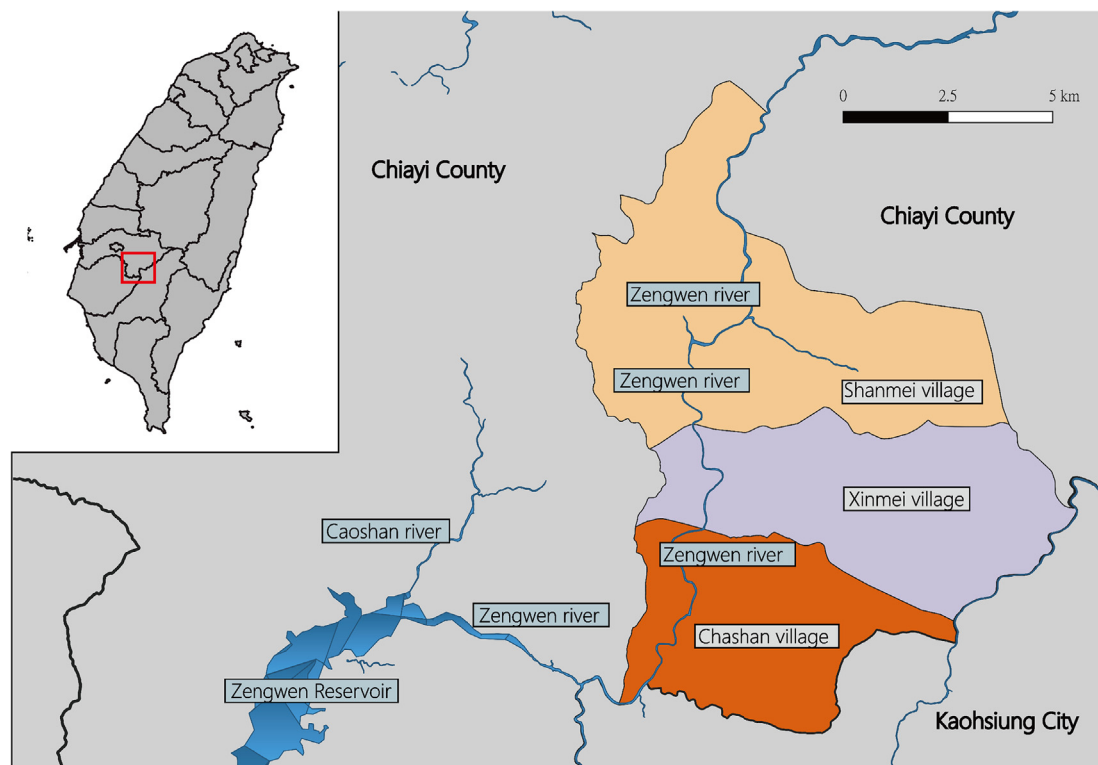


Fig. 1. Study area (own source).

**Table 2**  
Research context.

|  | Shanmei (Saviki)   |             | Xinmei (Sinvi)   |                      | Chashan (Cayamavana)   |                                    |
|--|--|-------------|--|----------------------|--|------------------------------------|
| Population size in 2018 and ethnic composition | 610 (186 hhs)  | Mostly Tsou | 353 (114 hhs)  | Tsou: 98%<br>Han: 2% | 301 (120 hhs)  | Tsou:50%<br>Bunun: 15%<br>Han: 35% |
| Farming products/practices                     | <ul style="list-style-type: none"> <li>- High-mountain tea</li> <li>- Camelia</li> <li>- Persimmon</li> <li>- Ginger</li> <li>- Corn</li> <li>- Jelly fig</li> <li>- Taro</li> </ul>   |             | <ul style="list-style-type: none"> <li>- Ginger</li> <li>- Taro</li> <li>- Jelly fig</li> <li>- Camelia</li> <li>- Forestry</li> </ul>   |                      | <ul style="list-style-type: none"> <li>- Betel nut</li> <li>- Taro</li> <li>- Coffee</li> <li>- Bamboo</li> <li>- Forestry</li> </ul>  |                                    |
| Tourism (seasonality)                          | Every day of the week / year-round   |             | Mostly weekends / Not in the hot summer  |                      | Mostly weekends / year-round   |                                    |
| Tourism activities/resources                   | <ul style="list-style-type: none"> <li>- Danaiku Nature Ecological Park</li> <li>- River fish</li> <li>- Culture show</li> <li>- Traditional food</li> <li>- Visit hunters' house</li> <li>- Homestays (two in total)</li> </ul> |             | <ul style="list-style-type: none"> <li>- Community tour</li> <li>- Hunter experience activities</li> <li>- Concert</li> <li>- Hunting trail experience</li> <li>- Farming experience</li> <li>- Indigenous cuisine</li> <li>- Camping</li> </ul> |                      | <ul style="list-style-type: none"> <li>- Community tour</li> <li>- Cultural experiences</li> <li>- Special cuisine</li> <li>- Archery experience</li> <li>- "Obtaining fire from the heavens"</li> <li>- Water play</li> <li>- Tsou home cooked meals</li> <li>- Homestays (9–12)</li> </ul> |                                    |
| Tourism involvement and challenges             | Great dependence on the tourism sector. Around 90% of the households is directly or indirectly involved in tourism.  |             | Village is located in the middle of the other two tourism spots and is trying to find its own unique selling point. Very few households are involved in tourism  |                      | Keep being attractive and try to not lose momentum. Around 30–40% of the households are involved in tourism.   |                                    |

