# ASSESSING THE CURRENT SITUATION OF ICH IN ASSOCIATION WITH NATURAL DISASTERS: CASE STUDIES

# AN ICH-DISASTERS DIALOGUE ON GAUA ISLAND, VANUATU

Meredith L. Wilson[1] and Yoko Nojima[2]

This document reports on a survey conducted by the International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI) on the island of Gaua, Republic of Vanuatu, in July 2017. The survey was conducted as part of a broader IRCI project on the safeguarding of intangible cultural heritage (ICH) and disaster risk management (DRM) in the Asia-Pacific region. The objective of the survey was to seek community perspectives on the interrelationship between intangible cultural heritage and disasters. Two workshops were held on Gaua, at Namasari and Ontar villages, which established a preliminary inventory of ICH practiced or performed on Gaua and identified the major natural hazards that have impacted the island over time. Workshop sessions were devoted to identifying ICH that has played a role in mitigating the impacts of certain natural hazards, and to establishing how natural hazards have impacted ICH directly and indirectly. Discussions also considered the mechanisms involved in the transmission of ICH, the processes that have affected its transmission over time, and measures for its long-term viability and safeguarding.

As well as generating information for the IRCI project, the workshops provided a forum for the community to identify and reflect on its ICH; to consider what role ICH plays in improving disaster outcomes; and to review safeguarding measures for the protection of the island's ICH into the future. The project generated reports in the local pidgin (Bislama) that have been returned to the community for their own cultural heritage and disaster planning purposes. This report concludes with a series of recommendations for the development of a fully-fledged project on Gaua that would work towards developing a safeguarding plan for Gaua's ICH in the context of natural disasters.

## THE PROJECT

### Project Background and Goals

In 2016, IRCI launched one of its signature projects: 'Preliminary Research on ICH Safeguarding and Disaster Risk Management in the Asia-Pacific Region'. The project constitutes a key component of IRCI's Medium-Term work program (2016–2020) which includes conducting research on ICH in countries within the Asia-Pacific region that are endangered by disasters.

1 Stepwise Heritage and Tourism Pty Ltd, Australia
2 International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI), Japan

In late January 2017, IRCI hosted an International Working Group Session at the Tokyo National Museum, inviting speakers from Asia-Pacific countries. The working group collectively considered how ICH is mobilized and safeguarded in different disaster scenarios and discussed some of the practical and policy challenges associated with building local disaster knowledge into DRR/DRM planning in the Asia-Pacific region. The session also highlighted the need for more detailed first-hand accounts from the communities that use, transmit, and safeguard ICH to comprehensively understand the factors (cultural and environmental) and processes that affect the viability of ICH within and between disaster cycles. Such information was deemed essential for developing effective strategies for integrating ICH within future DRR/DRM planning. Phase two of the IRCI project therefore involved a series of field surveys and interviews amongst community-based ICH practitioners, performers, and audiences.

In consultation with the Director of the Vanuatu Cultural Centre, Mr Richard Shing, who participated in the Tokyo meeting, the island of Gaua in the Banks Islands (Torba Province) was nominated as the focus for a community survey in Vanuatu. Several factors precipitated this decision:

1. The Banks Islands are relatively isolated geographically and thus traditional knowledge and practices remain important for disaster risk reduction.

2. There are active volcanoes on Vanua Lava and Gaua and thus the survey may be able to identify local strategies to deal with eruptions.

3. The community has been subjected to severe disasters in the recent past and should therefore be able to draw on their own memories and experiences. Mt Garet on Gaua, one of the most active volcanoes in Vanuatu, erupted on 18 November 2009, provoking mass evacuation to the east side of the island.

4. Lake Letas (Mt Garet's crater lake) is registered on UNESCO's Tentative List for World Heritage in Vanuatu. The survey output may therefore support the eventual development of a DRM plan for the site and the Vanuatu Cultural Centre's ongoing efforts to record the cultural values of the area, including those related to ICH elements.

The specific goals of the field survey on Gaua were to:

1. identify local ICH related to natural disasters;

2. identify the impact of natural disasters on local ICH;

3. identify the positive aspects of local ICH, such as how it contributes to community resilience in disaster contexts;

4. understand the community's needs and priorities for developing action plans for ICH safeguarding in disaster situations and the possible integration of ICH in the future DRM/DRR planning.

## Location and Description of the Study Area

Vanuatu is an archipelago located in central Melanesia, composed of more than 80 islands. Most of the islands are volcanic in origin, with several active volcanoes distributed throughout the archipelago. Located in the region where the Indo-Australian plate is submerged under the Pacific plate, Vanuatu experiences frequent seismic events that commonly include earthquakes of magnitude 5 to 6 (Caminade et al., 2000).

The Banks Islands, along with the Torres Islands, comprise the northernmost province (Torba) of Vanuatu (Figure 1). While many islands in the central and northern part of the archipelago are located close to one another, the Banks Islands lie at some distance from this island chain. The Banks Islands consist of six major islands, Gaua being the largest (342 $km^2$), followed by Vanua Lava (314 $km^2$). Both islands have active volcanoes at their core: Suretamatai on Vanua Lava, and Mt Garet on Gaua. Mt Garet contains Lake Letas, the largest lake in Vanuatu stretching some 9 km north to south. Currently on Vanuatu's Tentative List of properties intended for World Heritage nomination, the lake has been the focus of multiple conservation efforts including a protected area management project, the establishment of a National GeoPark and preparatory work for the Ramsar Wetland site (Willie, 2016).

The population of Banks Islands is concentrated on the islands of Vanua Lava (estimated population of 3,110), Gaua (2,822), and Motalava (1,676) (SPC, 2015). The provincial office of Torba Province is situated in Sola, Vanua Lava. Several different languages are spoken on the island of Gaua: Nume (estimated number of speakers 700) in the north, Lakon (800) and Olrat (3) in the west, Koro (250) and Dorig (300) in the south, and Mwerlap (1,100, with the majority of speakers on Merelava and Merig) in the east (Francois, 2012). The

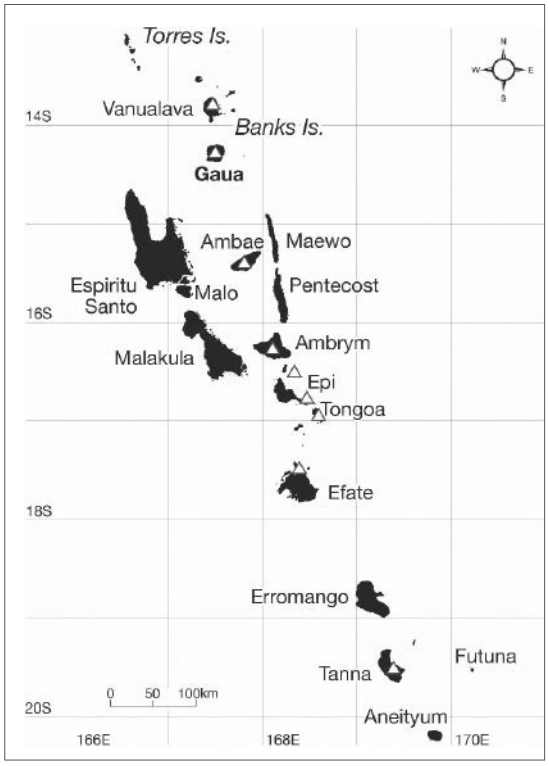


**Figure 1**
Map of Vanuatu
(△indicates the location of active volcano)

eastern side of the island was recently settled by people from other islands, most notably the small neighbouring island of Merelava.

## Project Approach

### *Workshop planning*

Planning for the workshops was undertaken in collaboration with the Vanuatu Cultural Centre, and in consultation with Vila-based personnel currently working on the the *Forest and Protected Area Management Project* (FPAM) on Gaua. The workshops included representation from all sectors of the community (leaders, men, women and youth), as well as local specialists in the heritage (ICH) and disaster fields. The principal disaster contacts on Gaua include the Provincial Area Secretary and members of the Community Disaster Committees (CDCs). The authorities on traditional knowledge include the '*Lan* Council' which is made up of *kastom* chiefs from around the island; the '*Vatsur* Council', which consists of *kastom* and elected chiefs from the three Area Councils; and the Area Councils, including Gou (east Gaua), Lokon (west Gaua), and Tavaliu (south Gaua). The project also benefited from the involvement and *kastom* knowledge of Mr John Star (Dolav village), a former Vanuatu Cultural Centre fieldworker, and ICH knowledge holders, practitioners and performances.

### *Defining the project for the Gaua community*

While the Gaua community was already familiar with disaster planning involving foreign agencies, the IRCI project was its first introduction to the concept of ICH. The first two sessions of each workshop were therefore devoted to providing clear definitions of ICH, and multiple examples of how ICH and disasters intersect (see Sessions 1 and 2 in Table 1).

In the wake of the Category 5 Cyclone Pam, which struck the Vanuatu archipelago in March 2015, the Vanuatu government and local NGOs have worked extensively with communities on DRM planning.[3] Some of this planning has focused on mobilizing and strengthening existing local strategies relating to food security, architecture, and environmental management that are used to mitigate the effects of disasters. Such strategies are commonly referred to in the disaster literature as 'local knowledge', 'indigenous knowledge', 'traditional knowledge' or 'traditional ecological knowledge' (Shaw et al., 2008; Nakashima, 2010).