Table 2 summarizes the research context of the three study sites. Shanmei (or *Saviki* in Tsou language) is a village famous for its establishment of Danaiku Nature Ecological Park (DNEP) and riverside tourism, which has been a bottom-up community initiative since 1989 to protect local fish fauna (*Onychostoma alticorpus*) and stimulate CBT. Shanmei was chosen for this study as it is often hailed as a successful example of CBT in Taiwan as well as worldwide [17,41]. At the same time, Shanmei, as well as surrounding villages, have been severely affected by Morakot and subsequent post-disaster recovery activities [10]. This led to the question: what was the role of Indigenous tourism in post-disaster recovery among local Tsou households? For research comparison purposes, two other neighbouring villages among the Zengwen river were selected (Fig. 1): Chashan (*Cayamavana*) and Xinmei (*Sinvi*). Chashan is a homestay destination, primarily focussing on tourism activities within the village. Xinmei's largest challenge, on the other hand, is that it is sandwiched between the two tourism villages, and has yet to find its own tourism niche.

### 3.2. Methods and data analysis

This study employed a mixed-methods approach (cf. [14]). We conducted a household survey ( $n = 58$ ), semi-structured interviews with community leaders, storeowners, government officials, experts, local people, and tourist operators ( $n = 15$ ), desk research, and engaged in participant observation through repeated visits in the months of May till June, and December 2019. In the household survey we asked for factual information and posed household statements using a 5 points Likert scale (1 = strongly disagree to 5 = strongly agree). The time frame presented to the respondents was for the past ten years (2009–2019). We employed a snowball and convenience sampling method due to several practical constraints: many households are formally registered in their village, but actually living elsewhere, which made it hard to employ random or stratified sampling methods. We approached respondents during church gatherings, we obtained permission from the DNEP committee board to approach all of its employees (all being community members), and local village leaders assisted us in finding additional respondents. While the survey sample was not randomly chosen, which is a limitation of this study, we interviewed 11.3%, 15.0%, and 16.7% of the total household population of Shanmei ( $n = 21$ ), Chashan ( $n = 18$ ), and Xinmei ( $n = 19$ ) respectively.

Data analysis of this study mainly involved a qualitative and thematic analysis approach, in which the three resilience capacities were used as analytical framework (Table 1) to evaluate the influence of Indigenous

tourism on post-disaster recovery since typhoon Morakot in 2009 at both household and community level. Additionally, descriptive statistics and ANOVA tests (using Microsoft Excel and SPSS) were used to further substantiate the qualitative findings of this study.

## 4. Results and discussion

### 4.1. Indigenous tourism and community involvement

The Alishan National Scenic Area (ANSA)—a governmental organization—was responsible for national tourism promotion of Alishan, including the three research villages. Tourism activities in the three villages took very different forms (Table 2). First of all, the main attraction in Shanmei (and South Alishan) is DNEP, which is located a few kilometres away from the village. DNEP, owned by some families in Shanmei, provided livelihood opportunities to almost 90% of the community members. The park offered fish sighting activities, a cultural hall hosting daily shows, and various shops and eateries, which were all owned and run by members of the community. As a bottom-up initiative to protect their local fish fauna, villagers claimed ownership and felt a strong attachment to DNEP (cf. [17]). The daily entrance fees to the park were between 80 and 100 NTD (2.6–3.2 USD), and tour groups primarily visited the park on weekends. At the time of research, DNEP was a popular tourist site for both domestic and mainland Chinese tourists. Between 200,000 to 300,000 tourists visited DNEP every year [56], making it a highly financially lucrative CBT model.

Secondly, tourism in Chashan primarily revolved around homestays and cultural activities within or in close proximity to the village. CBT was formally introduced in 2000 by its former village head, who successfully acquired governmental funding to develop tourism in her community. Chashan consisted of 9–12 homestays—with a capacity of 300–400 beds—and tourists were participating in various nature-based and cultural activities. Tourists were often provided a complete tourism package, priced between 1250 and 2000 NTD (45–73 USD) per person a day. Every weekend, Chashan's youngsters returned from Chiayi city to engage in cultural dancing shows, and villagers maintained a local network of providing services to tourists.

Lastly, the tourism industry in Xinmei was least developed among the researched villages. Several activities within Xinmei were advertised in tourism brochures of the ANSA, such as camping, experiencing hunting culture, and hiking, but the village did not have any homestays. Being sandwiched between Shanmei, which is well connected to Chiayi city,



and Chashan, which is well connected to Dapu (a local town), Xinmei was often overlooked by tourists. A Xinmei store owner proclaimed: "On weekends at least 50 tours busses pass through Xinmei, but no bus stops here!" (26/5/2019).

Indigenous tourism initiatives in Shanmei have been very much an outcome of Indigenous cultural factors, which include knowledge and learning, but also TEK and resource management systems which have protected the local fish fauna and river ecosystem in a bottom-up manner (cf. [20]). Tourism initiatives in Chashan and Xinmei also built upon the unique Indigenous cultures of the communities, but were less connected to other components of Indigenous Tsou culture such as aforementioned TEK and resource management systems.

Development associations (DAs) played a key role in all three villages in tourism development, post-disaster recovery, and other socio-economic affairs. The DAs are non-profit civil organizations at village level to manage government funded projects and programmes [57]. Thus, the DAs were responsible for the acquisition of government funding through proposal writing and acted as a connecting agency between local villagers and various governmental agencies. All three DAs were established in the late 1990s, and local villagers were able to join this association by paying a yearly membership fee of 600–1200 NTD (22–44 USD). In Shanmei, on the other hand, the local DA was funded by DNEP, and did not depend on individual membership fees. All villagers in Shanmei aged 20 and above automatically acquired membership. The direct involvement of DAs in tourism varied: in Chashan and Shanmei the DAs played a central role in tourism development, whereas in Xinmei the DA was only partly or superficially involved.

#### 4.2. Impacts of typhoon Morakot

Typhoon Morakot, which struck Taiwan in August 2009, has had a significant impact on all three research communities. The destructive effects of the typhoon led to 699 deceased, 1766 destroyed homes and 4500 displaced residents nationwide [11]. According to official statistics, 95 houses in Alishan were destroyed or severely damaged due to landslides, mudslides, and flooding, which included 15, 1 and 0 houses in Shanmei, Chashan and Xinmei respectively [58]. Alishan's tourism industry suffered around \$1 billion NTD (36,131,740 USD) in losses [59]. The amount of visitors to DNEP dropped to 0 in 2010 and it took 6 years to return to the same visitor level of 2008 (around 110,000 annual visitors) [56]. The typhoon furthermore destroyed agricultural fields, (river) ecosystems, roads and other built infrastructure. It took 10 months to repair the only highway leading to Alishan, which was heavily damaged by Morakot [59].

Table 3 highlights the respondents' subjective assessment of the impact of Morakot on their household livelihoods. Agricultural losses were reported by most respondents, and its impact has been evaluated by the respondents as quite severe. Most households also reported a loss of income because of Morakot, and more than half of the respondents in Chashan and Shanmei reported housing damage. The estimated financial loss among the respondents varied highly, but it ranged between 20,000 NTD (722 USD) to 1,000,000 NTD (36,118 USD).

At the community level, various types of damage were reported because of Morakot, including damage to roads, most (suspension) bridges, agricultural fields, forests, streambeds, and other essential infrastructure (cf. [59]). Before 2009, Xinmei's tourism was renowned for its hiking trails along the

river, but they were wiped out by Morakot, and still not restored at the time of research. Xinmei's former village head stated: "people do not come to Xinmei anymore because our selling point got destroyed. Xinmei was known for its beautiful hiking trails along the river" (26/5/2019). Local ecosystems surrounding all three villages faced moderate to severe damage due to Morakot. Shanmei's village head asserted: "the natural environment changed a lot and we are trying to get the river back to normal. Money cannot fix this!" (2/6/2019). Thus, it suffices to note that the tourism industries of all three villages were negatively impacted by Morakot.

#### 4.3. Resilience capacities at household level

While the impacts of Morakot were severe for the three villages, fortunately no one got severely injured or killed by the typhoon. Regarding in-season coping strategies, households stated that their respective villages had a container filled with food and medicine that was used during and in the direct aftermath of Morakot. Answering Likert scale statements on intra-community support, respondents generally agreed that they helped and were helped by community members during and after typhoon Morakot: households in Shanmei and Chashan generally expressed a strong agreement (scores ranging between 4.1 and 4.5), whereas households in Xinmei were more divided with scores ranging between 3.3 and 3.5 (Statements 1–4 in Table 4). All three communities furthermore opined that they received sufficient information from the government on how to cope with typhoons, albeit in moderate agreement (Statement 5). Whereas the residents of Shanmei and Chashan also moderately agreed with the statement that the rebuilding of their community was done in an acceptable amount of time, Xinmei residents generally disagreed with this statement (Statement 6).