The Convention for the Safeguarding of the Intangible Cultural Heritage of 2003 defines intangible cultural heritage (ICH) in an open-ended manner as 'the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognise as part of their cultural heritage'.[4] These elements are manifested in the following five domains 'i) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage; ii) performing arts; iii) social practices, rituals and festive events; iv) knowledge and practices concerning nature and the universe; v) traditional craftsmanship'.[5]

3 See for instance projects listed on the Government of Vanuatu's National Advisory Board on Climate Change and Disaster Risk Reduction: http://www.nab.vu/projects

4 UNESCO 2016, Section 2.1.

5 UNESCO 2016, Section 2.2.

On the advice of the Vanuatu Cultural Centre, the Bislama expression *kastom save* was adopted on Gaua to describe 'intangible cultural heritage'. The workshop facilitators defined *kastom save* as including 'local knowledge' (as defined by disaster experts), as well as a broader range of ICH performances and practices.

## Workshop Schedule

A workshop outline and a series of accompanying survey forms were developed that could be used to achieve the project objectives (Table 1 and 2).

**Table 1** Sessions and topics discussed during the Gaua workshops

**Session 1: Opening remarks**

- About IRCI and ICH
- Why ICH for DRR/DRM?
- Objectives and goals of the activity

**Session 2: Background information (disasters and ICH on Gaua)**

- Natural disasters/DRR/DRM (triggered by natural hazards)
- Heritage (including ICH)

**Session 3: Identifying hazards**

- Varieties of hazards (types, severity, frequency)
  - i. Meteorological
  - ii. Hydrological
  - iii. Geological/geomorphological
  - iv. Biological
  - v. Triggered by Climate Change
- History of natural hazards on Gaua

**Session 4: Identifying local ICH associated with natural hazards ('kastom save blong disasta')**

**Session 5: Inventory of ICH; and impacts of disasters on ICH**

**Table 2** List of workshop forms

**Session 3 form: Wanem kaen hazard** (Natural hazard/disaster identification and issues)

**Session 4 form: Kastom save blong disasta** (ICH that plays a role in DRR/DRM)

**Session 5 form: Rekod blong kastom save mo hao disasta i afektem hem** (ICH inventory and disaster impact information)

**Disaster scenario form: Sipos wan disasta i hapen**

**ICH practitioner form: Man o woman blong kastom save**

The first workshop, held at Namasari village on 20 July 2017, was attended by 28 residents, 26 of whom reside in Namasari.[6] The workshop focused on topics covered in

6 Two participants live in the neighbouring villages of Vatles and Lembot.

Sessions 3 and 4, including the identification of the natural hazards that affect the region, and the documentation of ICH that plays a role in mitigating the impacts of disaster (such as famine foods, disaster-resistant building techniques, post-disaster ceremonies).

The second workshop, held at Ontar village on 22 July 2017, was attended by 24 people from the villages of Ontar, Manqaqal, Dolav, Qetegaveg and Bushman's Bay. Focusing on the topics covered in Session 5, participants worked on generating an inventory of ICH on Gaua, and then exploring particular ICH elements in detail, including analyzing the ways in which they have been impacted by natural hazards and other factors over time.

## SURVEY WORKSHOPS

### History of Disasters and Disaster Management on Gaua

The Banks Islands have experienced several severe hazard events in recent history, including cyclones, earthquakes and volcanic eruptions.

Several tropical cyclones and storms have been recorded as having passed through or near the Banks Islands within the past century (Table 3).

**Table 3** Cyclones that have passed through or near the Banks Islands

| Date | Name of Cyclone (if known) |
|---|---|
| February 1941 | — |
| February 1954 | — |
| January 1955 | — |
| February 1972 | Wendy |
| March-April 1975 | Betty |
| January 1979 | Gordon |
| February 1980 | Rae |
| January 1988 | Anne |
| November 1991 | Tia |
| February 1992 | Daman |
| April 1992 | Innes |
| December 2002 | Zoe |
| January 2008 | Funa |
| January 2011 | Yasi |
| March 2014 | Lusi |

(Source: Vanuatu Meteorological Service, 1994)

Some cyclones have been more destructive than others, but none have involved reports of fatalities; Cyclone Wendy, in 1972, completely destroyed the meteorological station in Sola; Cyclone Gordon, in 1979, resulted in severe damage throughout the Banks; Cyclone Anne, in 1988, devastated the neighbouring Torres Islands and parts of the Banks; Cyclone Tia, in 1991, damaged crops and houses, and there was an incident involving a man injured by corrugated iron; and Cyclone Daman in 1992 damaged crops and gardens. During Cyclone Zoe (2002) and Cyclone Funa (2008) there were reported cases of coastal flooding caused

by storm surges (World Meteorological Organization, 2009; RSMC Nadi, n.d.). During Cyclone Yasi (2011), most garden crops and fruit trees were destroyed in the Banks Islands and many houses were damaged in the Torres Islands (OCHA, 2011).

Cyclone Pam, which devastated Vanuatu including its capital Port Vila in March 2015, inflicted minimal damage in the Banks Islands. In May 2017, about two months before our visit to Gaua, Cyclone Donna caused significant impact in the Torres Islands but resulted in minimal damage in the Banks Islands.

Magnitude 7+ earthquakes struck Vanuatu in March and August 2007, the latter damaging a bridge in Luganville, the urban centre on Santo. There were also two 7.6- and 7.7-magnitude earthquakes in October 2009, which were felt in both northern Vanuatu and the Solomon Islands and caused low grade of tsunamis in some areas (NOAA NCEI, n.d.). The Gaua residents who attended the IRCI workshops claim that they were not affected by these events.

Mt Garet has experienced several volcanic eruption events, as summarized in Table 4. Two major eruptions caused the evacuation of locals in 1973 and again in 2009–2010. The 2009–2010 event forced around 250 residents living on the western side of the island to evacuate to the northern and eastern coasts of Gaua for about six months. Rather than being placed in evacuation centres, evacuees were hosted by families living in unaffected parts of the island.

**Table 4** Recent history of the eruptive activities of the Mt Garet volcano

| Year | Eruptive activities |
|---|---|
| 1962 | Eruption damaged vegetation on the western slope in July. |
| 1963 | Moderate ash discharge observed in September. A new vent opened on the southeastern side of Mt Garet. Dark grey ash was visible from Vanua Lava. |
| 1965 | Eruption for three days from 27 September. Ash emission reached 6000 m. |
| 1966 | Periodic small ash emissions |
| 1967 | A small ash emission |
| 1968 | Small emissions of ash and steam |
| 1969 | Small emission on 22 September |
| 1971 | Minor ash emissions occurred on 12–13 May. |
| 1973–74 | Major eruption event. Entire population of Gaua was evacuated. |
| 1976 | Moderate eruption |
| 1977 | Moderate eruption caused localized discoloration of Lake Letas. |
| 1981 | Condensed ash release observed |
| 2009–10 | Strongest eruptive activities since 1963. Commencing 29 September 2009, a series of explosions generated ash-laden plumes into the atmosphere. Activity increased in November, with four large eruption events that accompanied ash falls in the northwest of the island. Ash emission increased significantly from 16 January. Activity started to decline in July 2010 and ended in September 2010. Lake Letas went through a partial discoloration on its southern side. |
| 2013 | A small eruption on 30 April. |

(Sources: Bani et al., 2015; Volcano Live, n.d.)

Community Disaster Committees (CDC) have been established in each village and include representation from the village chief. The CDCs fall under the auspices of the Area Council Secretary in Sola, who is responsible for managing disaster situations within the province and maintaining communication with the National Disaster Management Office (NDMO) in Port Vila. The Red Cross has been working with the Gaua communities to establish a disaster management plan for the island.

## Cultural and Natural Heritage Projects on Gaua

The *Lan* and *Vatsur* Councils on Gaua have implemented several *kastom*-based projects, including a recent initiative to document customary land boundaries on the island to circumvent potential land disputes in the future. The community also hosts an annual *Salav* Festival, held on St Andrew's Day, which is both an income-generating activity and an opportunity to transmit and continue traditional crafts and *kastom* performances. Gaua has also established an international reputation for its water-music, a *kastom* practice performed by women that involves the splashing and slapping of ocean and river water to make music (Dick, 2014).

Gaua has recently attracted the attention of government and non-government agencies and researchers interested in Mt Garet, Gaua's active volcanic cone, and the surrounding crater lake, Lake Letas. The Department of Forestry currently manages the *Forest and Protected Area Management Project* (FPAM), an initiative funded by the Global Environment Facility (GEF) with the assistance of the Pacific Alliance for Sustainability (PAS). One of the outcomes of this project has been the establishment of a 'geopark', which encompasses Lake Letas, the crater environment and Siri waterfall. The FPAM project is also working towards the establishment of a Community Conservation Area (CCA) to protect the biodiversity of the geopark, and the eventual recognition of the area as both a Ramsar Wetland Site and a World Heritage site. Lake Letas is already listed on Vanuatu's Tentative List of properties recognised under the 1972 World Heritage Convention.