Post-disaster recovery efforts were generally implemented in a top-down manner. At the household level, the findings of this study show that participating in tourism played a salient, albeit diverse, role in post-disaster recovery among the households of the three villages. Households in Shanmei (4.40) and Chashan (4.28) proclaimed that tourism became more important in the community after Morakot (Statement 7), which was in stark contrast with households in Xinmei stating more or less the opposite (2.94). In Chashan, six households operated a homestay before Morakot. Within a few months after the typhoon struck the community, three homestays ceased to exist, of which one was directly a consequence of Morakot. At the same time, nine other homestays have been developed since then. In Shanmei, it took nearly two years to rebuild the park. In the meantime, individuals were offered 100 NTD (3.2 USD) a day to volunteer in rebuilding and cleaning up the park. The DNEP, furthermore, received substantial governmental and donor support for its recovery. The Shanmei DA played a pivotal role in acquiring and mobilizing these funds. The hiking trails of Xinmei, their main tourism attraction, were not restored yet at the time of research. While new tourism initiatives were being proposed, such as providing 'real' homestays in people's homes, the Xinmei DA failed to mobilize both funds and community members in developing a new CBT model.

Generally speaking, households agreed that young people were important in bringing new ideas for the tourism industry in the community (Statement 8), though attracting young people to return to the village proved to be a challenge. In Shanmei and Chashan, young people only returned to the village from the city during weekends in order to engage in Indigenous

**Table 3**  
Subjective assessment of the negative impact of Morakot at the household level.

| Dimension:          | Xinmei  |                    | Shanmei |  | Chashan |  |
|---------------------|---------|--------------------|---------|--|---------|--|
|                     | Yes (%) | Overall evaluation | Yes (%) | Overall evaluation                                 | Yes (%) | Overall evaluation                                 |
| House structure     | 31.6    | Not severe         | 61.9    | Mixed: half severe/very severe and half not severe | 61.1    | Mostly not severe                                  |
| Personal belongings | 26.3    | Moderate severity  | 47.6    | Mixed: half severe/very severe and half not severe | 50.0    | Mixed: half severe/very severe and half not severe |
| Work equipment      | 36.8    | Mixed answers      | 52.4    | Majority severe                                    | 38.9    | Mixed answers                                      |
| Agricultural losses | 52.6    | Mixed answers      | 71.4    | Majority very severe and severe                    | 72.2    | Majority very severe or severe                     |
| Loss of income      | 47.4    | Quite severe       | 61.9    | Majority severe and very severe                    | 88.9    | Majority very severe or severe                     |

**Table 4**  
Household statements on post-disaster recovery, tourism and resilience capacities.

| Statements  | Xinmei |       | Shanmei |       | Chashan |       | Total |       | ANOVA<br>(one-way)* |
|---|--------|-------|---------|-------|---------|-------|-------|-------|---------------------|
|   | Mean   | SD    | Mean    | SD    | Mean    | SD    | Mean  | SD    | p-value             |
| 1. I helped my community members <b>during</b> typhoon Morakot  | 3.35   | 1.320 | 4.38    | 0.590 | 4.06    | 1.124 | 3.96  | 1.098 | <b>0.012</b>        |
| 2. I was helped by my community members <b>during</b> typhoon Morakot   | 3.41   | 1.228 | 4.29    | 0.644 | 4.53    | 0.514 | 4.09  | 0.948 | <b>0.001</b>        |
| 3. I helped community members <b>after</b> typhoon Morakot  | 3.41   | 1.278 | 4.52    | 0.602 | 4.33    | 0.767 | 4.13  | 1.010 | <b>0.001</b>        |
| 4. I was helped by my community members <b>after</b> typhoon Morakot  | 3.53   | 1.328 | 4.33    | 0.577 | 4.17    | 1.098 | 4.04  | 1.061 | 0.052               |
| 5. My household received information from the government how to deal with typhoons                                | 3.71   | 1.213 | 3.85    | 0.875 | 3.94    | 0.802 | 3.84  | 0.958 | 0.767               |
| 6. The rebuilding of the community after typhoon Morakot was done in an acceptable amount of time                 | 2.78   | 1.215 | 3.80    | 1.005 | 3.11    | 1.231 | 3.25  | 1.210 | <b>0.025</b>        |
| 7. After typhoon Morakot, tourism became more important in the community  | 2.94   | 1.349 | 4.40    | 0.821 | 4.28    | 0.826 | 3.89  | 1.201 | <b>0.000</b>        |
| 8. The youth is bringing in new ideas for the tourism industry in the community                                   | 3.76   | 1.251 | 4.48    | 0.512 | 4.61    | 0.698 | 4.30  | 0.913 | <b>0.010</b>        |
| 9. We needed government funding to fully recover from typhoon Morakot   | 3.63   | 1.258 | 4.15    | 0.875 | 4.33    | 0.970 | 4.06  | 1.054 | 0.129               |
| 10. I know how to apply for funding for developing tourism  | 2.43   | 1.342 | 3.93    | 1.163 | 3.36    | 1.447 | 3.26  | 1.432 | <b>0.014</b>        |
| 11. I know how to apply for funding to recover from a typhoon/disaster  | 3.00   | 1.464 | 4.08    | 0.760 | 4.07    | 0.997 | 3.69  | 1.220 | <b>0.020</b>        |
| 12. My household had plans to participate in the tourism industry because of typhoon Morakot                      | 2.38   | 1.310 | 2.87    | 1.457 | 3.56    | 1.504 | 2.96  | 1.485 | 0.063               |
| 13. My household feels more capable to cope with the impacts of a typhoon because of the development association. | 3.41   | 1.326 | 4.42    | 0.507 | 3.00    | 1.495 | 3.63  | 1.307 | <b>0.002</b>        |
| 14. I would like to be a part of the development association  | 3.12   | 1.453 | 4.17    | 0.857 | 4.50    | 0.985 | 3.94  | 1.247 | <b>0.002</b>        |
| 15. I have participated in government meetings on development/planning issues on my community                     | 3.29   | 1.490 | 4.06    | 0.854 | 4.39    | 1.037 | 3.92  | 1.230 | <b>0.024</b>        |
| 16. The community benefits from the tourism industry  | 2.83   | 1.200 | 4.19    | 0.750 | 4.11    | 0.676 | 3.74  | 1.078 | <b>0.000</b>        |
| 17. My household benefits from the tourism industry   | 2.67   | 1.372 | 3.40    | 1.046 | 3.78    | 1.263 | 3.29  | 1.289 | <b>0.028</b>        |