In 2016, as part of the FPAM project, the Vanuatu Cultural Centre undertook a field survey to document cultural sites within the geopark (Willie, 2016). Eight sites were recorded, including a former *nakamal* (meeting house), old villages, *tabu* (sacred) stones, and several landscape features tied to the creation myths of Lake Letas. While these sites represent a small proportion of the total number of *kastom* places on Gaua, the survey marks an important step towards recording the cultural heritage values of the island.

In preparation for the survey workshops, IRCI researchers consulted existing anthropological and ethnological literature to document traditional and contemporary performances and practices from Gaua and the broader region of the Banks Islands.[7] This information was consulted during the workshops to generate discussions about ICH. A 'picture book' of traditional Gaua material culture was circulated during the two workshops to stimulate discussion.

7 The archival study involved a comprehensive survey of material held in the Vanuatu National Library and Archives as well as a review of more detailed works on the subject, including Codrington, 1891; Kolshus, 1999; and Speiser, 1996.

## **Disasters on Gaua Today** – identifying and prioritizing

Participants at Namasari worked collectively to generate a comprehensive list of the natural hazards that impact Gaua (meteorological, hydrological, geological/geomorphological, and biological), including those triggered or magnified by climate change (Table 5).

Participants were then asked to nominate three hazards that they consider to be most damaging or impactful, either to them personally, or to their family, village or island. 'Climate change' was voted as the most important issue, considered to be the most likely trigger for extensive dry periods on the island. 'Biological issues' received the next highest score due to a perceived proliferation in the numbers of insects and weeds affecting garden crops in recent years. Meteorological disasters (including cyclones) were also regarded as significant but less so than the first two categories.

It was surprising that workshop participants did not prioritise 'geological hazards', particularly given that the 2009–2010 volcanic eruption resulted in the relocation of over 300 people from West Gaua to Namasari village for a period of some 18 months. Perhaps the Namasari villagers felt less impacted by this event because they were not the ones relocating, but considerable pressure was brought to bear on their village as a result of the evacuation event. As well as hosting people in the weeks and months after the evacuation, stretching local resources, the local chiefs were required to assign land to the west coast refugees so that they could construct houses and prepare gardens.

Rather, the Namasari participants voted for those hazards which they deemed to be of immediate concern, and which they felt poorly equipped to address. The impacts of drought on water supplies, and of insects on food resources, are a constant source of stress and hardship because they directly and immediately impact on food supply. In contrast, sporadic events such as cyclones, and volcanic ashfalls and eruptions, cause temporary rather than long-term difficulty, and are therefore not at the forefront of

**Table 5** List of natural hazards that impact Gaua Island

Meteorological
- ☑ Cyclones and storms
- ☑ Fire
- ☑ Drought
- ☑ Extended and more intense hot periods

Hydrological
- ☑ Flood
- ☐ Tidal wave (small ones)

Geological/geomorphological
- ☑ Volcano
- ☑ Earthquake
- ☑ Landslide/landslip
- ☑ Erosion

Biological
- ☑ Human health
  e.g. 'red-ae' (red eye)
- ☑ Insects (increase)
  e.g. fire ants
- ☑ Algae and invasive weeds
  e.g. 'biglif' (an invasive vine)
- ☑ Reef damage
  - caused by cyclones
  - crown of thorns (increase)

Climate Change
- ☑ Sea-level rise
- ☑ Change in weather
  - reduced 'cold' periods

people's minds. The community also draws on its *kastom save* handed down over several generations, to cope with these larger-scale but more infrequent disasters. Gaua has been fortunate to avoid the full force of disasters that have significantly impacted other parts of Vanuatu in recent times, including the category 5 Cyclone Pam (March 2015) which challenged people's coping mechanisms and capacity for self-reliance.

Participants were then divided into breakout groups to examine three hazards (or hazard triggers) of concern in more detail: climate change; biological disasters; and cyclones. On the advice of senior village members, the three groups were separated into senior men (biological disasters), women (cyclones), and youth (climate change). The aim of the session was to consider how these hazards impact communities both environmentally and socially, and to begin to build a picture of how the community manages disasters.

A spokesperson for each group reported back to all workshop participants. The responses highlighted that a degree of physical damage and loss caused by natural hazards is inevitable (e.g. cyclones damaging gardens, reefs, and housing; and drought affecting the size and quality of crop yields), and that as the community recovers from a hazard event, certain local activities are adversely impacted (marriages are postponed, funerary ceremonies are curtailed, economic activity is affected). In rare cases, natural hazards cause direct and complete loss of local knowledge. For instance, cyclones have been known to destroy forest trees that mark customary land boundaries. In cases where the marker trees have not been replanted after a disaster, knowledge of land boundaries has been irretrievably lost. Some groups reported on the 'domino effect' of some hazards. For instance, recent droughts on Gaua have resulted in wild pigs seeking food in community gardens, causing further depletion of a food system already under considerable stress.

However, the groups also reported that there is considerable disaster resilience within the community when traditional disaster mitigation strategies are implemented, such as the planting of disaster-resilient crops prior to the cyclone season. Sometimes resilience is the privilege of certain knowledge holders, such as one family that has retained knowledge concerning the preparation of arrowroot (*ra*), a local famine food, or the local Namasari resident who is said to possess secret knowledge relating to the prevention of an invasive insect. Resilience is thus not evenly distributed across the community.

The groups also remarked on opportunities that arise from disasters. For instance, after one particular cyclone, a program of food security was initiated with the support of a visiting NGO that resulted in the preparation of 'disaster gardens' that are designed to support the community during periods of food shortage. Drought is also regarded as beneficial in some respects. Yams are said to be more productive during dry periods, and 'strong' sun is thought to be responsible for thickening the skin of fruit, making it more resistant to certain insects.

### **ICH on Gaua** – identifying and prioritizing

The participants at Ontar village were introduced to the topic of ICH inventorying through a general description of UNESCO's five ICH domains, exemplified using the information gathered during the desktop study. For ease of discussion, the UNESCO domains were collapsed into three and explored in breakout groups:

a) *Kastom* stories, songs, dances and performance

b) *Kastom* ceremonies

c) *Kastom* knowledge associated with the environment and craftsmanship

The senior chiefs present assigned workshop participants to groups according to their knowledge, rank, and other undisclosed factors. Some of the more elderly participants were described as 'doctors' of specific knowledge, which influenced their placement. Edson Willie (Vanuatu Cultural Centre) was assigned to facilitate the men's group discussing *kastom* ceremony, as this theme is associated with closely guarded men's knowledge.[8]

Each group worked on assembling an inventory of ICH elements for their assigned theme. Participants labelled each element in local language and then briefly described them in Bislama. The exercise amassed over 80 separate ICH elements across the three groups (Figure 2).

The inventorying process provided an opportunity for younger members of the community to work collaboratively with senior knowledge holders. When the language names or details of elements could not be recalled, members of other groups were called upon to assist. At the completion of the inventorying process, a spokesman for each group presented their findings and the audience was given a chance to suggest additional elements.

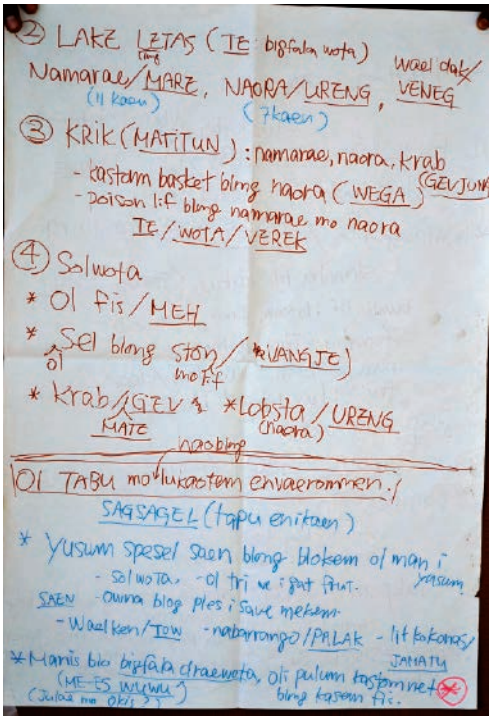


**Figure 2**
Sample of ICH elements listed by a group of participants

8 Unfortunately, this precluded an investigation of traditional women's grade-taking systems and ceremonies.

## **The Role of ICH in Disasters** – preparation, response and recovery

One of the workshop sessions at Namasari village was dedicated to exploring local knowledge used to manage or mitigate the effects of disasters (*kastom save blong disasta*). The session opened with several explanations from the facilitators as to why *kastom save blong disasta* is important to consider in DRR/DRM planning, including:

1. **Sustainability**: the use of *kastom save* involves the use of locally sourced and replaceable materials, which are inexpensive and allow for immediate repair.

2. **Life-saving capabilities**: we have learned from Cyclone Pam and other disaster experiences that *kastom save* can be life-saving.

3. **Culturally constituted**: *kastom save* is embedded within culture and is therefore part of an organic system of disaster response (the importance of which extends beyond disaster response to other aspects of cultural sustainability).

4. **External partnerships**: it is important that external organisations that are supporting local disaster responses are aware of *kastom save* already in place so that introduced ideas can be adapted to local conditions and cultural circumstances.

The positive aspects of using local knowledge were tempered by an acknowledgement that some *kastom save* may benefit from the support of external knowledge or technologies, and that natural disasters are changing in nature (cyclones are becoming more intense) and therefore certain *kastom save* may need to adapt to new circumstances.

The session worked collectively to develop a preliminary list of *kastom save* used during different types of disasters, and during the different phases of the conventional disaster cycle (preparation, response and recovery). Discussions ranged across a variety of topics, including food and water security strategies; building strategies; environmental indicators of impending disasters; places of refuge; fire protection techniques; and leadership and social coordination strategies (Table 6).

Due to time constraints, the session was restricted to the documentation of *kastom save* associated with actions taken during the different phases of the disaster cycle (see Figure 3). However, a complete analysis of *kastom save blong disasta* would consider the full suite of tangible and intangible features embedded within the community and the surrounding environment that support its resilience during a disaster, such as the careful historical location of settlements to reduce their exposure to storm surges (see recommendations at the end of this document).

On the basis of feedback received during this session, two local disaster mitigation strategies were explored in more detail: traditional wooden house structures used to protect people in times of disaster (referred to in Bislama as *nakamal*, and locally as *gamal*); and disaster foods (in Bislama referred to as *kakae blong disasta*).

The workshop closed with a brief consideration of community plans to revive two local knowledge practices that are currently under threat of loss on Gaua: the construction of traditional *nakamal* (a project already being considered by the Lan Council) and the

**Table 6** ICH related to disaster risk reduction / *Kastom save blong disasta*

| | |
|---|---|
| **Cyclone** | |
| Preparation | Plant manioc, coconuts, wild yam, taro, breadfruit, Fiji taro; prepare houses; check for environmental signs: clouds, fruiting patterns; algal blooms |
| Response | Seek refuge together in the strongest houses |
| Recovery | Use disaster foods; drink spring water |
| **Fire** | |
| Preparation | Don't light fires in the dry periods |
| Response | Create fire breaks |
| Recovery | Make gardens in recently-burnt fertile areas |
| **Drought** | |
| Response | Use spring water; cave water; eat sweet potato, which is productive during the drought season |
| **Volcano** | |
| Preparation | Build kastom houses (*nakamal*) that prevent wind (and smoke) from entering; check for environmental signs: it is locally believed that a 'strong sun' indicates an earthquake is imminent. |
| Recovery | Chiefs organise community work to build houses and gardens for refugee families |
| **Earthquake** | |
| Response | Move to *Vat gaga*, a stone located in a local creek which is a safe refuge during an earthquake; remain in the house depending on how the ground is shaking |


**Figure 3**
Bislama representation of the DRM cycle used during the Gaua workshops

harvesting and use of *ra* (arrowroot), formerly used as a disaster food in post-cyclone contexts. *Ra* is a 'famine food' exclusively used in disaster situations. Because it does not play a broader role in society, and is therefore used infrequently, its transmission is more tenuous. The onset of international aid further threatens *ra*, as other more palatable foods are now available during the disaster response phase, when *ra* was traditionally used.

As a longer-term safeguarding measure, one participant suggested either the establishment of a *kastom disasta komiti*, or the installation of a *kastom save* representative within each

of the current Community Disaster Committees, to ensure that local knowledge that plays a role in disaster mitigation is considered in tandem with other DRM strategies.

## The Impact of Disasters on ICH

To explore the impact of disasters on ICH, the Ontar workshop participants were asked to select ICH elements from their group inventories (see 'ICH on Gaua' above). The facilitators provided two criteria to guide the selection: 1) the element should be significant to the group, or to Gaua more broadly; and 2) the element should be threatened, or have been impacted by, natural hazards. With insufficient time for further explanation, participants found it difficult to grasp the second criterion, instead gravitating towards choosing elements that were significant for a multitude of reasons (including personal ones) and that should be recorded for future generations. The facilitators therefore focused on the question of disaster impact during the small group discussions.

The participants selected the following elements:

1. **'Kastom' stories, songs, dances and performance**
   a. *Etmet were Lemana*: a 'kastom' story about devils that formed at a site called Lemana
   b. *Mavto*: a type of dance used in ceremony
   c. *Gamal*: men's meeting house

2. **'Kastom' ceremonies**
   a. *Matmat*: funerary ceremony
   b. *Vasvasuk*: grade-taking ceremony
   c. *Tuntun*: traditional adoptions

3. **'Kastom' knowledge associated with the environment, and craftsmanship**
   a. *Sa*: a net used during low tide
   b. *Gat*: a traditional basket used to carry food
   c. *Puruh*: a traditional light

Each of the ICH elements was explored in detail, and information about loss or damage sustained over time by the element was recorded.[9] The responses of participants suggest that disasters triggered by natural hazards are not the primary cause of ICH loss. Rather, it is the full suite of social, environmental, political, and economic conditions leading up to a disaster that influences how a community responds to and recovers from a disaster event.

Disasters triggered by natural hazards usually cause short-term interruptions to the practice of ICH elements. For instance, the manufacture of a traditional basket (*gat*) by women in west Gaua for carrying crops was suspended temporarily during the volcanic eruption of 2009–10 when the practitioners were forced to relocate to Namasari. During their 18-month period of relocation, the women carried their crops in empty rice sacks. When the practitioners returned to their villages in west Gaua, and their forest resources had regenerated, they resumed the practice of weaving *gat* baskets.

9 The '*kastom* stories' group only had time to discuss *Etmet were Lemana*, which is a complicated story with many intersecting components.

A common statement made during this session was '*mifala i save hao blong mekem, be mifala i nomo mekem'* ('we know how to do it, but we don't do it anymore'). Thus, while the *kastom save* for a large corpus of ICH practices still exists, several of them are no longer practiced. The inventorying exercise was both insightful and confronting for the community as it came to terms with the incremental losses, in memory and practice, of some ICH elements.

When asked why certain ICH elements are no longer practiced, a range of socio-historical and economic explanations were offered, amongst them the adoption of Christianity, the homogenisation of agricultural systems, an increased engagement in global financial markets, and the unwillingness of the younger generation to embrace traditional ideas and practices. The *gamal*, a men's meeting house which was a focal point for numerous *kastom*-based activities, is no longer being constructed. ICH practices on Gaua that depend on the *gamal* are thus significantly threatened. Traditional forms of trade and exchange, which were foundational to the grade-taking systems on Gaua and other ICH practices, have gradually been superseded by activities associated with the modern cash-based economy (Huffman, 2005). As a consequence, forms of ICH associated with traded goods – shells, mats, kava, and pigs – as well as the goods themselves, are threatened. Inter-generational issues are also causing ruptures in the transmission of ICH knowledge. Other ICH is being lost due to a breakdown in inter-generational trust. Some older knowledge holders on Gaua are concerned that if they pass on traditional information to the younger generation it will be misused.

## PROJECT FINDINGS AND THE FUTURE OF ICH SAFEGUARDING ON GAUA

The workshops provided a productive forum for working with the Gaua community to better understand the relationships between disasters triggered by natural hazards and *kastom save* (ICH). In fulfilment of the goals of the Gaua survey, the workshops identified ICH related to natural disasters; identified the impact of natural disasters on ICH; revealed some of the opportunities offered by ICH; and provided some understanding of the needs of the community in terms of longer-term planning for ICH safeguarding during and between disaster cycles.

Two workshop reports, prepared in Bislama, have been completed and sent to the Namasari and Ontar communities. The reports provide a summary of the workshop findings, and information that will allow the community to continue to reflect on the mobilisation and safeguarding of its ICH.

### Findings

Several findings arose from the workshop sessions:

- On Gaua, natural hazards have not been – in and of themselves – a significant cause of ICH loss, but merely interruptions in the historical trajectories of ICH elements. Major disaster consequences – such as permanent relocation of settlements away from traditional sites, or a loss of practitioners – would certainly contribute to ICH loss, but Gaua has not faced such extreme circumstances in living memory. Pre-disaster conditions have in most cases been re-established to enable the continuation of ICH practices.

- Everyday contemporary disasters, such as those triggered by climate change (excessive dry periods, for instance), and the rise in insect infestations in local gardens, are regarded as the most problematic for the Namasari community. Such disasters tend not to be mitigated by *kastom save* as they represent uncharted territory for the community. The vulnerability of the community with respect to these disasters is that they are without precedent, and solutions and adaptations have not yet been found.
- The Namasari community was less concerned by disasters that are infrequent (e.g. volcanic eruptions, cyclones), and for which it has a suite of historically transmitted *kastom save* at its disposal to enhance its disaster resilience.
- Some ICH is directly threatened by disasters, including elements which plays a role in disaster mitigation, such as the famine food (*ra*) which has largely been replaced by international food aid, as well as ICH that doesn't play a role in disaster mitigation, such as forest trees that mark traditional land boundaries and have been destroyed by cyclones. However, most disaster impacts on ICH are temporary. For instance, the manufacture of the *gat* woven basket was suspended during the 2009–2010 relocation to Namasari, and then resumed when communities resettled west Gaua 18 months later.
- Disasters caused by natural hazards are neither the only nor the principal threats to ICH viability on Gaua. ICH elements on Gaua are threatened by a range of factors – environmental, economic, political and social – that manifest over time, within and between disaster events. The *nakamal* on Gaua provides a focal point for the longitudinal degradation of several examples of *kastom save*. Over time, the various functions of the *nakamal* have diminished, as have the local grade-taking ceremonies and other ICH practices associated with the *nakamal*. The rise of Christianity and increasing participation in the cash economy are two amongst several explanations that have been proposed to account for changes to *nakamal* and other ICH on Gaua. With *nakamal* no longer being constructed, their dual function as disaster refuges has also been lost, along with the unique architectural knowledge that protects people from cyclonic winds, volcanic ash, and seismic events.
- A proportion of local *kastom save* is not being enacted or practiced on a regular basis on Gaua, significantly affecting its transmission. It was difficult for participants to recall certain terms and features of local *kastom save* during the workshops, prompting discussion amongst participants about the importance of documentation, revitalisation, and practice.