\* Note: Bold stands for statistically significant  $p < 0.05$ .

tourism activities. Xinmei, an aging community, on the other hand, failed to attract its youngsters to return. A primary school teacher in Xinmei, aged 24, stated: “besides me there is only one other person of my age in this community”(25/6/2019).

Different from Xinmei, applying for governmental funding was one of the main coping strategies for the respondents in Shanmei and Chashan to recover from typhoon Morakot as well as building up or maintaining their livelihoods (Statement 9). Households generally applied for funding and subsidies through or from the DA, Township Office, Council of Indigenous Peoples, Agricultural Council, Ministry of Labor, and the Red Cross. The DA usually played an intermediary role in bringing funds and subsidies to the people. The funding was primarily used to recover from typhoon damage as well as agricultural and tourism development, and amounts varied greatly: ranging between 2000 TWD (73 USD) to 300,000 TWD (10,888 USD). In Xinmei, respondents had less access to these types of funding (see Statements 10–11), as they were either unaware of these opportunities and their DA played a less effective role in its bridging function. More strikingly, Xinmei also received less governmental priority in post-disaster reconstruction as shown in section 4.4.

Applying for funding strengthened households' absorptive and adaptive capacities, the former corresponding to using government funding to operate or intensify tourism businesses and services, whereas the latter being used in setting up tourism businesses (mainly in the form of homestays, see also: Statements 9–11). While households in Chashan generally agreed with the statement that they participated in the tourism industry because of typhoon Morakot (Statements 12), their counterparts in Xinmei and Shanmei generally disagreed with this statement, with the former struggling to establish a tourism industry and the latter already having had a well-developed tourism industry prior to the typhoon. Households in Chashan were also more involved in tourism marketing after typhoon Morakot. A cultural dancer in Chashan elucidated this as follows: “After the typhoon, we have had much more tourism development. Before the typhoon there was not much tourism marketing going on, but now marketing our village to outsiders really pays off! (1/6/2019).

Many households realized the need to diversify their livelihoods, as they recognized that solely engaging in tourism made them more vulnerable to future shocks. Households in Chashan, for example, started engaging in coffee farming, and Xinmei farmers became more involved in organic agriculture, both being examples of strengthening households' adaptive capacities. During in-depth interviews, some informants proclaimed that diversifying livelihoods, such as the shift to coffee farming, would reduce the disaster risk of their households. Though most households employed multiple livelihood strategies (Table 5), there were fears that an overreliance on

government assistance could reduce the households' resilience capacities. For instance, one homestay owner in Chashan, proclaimed: “people got lazy after the typhoon, because they can get a lot of funding easily now. People became less interested in helping each other” (1/6/2019). Table 5 also shows that most respondents in Shanmei engaged less in agriculture than the other two study sites, and thus mostly relied on tourism-based activities, which could make them more vulnerable to external shocks and stresses on the longer run.

Engaging in Indigenous tourism did not substantially affect the transformative capacities of the households: both Chashan and Shanmei already had an existing tourism industry prior to Morakot, and Xinmei's tourism industry has not been fully recovered yet. Further, survey results indicate that only a few households abandoned certain (agricultural) livelihood strategies as a direct consequence of typhoon Morakot in favour of tourism-based livelihoods.

In terms of transformative change, two important developments deserve further investigation. First of all, some households of the three villages were resettled to Zhulu, a relocated community in neighbouring Fanlu Township, within a few years after Morakot struck. Households were designated by the government to be residing in danger or non-danger areas. Being in a danger area would allow households to move into free permanent housing in a relocated community, such as Zhulu, but failing to do so would automatically exclude the household from applying for governmental funding. A study of Lin and Lin [10] already focussed on the role of tourism on the resilience of resettled households in Zhulu, and they concluded that tourism had a positive effect. Preliminary findings indicate that the resilience capacities of households, living in danger areas, who chose *not* to relocate, on the other hand, were negatively affected by government policy. These households had fewer opportunities to invest

**Table 5**  
Multiple livelihoods strategies of the households (multiple answers possible, %).

| Livelihoods strategy                      | Xinmei | Shanmei | Chashan |
|---|--------|---------|---------|
| Agriculture (rice)                        | 5.3    | 0.0     | 5.5     |
| Agriculture (organic)                     | 10.5   | 19.0    | 50.0    |
| Agriculture (non-organic)                 | 42.1   | 9.5     | 33.3    |
| Livestock                                 | 31.6   | 9.5     | 27.7    |
| Homestay owner                            | 5.3    | 0.0     | 27.7    |
| Homestay employee                         | 5.3    | 19.0    | 33.3    |
| Restaurant owner                          | 5.3    | 4.8     | 27.7    |
| Restaurant employee                       | 0.0    | 42.9    | 27.7    |
| Guide                                     | 5.3    | 14.3    | 44.4    |
| Culture host (Dancer, story teller, etc.) | 26.3   | 57.1    | 16.6    |
| Other:                                    | 0.0    | 9.5     | 5.5     |

or engage in tourism-based livelihoods due government imposed sanctions which blocks their access to funding. More researched is needed to understand how these government policies influence the resilience capacities of these households.

Secondly, as stated above, all three villages faced relatively high out-migration rates. It is not clear to what extent out-migration, as a transformative change, contributes to shaping households' resilience capacities, both for the migrants and those 'left behind'. The ways of how typhoon Morakot influenced (voluntary) out-migration patterns in the study sites as well as beyond also warrant further investigation (cf. [11]).

4.4. Resilience capacities at community level, and inter- and intra-community discrepancies

In the direct aftermath of Morakot, the Taiwanese government set up the Special Act for the Post-Disaster Reconstruction of Typhoon Morakot in order to centralize and manage post-disaster reconstruction efforts. Various governmental and non-governmental organizations were involved through this Act. The primary objective of the government was to promptly relocate affected households to free permanent housing in relocated communities (such as Zhulu), preferably within the same village or township. Various scholars [7,9–11] assert that this approach has contributed to cultural conflicts and livelihood problems among relocated communities. CBT (or Indigenous tourism) has been identified by the government as a means to achieve cultural revitalization and to mitigate social tensions among different relocated tribe members [10,41].

The Taiwanese government often prioritized tourism communities first in post-disaster reconstruction efforts as tourism has been identified as a key component of community rehabilitation. While not as important as the Alishan National Forest Recreation Area, DNEP is designated as a national 'scenic spot' in Taiwan [56]. As a consequence, Shanmei, and later Chashan, received more government support than Xinmei as Shanmei hosts DNEP, and Chashan was already an 'ecovillage'. Elucidating this, a national-level government official proclaimed: "the government first helped the famous Danaiku park, and then Chashan, and later Xinmei, because tourism had to return as soon as possible. The tourism communities have first priority"(13/7/2019). On the other hand, it could also be argued that Xinmei experienced less damage than the two other villages, and therefore received less priority. Nonetheless, governmental interest in tourism development among Indigenous

communities surged after Morakot. This was one of the main reasons why households in Shanmei and Chashan generally had better access to government funding and subsidies, which were very often utilized for CBT development, than their counterparts in Xinmei. Hence, the government's priority to develop tourism communities first did not only increase the adaptive capacities of Shanmei and Chashan at community level, but also directly led to inter-community inequalities in post-disaster reconstruction efforts.

Shanmei became a national 'model' CBT village, and other Indigenous villages/communities were expected, often implicitly, to either adopt a similar model or find their own CBT niche (see [41]). Shanmei's village head stated that Indigenous communities from all over Taiwan have visited their village in order to develop their own tourism industry. The Shanmei DA therefore had good vertical linkages with other (non-)governmental agencies and played a key role in the post-disaster recovery of the village. Horizontal relationships between the DAs of the three villages, on the other hand, were rather weak. The Xinmei DA, for instance, reported very little cooperation with the other DAs. Additionally, the CBT model in Chashan was not based on Shanmei, but its former village head obtained funding and knowledge directly from the government as well as through international cooperation.