## The Future of ICH Safeguarding on Gaua

This report proposes the preparation of an ICH safeguarding plan for ICH elements on Gaua that includes the following components:

1. A complete inventory of Gaua's ICH elements that records historical and ongoing threats to their transmission and viability.

2. A complete record of Gaua's *kastom save blong disasta* that includes the full suite of tangible and intangible features embedded within the community and the

surrounding environment that supports its resilience during a disaster.

3. The development of a risk matrix that identifies ICH that is most significant to the community *and* most threatened by disasters and other factors.

4. The development of action plans for minimising risk and enhancing the viability of ICH elements, including the documentation and planning of local projects that encourage the continued practice of ICH that is significant to the community.

5. The establishment of local management policies and practices that encourage the implementation of ICH practices that increase the resilience of Gaua residents in disaster situations, and the protection of ICH more broadly.

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# THE ICH SITUATION DURING THE AFTERMATH OF TROPICAL CYCLONE WINSTON: RESULTS OF THE PRELIMINARY FIELD SURVEY IN RA PROVINCE, FIJI

Tomo Ishimura[1,2], Yoko Nojima[2], Ilaitia Senikuraciri Loloma[3], and Elizabeth F. D. Edwards[4]

## INTRODUCTION

Many Pacific island nations are highly vulnerable to various natural hazards. Notably, over the past few years, tropical cyclones have caused serious damage: Cyclone Pam in March 2015 struck Vanuatu, including its capital Port Vila; Cyclone Winston in February 2016 swept across all the major islands of Fiji; and more recently, in February 2018, Cyclone Gita devastated the islands of Tonga (Government of Fiji, 2016; Government of Vanuatu, 2015; The Guardian 2018). Since the beginning of IRCI's project, 'Preliminary Research on ICH Safeguarding and Disaster Risk Management in the Asia-Pacific Region' in 2016, IRCI has been cooperating with Blue Shield Pasifika (BSP) and the iTaukei Institute of Language and Culture (TILC) to understand the current situation of intangible cultural heritage (ICH) and its vulnerability to devastation and loss during natural disasters in Fiji. Our discussions on Fiji have tended to focus on Tropical Cyclone Winston (TC Winston) because recovery from this devastating event remains an ongoing process.

The post-disaster needs assessment (PDNA) following TC Winston in Fiji included a section on 'Culture and Heritage' (Government of Fiji, 2016), where major recovery needs were estimated for the reconstruction of built heritage, such as the historic port town in Levuka and the rehabilitation of Navala village with its traditional *bure* houses. While this assessment also addresses ICH-related damage to raw materials for craft production, ritual costumes and herbal medicines; totemic plants and trees, and crops and animals that are important for rituals and ceremonies, no further details were offered. Assessing the damage to ICH elements in the short term is not an easy task because ICH is principally invisible and thus is often overlooked during the assessment process. Therefore, by tracing the recovery process following TC Winston, our research tried to obtain a detailed picture of ICH after a disaster.

The goals of the study were to identify the following:

1) Varieties of ICH in areas that are related to natural disasters

1 Department of Intangible Cultural Heritage, Tokyo National Research Institute for Cultural Properties
2 International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI), Japan
3 iTaukei Institute for Language and Culture, Fiji
4 Blue Shield Pasifika, Fiji

2) The impact of natural hazards and disasters on ICH

3) Positive aspects of ICH and understand the mechanisms of community resilience in which ICH has a significant part to play

TILC was also particularly interested in understanding the traditional indigenous knowledge of 'indicators', and to mobilise them to enhance the community's preparedness for disasters. Following discussions with our Fijian counterparts, this preliminary field research was conducted in two communities of Ra Province, one of the areas that were damaged the most by TC Winston. The overall objective of this field research was to assess the situation of ICH in the context of natural disasters at the local community level.

The factors that contributed to the abovementioned decision were as follows:

1) These areas had been subjected to TC Winston as recently as 2016, and the community would be able to draw on their own memories and experiences.

2) These coastal villages have traditional fishing and marine resource management strategies, and the impact of TC Winston on these practices needs to be assessed.

3) An ICH inventory is available for these areas owing to TILC's Cultural Mapping Project. Therefore, the survey confers the following benefits:
   a) The survey enables us to assess the impact of natural disasters on ICH, and this attempt could be elaborated later as a potential model to assess the impact of disasters on ICH.
   b) The survey provides an opportunity to monitor and update the current state of ICH elements recorded by the Cultural Mapping Project.

## SURVEY AREA AND INTERVIEW METHODOLOGY

Interviews were conducted during 26 September and 1 October 2017 in the two villages of Naocobau and Namarai, Ra Province, in northeast Viti Levu. Both villages were severely affected by TC Winston, which devastated the islands of Fiji on 20 February 2016. These villages were recommended to us by the project's Fijian counterpart, BSP, in consultation with Fiji Museum and the Department of Heritage.

Both Naocobau and Namarai villages are located near the coast, to have better access to marine resources. While Namarai is a seaside village, Naocobau is on a hilltop. Both villages were founded from late 19th to early 20th centuries by groups of people whose ancestry derived from previously fortified inland sites.

Naocobau village was founded in 1902 as a new village. Villagers comprised two tribes (*yavusa*) of Dewala and Dalitaulevu. The ancestors of the Dalitaulevu people used to inhabit the interior of the island of Viti Levu, near the area of today's Dama village to which they are related. During the 18th century, they moved to Nacokovaki, which is close to their current village location, to avoid inter-tribal warfare. The Dewala people originated from Draniyacawa, which is located across the cove. Two households still reside in Draniyacawa, which is an exclave of Naocobau. There was a measles outbreak during the 1920s that caused the loss of many villages, and only one family survived. This may have

led to a considerable loss of indigenous knowledge. It was around this time that some people moved to Namarai. The current population of the village is approximately 80, in 32 households.

The current village of Namarai was founded in late 19th century. During the 18–19th century, the ancestors of the Namarai villagers originally lived inland, near the waterfall of Deraimarama. Their inland village was said to have been fortified with palisades to protect themselves against frequent tribal warfare. The area is now utilised for *yaqona* (kava, *Piper methysticum*) cultivation. Villagers moved down to the current coastal area in 1877 to gain easier access to marine resources. Some of the villagers (belonging to *Yavusa* Nasausauwai) originated from the old village of Nabukadra to the southeast, where a story related to the custom of cannibalism is known. The population of Namarai is larger than Naocobau, with over 150 individuals in 35 households (according to Namarai Village Disaster Response and Action Plan, July 1 2015).

The lists of possible informants were provided by villagers, which included elders who had a certain knowledge of traditional lifestyles and ICH, as well as those who were willing to share their stories with us. While keeping the survey guidelines outlined by IRCI as a reference, we employed either semi-structured interviews or an unstructured interview methodology to explore and record whatever the informants wished to share with us. During the village survey, the team split into two groups to interview as many individuals as possible. In total, we were able to interview 15 individuals. In accordance with the regulation of the Ministry of iTaukei Affairs, Free Prior Informed Consent (FPIC) was obtained from all interviewees.

## DISASTER SITUATION

### Perception of Disaster

In this area, a cyclone (*cagilaba*) is considered the only major disaster factor affecting people's livelihoods, while other natural hazards are not recognised as disasters. Although coastal villages occasionally experience a degree of storm surge in association with cyclones, they are principally protected from tsunamis thanks to a wide reef flat. Earthquakes are infrequent and have caused no major damage to the villagers. People occasionally experience drought about once in every 5 to 10 years, during which time there may be no rain for 2 to 3 months. However, the area is not severely affected thanks to the rich spring water available in the area.

A few informants noted the deforestation that they feel has accelerated over the past 10 years, and that there used to be more bamboos in the vicinity of the village, hinting at the long-term effect of climate change and human-induced environmental degradation. Some Namarai villagers have noticed that seawater is getting closer during high tide, and that there are more lightening events.

### Major Disaster History

Large-scale cyclones have been experienced every 20 years: one in 1952, TC Bebe in 1972, TC Kina in 1992–93. Therefore, the villagers were expecting the next cyclone to arrive around 2012 but nothing happened. Then, TC Winston devastated the area in February

2016, which was certainly the strongest cyclone they had ever experienced. In addition to these cyclone events, there was a landslide caused by a heavy rainfall in 1995, which destroyed the water reservoir in Namarai.