Besides inter-community differences, intra-community differences also existed. Communities are not homogenous, and the heterogeneities and (potential) disputes among 'members' of a community need to be acknowledged [37,51]. The concept of Indigenous 'community' is, for example, very contested in Taiwan [60]: even in this study village and community are used interchangeably. While it is beyond the scope of the study to present the heterogeneities of the three communities in greater detail, the relationship between the DAs and members of the community profoundly shaped the latter's resilience capacities. The DAs are very much gatekeepers of information and funding sources. Information asymmetries were observed between members and non-members of the DAs. Those involved in the DA were often able to receive funding, and thus had more capabilities to increase their resilience to disasters. There was also a positive relationship between people already engaging in tourism and one's ability to have access to funding. For instance, findings from the in-depth interviews showed that households in Chashan who were engaged in tourism (around 30–40%) had better access to funding than other households. This was because households involved in tourism were directly cooperating with the DA—being closely involved with CBT planning and activities within the village—and thus more aware of funding procedures and possibilities. In Xinmei,

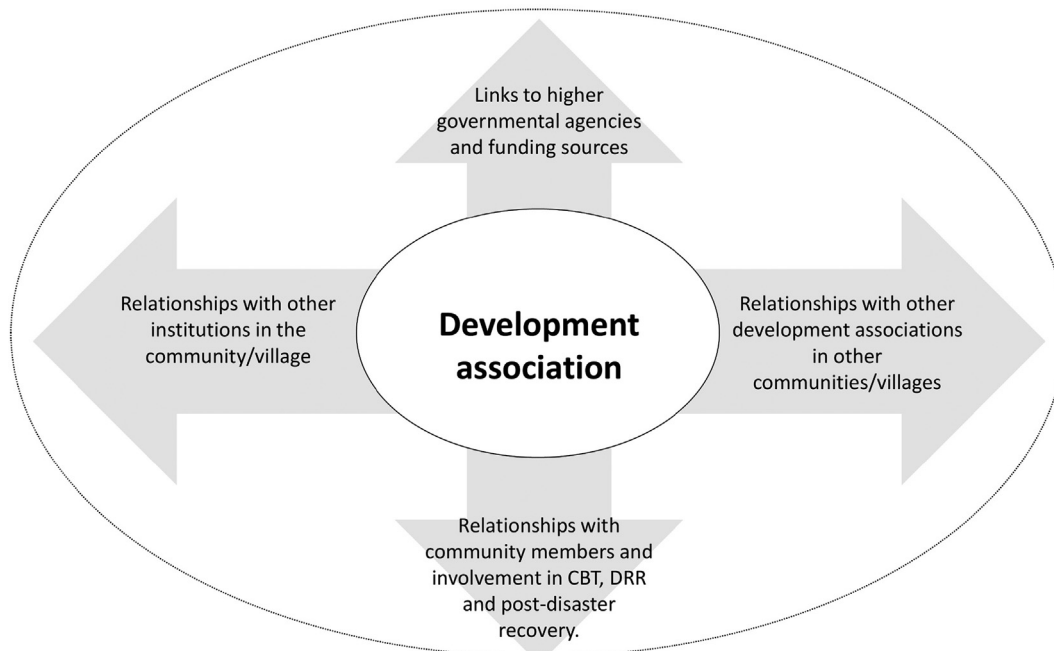


Fig. 2. Relationships of the DA at community level.



only 36.8% of the respondents were members of the DA as opposed to 72.2% in Chashan. Xinmei's DA had a somewhat troublesome relationship with the community members it seemed to represent, which further explained the lack of information Xinmei villagers had on governmental funding and subsidies.

Table 4 shows that the DA of Shanmei had a positive influence on the perceptions of how households coped with the impacts of typhoons, such as Morakot (Statement 13). Shanmei households also generally wanted to be a part of the DA (Statement 14), which further resulted in active household participation in government meetings on development/planning issues (Statement 15). Households in Xinmei agreed less with these statements, which further highlights their troublesome relationship with the DA. Households in Chashan were only divided on the statement whether their DA helped them cope with typhoons (Statement 13), which also largely corroborates with the observed information asymmetries among members and non-members.

Within each village, several institutions also competed for power. The various churches, the DAs, other community associations (such as Leisure and Agriculture Association, Organic Agriculture Development Association, etc.) and NGOs both collaborated but also competed with each other. Traditionally, post-disaster recovery efforts at the community level were conducted by the churches, but the government gradually took over this responsibility. Further, traditional institutions (cf. [55]), being a key component of Indigenous resilience, were present in all three villages, but were largely left out in Indigenous tourism and post-disaster recovery initiatives.

Even in Shanmei, a 'model' CBT village, intra-community discrepancies were observed. While the respondents in Shanmei generally agreed with the statement that the community benefits from the tourism industry (Statement 16), they agreed less with the statement that their household benefits from it (Statement 17). This was most likely related to the fact that many community members occupied jobs in the DNEP with low upward mobility, such as dancers, waiters or story tellers (57.1% of Shanmei's respondents; Table 5). DNEP was only owned by some families in Shanmei, and thus the tourism benefits were not necessarily shared in an equitable manner. Reflecting upon the role of tourism in his village, an ex-police officer in Shanmei illustrated it as follows: *"although it is difficult to live here, because of the proneness of the area towards disasters, people stay here because of the tourism industry. If there would be no tourism industry people would have left after the typhoon"* (19/6/2019).

Fig. 2 is a visual summary of the role of the DAs in Indigenous tourism and post-disaster recovery among the three villages. As the DAs, supposedly representing the entire community, play a pivotal role in both tourism and post-disaster reconstruction, its bridging and bonding relationships [61] constitute important dimensions of analysis to understand how Indigenous tourism shapes Indigenous resilience capacities at both household and community level.

### 5. Conclusion and future outlook

In this study, I argue that the primary role of Indigenous tourism in DRR and post-disaster recovery of Indigenous peoples in Taiwan is enabling access to governmental funding and subsidies for tourism or other livelihood goals, as summarized in Table 6. While a positive relationship between Indigenous tourism and Indigenous resilience was found, discrepancies between the villages and even among households within the villages were observed. Thus, inter- and intra-community discrepancies need to be considered when discussing the concept of Indigenous resilience and resilience capacities. Various forms of bridging and bonding relationships influence Indigenous resilience at household and community level (cf. [61]). Putting priority on tourism communities has been a political decision in Taiwan (i.e., the broader political ecology). The 'winners' and 'losers' which arise from this, however, need to be further investigated as the results of this study have shown. In terms of transformative change, there should be more opportunities for Indigenous peoples than either moving to a relocated community or transforming their respective communities into ecovillages. Additionally, traditional Tsou institutions could take over

**Table 6**  
Interdependencies between Indigenous tourism, Indigenous resilience and post-disaster recovery.

| Dimensions   | Xinmei   | Shanmei   | Chashan  |
|--|--|---|--|
| Type of Indigenous tourism   | Tourism industry was not well established and the main attractions have been wiped out by typhoon Morakot. While building upon some cultural components (such as hunting schools), tourism in Xinmei did not fit the definition of Indigenous tourism.   | Well established tourism industry, and a form of Indigenous tourism, due to the incorporation of cultural components and being a direct outcome of local TEK and resource management systems.   | Well established tourism industry, and partially a form of Indigenous tourism. Tourism in Chashan mainly focussed on homestay's and cultural shows.  |
| Contribution of Indigenous tourism to resilience capacities and post disaster recovery | Absorptive: Local tourism industry was not recovered yet from typhoon Morakot. Thus, Indigenous tourism played a limited role.<br>Adaptive: Households rather focussed on organic agriculture instead of tourism activities. The community was not well organized due to their troublesome relationship with the DA. Aging was also a big problem for the community.<br>Transformative: No clear evidence.   | Absorptive: Households could rely upon their tourism-based livelihoods to recover from Morakot, but this largely took the form of applying for funding through the DA or other government institutions.<br>Adaptive: Engagement in Indigenous tourism also contributed to higher adaptive capacity, but many households faced relatively low upward mobility, and livelihood diversification strategies were limited in Shanmei. At community level, Indigenous tourism already existed prior to Morakot.<br>Transformative: No clear evidence. | Absorptive: Households could rely upon their tourism-based livelihoods to recover from Morakot, but this largely took the form of applying for funding through the DA or other government institutions.<br>Adaptive: Indigenous tourism became more important after Morakot at both household and community level, and clearly contributed to higher adaptive capacity. However, members of DAs had more access to information on government funding than non-members.<br>Transformative: No clear evidence. |
| Challenges to Indigenous (climate) resilience  | Inequality: Inter- and intra-community discrepancies in all three study sites were observed.<br>Broader political ecology: Communities involved in tourism received more government assistance in post-disaster recovery than communities not involved in tourism.<br>Exclusion of traditional institutions: Traditional institutions and local churches were largely excluded from Indigenous tourism and post-disaster recovery activities. The DAs played a pivotal role instead, which played a key role in bridging and bonding relationships.<br>Coping and adapting to climatic change: TEK and resource management systems in Shanmei played a direct role in Indigenous tourism as well as Indigenous resilience. This was less the case for the two other study sites. |   |  |



some responsibilities of the DAs. Each village in Alishan traditionally represents a Tsou tribe or clan, and therefore horizontal relationships between these institutions were already well established [55].

COVID-19 has exposed how vulnerable the tourism industry really is [54]. While it presents new opportunities for Indigenous tourism and CBT (see [62]), it also shows the importance for Indigenous and local households to diversify their livelihoods in order to increase their resilience capacities to cope with or adapt to disasters, ranging from typhoons to global pandemics. This study has furthermore shown why the socio-cultural dimensions of post-disaster recovery—as outlined in the Sendai Framework—matter. While it is not clear whether or not typhoon Morakot is a consequence of global climate change, Indigenous and local communities, both in Taiwan and beyond, will most likely experience very similar, if not worse, disasters in the near future. Comprehending and investigating how they build their Indigenous resilience, possibly through tourism, is therefore imperative.

#### Data availability

The data are available from the corresponding author upon reasonable request.

#### Credit author statement

Mucahid Mustafa Bayrak is the primary researcher and solely responsible for conceptualizing, researching, analysing and writing the manuscript.

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#### Declaration of Competing Interest

None.

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