Today, the community receive severe weather warnings via radio, which became commonplace by 1970s. Prior to that, at the time of the 1952 cyclone, there was only one set of radio equipment in the village, and the people relied on the weather report from the Nadi station, which was circulated only once a week. Therefore, it is likely that local knowledge and practice to prepare for the cyclone were more important at that time. Up until 1970s, for instance, at the time of TC Bebe, people made better preparations for the cyclone, such as cutting cassava stems and tightening house structures with bamboos.

Although people were aware that TC Winston was approaching, people did not prepare for the cyclone seriously or properly. Many people also mentioned that they did not really understand what a 'Category 5' cyclone was, because people were used to more direct scale indicators like knots.

## The 2016 Tropical Cyclone Winston and its Aftermath

TC Winston reached the area in the afternoon around 3 pm, blowing away almost entire settlements in the area. Gale force winds had a stronger impact on houses and settlements that were located on the top of a hill or hill slopes, while houses facing the coast suffered an influx of sea water caused by the storm surge. At the village of Naocobau located on the hilltop, nearly all houses were demolished, while a number of houses withstood the cyclone in Namarai. Naocobau villagers were advised by police officers to evacuate to Namarai, as there was a designated evacuation centre (community hall) available, but some stayed in the village. People in Naocobau village evacuated to cement or brick-built houses, including small bathrooms, to protect themselves from the strong winds. At Namarai, people evacuated to the community hall; however, all the evacuees inside were soaked with seawater that poured into the hall due to the storm surge during high tide (from 6 to 8 pm).

The first three days following TC Winston was the hardest time for the villagers. There was no water in both villages as they both share a water supply system located in Namarai, and people had to collect their water from a creek then boil it. They had lost almost everything, including clothes and household items, which were scattered in the forests and bushes, where people searched for whatever they could use. There were also all sorts of things scattered on reefs and mangroves. Since many people did not prepare for the cyclone, they needed to look for food and tried to harvest cassava roots that were left in their garden, otherwise they would be spoiled and rot. Supplies started to reach the area after three days or so, transported by boat. Their relatives in Suva and some other areas brought them food and other necessities. The SDA[5] church also provided 40 food packages, which included biscuits, rice, flour, and tinned foods, although it was a week after the cyclone event when these packages arrived. Affected people stayed in the Namarai community hall for almost two months.

Surprisingly, no instances of severe sickness were caused by the environmental risks to

5 Some villagers in Namarai belong to the Seventh-day Adventist Church.

health. However, the experience left some people, especially small children, with a traumatic memory and they now react highly emotionally to heavy rains and strong winds.[6] Villagers also learned many lessons from the tragic experience of TC Winston. Then, TC Zena struck in April 2016, only a few months after TC Winston. Although it was only a category 2 cyclone, the inhabitants of both villages came down to the Namarai community hall to evacuate, even without any warning from the Community's Disaster Management Committee (CDMC) or the police.

The villagers' experience of TC Winston was sometimes explained by referring to their Christian beliefs, saying that it happened because their faith was fading and that it was punishment from God. After that experience, the villagers became more devoted with increased family prayers, and greater expressions of kindness and care for others.

***Damage to environment***

TC Winston severely destroyed forest resources and agricultural crops. Coconut trees were all destroyed, which are a major source of cash income for the villagers. It took more than a year for the trees to recover. During the reconstruction process, some coconut seedlings were brought to the village for replanting.[7] Seedlings of *kumala*, and vegetables such as eggplant, Chinese cabbage, tomatoes, beans, and cucumbers, were also provided by the government and NGOs, to restore their subsistence agriculture.

Some people mentioned that coconut palms have not been growing well since TC Winston. Even during the time of the team's visit in September 2017, they were still waiting for their coconut trees to bear new fruits, by restricting the drinking *bu* juice (coconut water). This is troublesome for many aspects of villagers' lives. The lack of coconuts limits the villagers' cash income, as they are not able to produce copra. For women, coconuts are an essential ingredient for cooking. Many of their dishes are made with coconuts, even pies, scones, and puddings, and the typical Fijian dish *vakalolo* (coconut and fish) to be served to guests and visitors. Similarly, lemon trees do not grow as well as they used to.

TC Winston also damaged the marine environment. Fish population declined after the cyclone, and it took about 6 months for the population to recover. At some locations, the cyclone disturbed underwater rocks and sediments and transformed alongshore topography, which in some cases made certain traditional fishing practices difficult.[8]

***Positive outcomes of TC Winston***

Vegetation around the village started to regenerate after 2–3 months. Interestingly, many villagers noted that all plants and trees started to grow healthier than ever, including agricultural crops such as pumpkins, capsicums, tomatoes, pawpaws, and watermelons, without using any chemical fertilisers. Among other species, pumpkins became abundant and were growing everywhere without planting, as did *moca* spinach (*Amaranthus viridis*). Their staple, cassava, was also growing well on the new ground. It takes only four to five

6 For instance, there was a category 2 cyclone Zena soon after TC Winston (April 2016). Although it was quite weak as a cyclone, children cried as heavy rainfall reminded them of TC Winston.

7 SPC and Agriculture and Forestry Departments have a programme to stock seedlings as 'backup plants' to be provided at the time of disasters.

8 The case is heard from Koro Island, not in Namarai or Naocobau, where a special fishing practice associated with a particular rock became difficult because the rock itself was moved by the cyclone.

months to harvest much larger roots. Some people explained that the sea water that poured onto the ground during the cyclone delivered nutrients to the soil. The increased fertility may also be due to the clearance of forest canopy, thereby providing more sunlight.

## ICH ASSOCIATED WITH NATURAL HAZARDS AND DISASTERS (INCLUDING ICH POTENTIALLY USEFUL FOR COMMUNITY'S DRR/DRM)

### Hazard Indicators and Early Warnings

Traditional hazard indicators and early warning systems are by far the most prominent components of knowledge that are commonly shared among people. Also, the potential effectiveness of such knowledge about climatic anomalies has been recognised by DRM sectors as a useful means to reduce risks and prepare for disasters, especially in rural areas. Accordingly, Namarai village's disaster response and action plan[9] lists local early warning systems as a source of disaster warnings.

Common indicators predicting cyclones are:

- Breadfruit trees bear too many fruits.
- Bees make hives on the ground.
- The top of the flowering stem of *vudi* bananas bends downwards.
- Sea water temperature rises.[10]
- If the top of growing yam vine turns its direction in September, there might be a cyclone coming.
- A change in the wind direction and weather pattern also signals cyclones.

In contrast, heavy rains would stop when seabirds (known as *manumanu mai Vatu*) from the offshore Vatu Island came closer to the village. It was also mentioned that all animals in the village left before TC Winston hit the village, and then all returned when it had passed through.

Some recalled that people used to start preparing for the rainy season and cyclones around September to October, by investigating early warning signs. October in the iTaukei traditional lunar calendar is a time for tying thatched roofs and it also include preparations for natural hazards. Generally, traditional indicators issue warnings 1 to 2 months before a cyclone strikes. That was the case for TC Winston, and more recently, when TC Gita hit Tonga and some parts of Fiji in the Lau Group in January 2018. Traditional indicators provide ample time to prepare, while weather forecasts only foretell a cyclone approaching a week or a few days before it strikes.

9 'Namarai Village Disaster Response & Action Plan' (July 2015) has been put together by the Community Disaster Management Committee (CDMC), after receiving a 5-day training programme by Partners in Community Development Fiji, Disaster Risk Management and Climate Challenge Solution, and Ra Provincial Office.

10 An informant noted that sea temperature was very warm all night about a month before TC Winston.

Even though such knowledge is still held among the people, it is no longer tied to effective action to reduce potential risks. Typically, people mentioned that they had seen such indicators before TC Winston, but the majority of people did not really prepare for it in advance, until they learned about it through the radio and warnings from the government that a cyclone was approaching.

The early warning signs mentioned above comprise the indigenous knowledge developed by local people over generations to adapt to their environment and manage their resources and livelihoods. However, it is important to take the effect of climate change into consideration, which delivers new, unpredictable environmental conditions which may render existing knowledge ineffective.[11]

## Food Practices for Reducing Risks and Preparing for Cyclones

Some traditional knowledge exists about how to prepare for potential cyclones, especially in relation to food.

Securing food during and after a disaster is one of the most critical concerns of the people affected. This holds true not only for cyclones but also for other hazards such as extended drought that causes crop failure.

Some knowledge of traditional, emergency food was recorded. However, most of this information exists as knowledge among a few elders, and has not been practised for decades.

a) Traditional root crops: According to informants, some crops such as sweet potato (*kumala*, *Ipomoea batatas*), *kawai* (*Dioscorea esculenta*), *uvi* (yams, *D. alata*) are generally stronger against cyclones and last longer after a harvest, although they might be spoiled by heavy rain. Taro (*dalo*, *Colocasia esculenta*) and *via* (*Alocasia macrorrhiza*) are also resistant to cyclones. Thus, they could be harvested and stored in advance to prepare for a disaster. In the past, root crops were often baked for 3–4 days in a stone oven (*lovo*) to make them last longer.

Typically, harvested yams used to be stored in the 'yam house' (*qalolo*) that was built in the garden. Traditional yam houses were constructed from reeds (*gasau*) as walls, and thatched with coconut leaves. This house could store nearly 1,000 yams for 5–6 months. The house was also used for *kawai*. This practice of yam storage has been declining, partly because people do not plant as many yams as they used to, and partly because unknown people started to steal yams that were kept inside the yam house.

In contrast, the most common crop and the staple food for Fijians, cassava (*Manihot esculenta*), lasts only for a few days after harvest, and is easily damaged by the strong winds of cyclones.[12] Cassava is a new world plant that was introduced to the Pacific islands following Western contact. As it grows easily even in poor soil conditions without farmers making much effort, it replaced the cultivation of other important traditional crops such as

11 An informant mentioned that she feels the wind pattern has changed, possibly because of climate change.

12 To reduce this risk, it could be cut down at the stems prior to cyclone.

yams. From the viewpoint of food security and disaster risk reduction, this agricultural shift from the cultivation of yams to cassava in the long-term entails a shift from a highly durable and storable crop to a vulnerable crop, contributing to food insecurity (Campbell, 1984).

Relying heavily on cassava has also resulted in the reduction of crop diversity, and as a consequence there are now fewer alternatives that can be used during and after a disaster. Planting cyclone resistant crops would increase food security during a disaster. Such preparatory actions seem to be less common today in the Fijian context, as the local food economy is supplemented by imported foods, including rice and flour that are generally stocked within each household.

b) Emergency wild food resources: Some elders have knowledge of certain wild food resources that can be exploited during food shortages:

- *Via kelikeli* [*kelikeli* = digging in the bush], a kind of *Alocasia* taro grown in bush was once used as disaster food
- A bush vine called *walai* (*Entada phaseoloides*) is alleged to have been used for water
- *Walai* seeds (*cibi*) were also used to make *wai sova toni*, which was explained as a special food of Ra Province, although this has not been practised for more than 60 years.[13] Preparation of this toxic seed entails the following steps:

    1) Collected seeds are cooked in a pot until their endocarp cracks.
    2) The inner seeds are removed by breaking the endocarp with a stone.
    3) Seeds are put in a basket and soaked in running river water over 4 nights.
    4) Seeds are taken out. *Vaivai* leaves are placed in the basket, where seeds are mixed with some *kavika* (*Syzygium malaccense*) leaves to remove bitterness.
    5) The basket containing the seeds is again leached with running water for 4 nights.
    6) When ready, add sugar and eat.

c) Cassava preservation: The preservation of cassava through fermentation is characteristic Fijian food practice. This fermented cassava, known as *madrai ni viti* ('Fijian bread'), is made via a long process:

    1) Cassava is soaked in seawater for 4–8 nights.
    2) Once it is soft, bring it home and squeeze to expel water.
    3) A hole is dug on the ground, where some wooden sticks (*yasi ni idia*, a wood commonly used for fences around villages) are placed, and *vara* leaves are placed in 3 layers. The cassava is stored here and the hole covered with stones.
    4) Cassava can last for 3 months stored this way.

The practice was common until the early 1950s. An alternative way of making Fijian bread is to skip the seawater process, and to use a ready-made container instead of pits. Skipping the seawater process leaves food with a somewhat sour taste (*wiwi*). Some elders still practise such a method or even a much easier way, just soak the cassava in water, squeeze,

13 Some elderlies used to eat it in their childhood.

and dry it under the sun. Since a complex process of preparation makes cassava much softer, making this food suitable for consumption by the elderly. A more common cassava preparation practice today is to grate the cassava, mix it with coconut cream and sugar, then wrap it in banana leaves and boil.

Breadfruit fermentation, which is well-known in the Pacific, is no longer practised either, due to the increased use of flours and other imported food products.

There was a discussion about the revival of cassava fermentation/Fijian bread, because cassava is a common food resource that is widely cultivated. It is a typical traditional Fijian food, and could be effectively utilised as a disaster food.

d) Smoked fish (*vesa ika*): People also used to make dried fish, by smoking them on top of the fireplace. The smoked fish lasts for a month or so after using this traditional preservation.

e) Women's culinary knowledge to support the recovery: Cassava was largely destroyed by TC Winston. The roots went skinny and hardened, making them undesirable for consumption. However, women in the village managed to use such damaged cassava roots by investing extra effort to make them softer and more palatable. For instance:

- Cassava was grated first, then mixed with sugar and boiled. Grated cassava was also mixed with half-ripe *vudi* or *vata* bananas, instead of sugar.
- Cassava was cooked with 'Panadol' paracetamol tablets, mango branches, or baking powder, to make it softer.

Also, as mentioned above, the loss of coconuts affected women's cooking practice. To supplement the shortage of coconuts, women started to use pumpkins more frequently, which became abundant after the cyclone. As a result, pumpkin patties became popular among women in the village.

## Traditional Medicinal Knowledge

In one instance, traditional knowledge helped to save people from TC Winston and the disaster turned out to be an opportunity to transmit local knowledge. This was due to the local knowledge of traditional herbal medicine. There is a medicinal leaf that is known to stop bleeding. This leaf was used during TC Winston to help the injured, and those who did not know about the leaf also learned how to use it.

An informant from Namarai village used to be a nurse working at the village medical station.[14] Although she had learned traditional medicinal knowledge from her father, using such knowledge in the context of modern medical care as a nurse was considered inappropriate. Therefore, when she was consulted by villagers about traditional medicines and prescriptions, she only advised them without providing any traditional treatment. She had also served as a midwife, when there was no boat in the village and a pregnant

14 This medical station is staffed with a medical doctor and 2 nurses, who look after 7 to 8 villages within Nakorotubu District. At the time of TC Winston, the station temporarily took care of 14 villages nearby.

mother could not attend a hospital with facilities.

### Custom of *Solesolevaki*

*Solesolevaki* is when groups or community members work together for achieving a common goal, for instance, building houses and planting crops. Along with the leadership of the village chiefs, this custom effectively facilitated the cooperative reconstruction of the village after TC Winston. It was due to this system of cooperation that ruined houses were rebuilt and cassava was replanted.

### Rituals and Feasts

A marriage ceremony was planned in Namarai village in April 2016, which was postponed to December 2016 due to TC Winston, and yet it was conducted. Re-scheduling important rituals and ceremonies due to unforeseen circumstances are common in these communities, and is not really considered an interruption. Rather, postponing such activities may constitute a part of a community's coping strategy during an emergency, and a social mechanism to maximise the cooperative effort toward recovery.

### Traditional Houses

Traditional Fijian houses (*bure*) or *vale vakaviti* are no longer common in Fiji, except in certain areas such as Navala, where thatched wooden houses are intentionally retained. When the *bure* was still in common use, villagers used to prepare for the cyclone season every year around October, by placing bamboo against the posts to help hold the house together.

The construction of *bure* requires proper local resources. While some elders have knowledge of *bure* construction, it is not always easy today to secure the necessary resources. For example, a villager in Namarai was hoping to build his own *bure*, but TC Winston damaged key resources. For instance:

- *Dogo* (black mangrove; *Bruguiera gymnorrhiza*) is a coastal vegetation used for posts, which was all but destroyed by the cyclone (Figure 1).
- Coconut leaves are used for the walls, however, coconut palms were also damaged. This can be substituted by bamboo.
- *Magimagi* rope, made of coconut fibre, is used to fasten building components. As an alternative, a kind of bush vine (*wa me*, *Freycinetia storckii*), could be used.
- *Gasau* (reed) is used for thatching, as its leaves are strong against the rain.

Traditional *bure* employing local plant materials have been replaced by constructions made with commercial materials such as cement, bricks, corrugated tin, timber and nails, for many decades.[15] This must have led to the decline of the associated resource management. Yet, the important structures and spatial concepts of traditional *bure* have been transferred to contemporary houses, which enables the community to maintain traditional social relations, including taboos (*veitabuki*) surrounding the house. A Fijian *bure*

15 Some elders noted that they used to live in *bure* in their childhood.

**Figure 1**
*Dogo* trees destroyed by TC Winston (near Namarai village) (©IRCI, 2017)

**Figure 2**
Reconstructed Naocobau village (©IRCI, 2017)

typically has three entrances: one for the owner, another for the owner and their family, and the one at the front for other villagers and visitors, to invite people to come to their houses to eat.

The rebuilding of houses at Naocobau village displays the significant ways a disaster affects intangible sociocultural practices, in addition to the transformation of tangible housing structures and village landscapes (Figure 2). TC Winston destroyed almost all the houses in the village, and there was an urgent need to rebuild them to provide safe shelter. In the case of Naocobau village, the reconstruction of houses was supported by an organisation related to a Korean Christian mission, who imported standardised housing units from Korea and China to rebuild 27 houses in the village.

While these new houses helped villagers significantly during the recovery process, they gradually began to experience certain inconveniences and discomforts, primarily because the structure of these brand new houses had only a single entrance, which conflicted with their cultural behaviour.

The damage and reconstruction of houses after TC Winston illustrates how an experience of disaster transforms housing structures. The destruction of houses, in turn, creates an opportunity for renovation and innovation during the recovery process, rather than simple restoration. The government provided financial support for the affected households to

rebuild their homes.[16] While some claimed that the amount provided was insufficient, some appreciated it, as it enabled them to improve their homes.

At the time of the cyclone in 1952, all the houses in the area were still wooden constructions and some were still thatched (*vale vakaviti*). Although most of the houses collapsed, they were easily fixed or re-assembled within a month or so, because resources were readily available, and villagers knew how to build traditional houses. 10 houses were rebuilt following the traditional *bure* style. At the time of the cyclone in 1972, however, all the damaged houses were reconstructed using Western materials. Subsequently, by the 1980s, all houses were reconstructed with Western materials, and *bure* had disappeared from the village. As illustrated in this case, cyclone events provide opportunities to transform the village landscape over time.

However, the situation is quite different today, because fixing cement-block houses requires the purchase of replacement materials, and more importantly the knowledge of construction that utilises such materials. This remains a serious issue in Namarai village. Even though the government offered support to purchase building materials, individuals with the proper knowledge of construction are in short supply in the village. This has caused a considerable delay during the post-Winston reconstruction of the village and there many houses are yet to be rebuilt.

### *The advantages of bure*

Although no houses in the traditional *bure* style remain in either of the two villages, the advantages of *bure* can be gleaned from members of the older generation who actually used to live in them.

The first advantage was the comfort of living in *bure*. Despite the outside heat, the interior of *bure* remained cool. The *bure* layout incorporated a fireplace in the centre or against a wall, serving as an effective mechanism for providing warmth, smoking food, and preventing insects from nesting in the roof. The floor was natural ground where mats were laid with reed leaves or grasses as cushion; these were reported as being very comfortable to sit and sleep on. Some people complained that the wooden or concrete floors of modern houses give them back pain.

In terms of the layout of *bure*, it was normal to have a separate kitchen house. The kitchen house could also be used as a refuge shelter during a cyclone. Some people spoke of surviving a cyclone by clinging onto the beams of the kitchen house until the cyclone had passed by. Above all, as mentioned earlier, a *bure* was constructed entirely from local materials that were available around the village. Even if a disaster struck, villagers could fix and rebuild the damaged *bure* by themselves.

### *The village landscape reflecting disaster knowledge*

The settlement of Namarai village only extends out to the western side of the cove. The locals explain that this is to avoid cyclone winds. Since cyclones often approach Fiji from the direction of the Yasawa Islands in the west, the western side of the cove is better protected against winds by the mountains behind, thereby lessening the damage. Such a

16 The post-disaster relief by the Fiji Government to the affected community people started from the period of Prime Minister Ratu Mara (1984–1987).

choice of location could be understood as a community's strategy to mitigate disaster risks, reflecting local topographical knowledge, as well as the knowledge of cyclones that has accumulated over generations. However, TC Winston approached Fiji from the opposite direction – from Koro Island in the east. Therefore, being fully exposed to the strong wind, the settlement was severely damaged.

## THE IMPACT OF DISASTERS ON ICH

### Fishing

Fishing is a major subsistence activity for the villagers. However, there have been some declines in some fishing activities as well as a decline in the fish population over the past 10 years.

In 19 villages along the coast of Ra Province, a 10-year taboo to prohibit fishing was in place for the period of 2007–2016, to protect marine resources. TC Winston hit the area just before the taboo was due to be lifted, and as a consequence, it was extended for another 10 years.

Villagers lost their fishing boats due to the cyclone. However, some rafts were on the shore, and were frequently used for fishing to support their livelihood. Rafts, known as *bilibili*, are normally used by people who lived in the highlands of Fiji. It is a mode of transportation in rivers and due to the change in livelihoods, people living by the sea have also resorted to this type of rafts and are also well versed in laying a *bilibili* together as seen in Namarai and Naocobau. Although not much information was available about traditional fishing strategies which have been replaced by modern fishing methods, some associated knowledge such as the construction of rafts has been maintained, and when necessary, is actively put into practice. This is one example of the villagers using traditional knowledge during the process of recovery.

Today, major fishing activities are conducted individually by the men from each household, and line fishing is the most common method used. Night diving with harpoons used to be preferred for its high productivity; however, this caused the problem of overexploitation because fish were also taken during the spawning season. Some villagers noted that the fish population has decreased today.

There is also a special communal fishing technique known as *bikabika*, which is performed only by a group of women to catch seasonal *daniva* (sardines). There used to be certain areas where only women were allowed to fish. *Bikabika*[17] is an old practice using a *walai* vine that was tied to women's ankles to chase fish. Such fishing activities were performed occasionally until recently, but have largely been replaced by net fishing.

The decline of such traditional practices can be attributed to the impact of modernisation and associated lifestyle changes, as is often the case with many elements of ICH, rather than the impact of disasters.

17 *Bikabika* also means a funeral ceremony of a group of women surrounding a coffin.

## Weaving and Women's Handcraft Making

Women commonly practice weaving mats and baskets, which is a major source of income.[18] Three kinds of mats are known: *volikoro* (*kula* all around); *coco* (without any *kula* decoration); and *davodavo* (with 'ears') (Figure 3A).

Mats and baskets are typically made with pandanus leaves, by boiling and drying the collected leaves first. Traditionally, the black colour was added by boiling leaves that were pre-soaked with water for 3–4 days with the leaves of *koka* trees (*Bischofia javanica*). An iodine solution is occasionally used today to colour the fibre purple. One woman can produce one pandanus mat in 2 days if she worked intensively; in many instances, however, it takes 1 to 2 weeks because women usually have many household duties.

Pandanus leaves were also destroyed by TC Winston. After TC Winston, an area clean-up was necessary and pandanus needed replanting, which took about 6 months. Around August and September, they could begin to harvest leaves for weaving.

Another traditional weaving material is coconut leaves, which can be made into baskets (for

**A** Pandanus mat weaving

**B** A necklace made with coiled paper beads

**C** Fans made from coconut leaves

**Figure 3** Women's handicraft making (©IRCI, 2017)

18 A mat could be sold for about 100 to 150 FJD. If a woman sell a mat to a broker, it will be 30 FJD, which become 50 to 60 FJD at the wholesale. Fans with coconut leaves are about 15 FJD.

fishing and foods) and fans (Figure 3C). There are some elderly women who still creates various items with coconut leaves, however, the younger generation seem less interested in acquiring such skills.

Some younger women make beads from used paper, boxes, and packages, which are joined and made into necklaces and ornaments (Figure 3B). This is a practice that has been introduced very recently, but has attracted some women in the village. A necklace will sell for 10 FJD at the Rakiraki market.

## Long-term Transition of Major ICH Elements

A disaster affects ICH in several ways:

a) Disasters destroy natural resources, which makes certain ICH practices difficult but only temporarily. In this respect, the impact on ICH is a temporary interruption, rather than destruction. This was the case with women's weaving and certain cooking activities, as well as fishing.

b) Important customs like weddings are postponed, but never cancelled. This could be another social mechanism to cope with disasters.

c) In the case of houses in Naocobau, they were replaced by new constructions with an entirely new spatial design and concept. This may lead to the further transformation of residential structures and associated practices, when such elements are fully absorbed into the living culture.

The transformation of ICH is more closely linked to long-term sociocultural changes than the impact of disasters. Some noted that the loss of ICH is in part related to Christianity and modernisation, which has transformed traditional lifestyles and people's mind-sets.

Typical ICH practices such as *masi* (tapa) making and *meke* (Fijian traditional dance performances) were practised until the 1950s or so, but have long ceased. *Lali* (wooden drums) for dances were also replaced by guitars, a common musical instrument used in church. The use of traditional wooden knives, the fireplace inside the house (*miqa*), and traditional cooking pots also ended around the 1950s. Salt (*masima*) was once locally made from seawater, which was an important item to exchange with the inland communities.

However, certain ICH elements that are important for maintaining the social order and holding the community together remain valued and respected to the present day. For example, *tovo vakavanua* (customs of respectful behaviour), *yaqona* (kava) ceremonies, and *bose vakoro* (village clan meetings) remain.

### *Modernisation and sociocultural transformation*

Disasters aside, modernisation is an important factor contributing to sociocultural transformation. Given that many of the informants in this study were elders, there was a commonly-voiced opinion that modernisation was the main cause of sociocultural transformation. The following were some specific examples offered:

- It used to be important to respect your elders. For instance, if you walked across in

front of an older person, you had to bow as you walked.

- It used not to be allowed to shout or run in the village. Many children and young people these days do not abide by that.
- There is a custom of calling out, called *tama*, when you visit someone's home. The guest calls out, '*dua, dua, dua*' and the host responds with '*o idua*' in Ra dialect. The young people no longer follow this custom.
- Young women were cherished by their family. It used to be that even when they were married, the man would become part of the woman's family and follow that family's traditions.
- They used to have meals twice a day: in the morning and in the evening. It has now become more common place to cook instant noodles or other meals that are quick and easy to prepare. They now consume a lot more of this, causing serious health problems.
- It used to be a common practice (*takitaki*) to share meals with neighbours, but it has become less common in these days.
- Women's hairstyles have changed a lot. Women were only allowed to wear the traditional *buiniga* hairstyle. They also used to dye their hair with a boiled mixture of bark, mud and coral lime. Both men and women used to do this – it was good for keeping the hair healthy – but nobody does it now.
- The young people do not respect their elders anymore, while they always assert their own rights. They think this is the influence of the modern education system. There is a primary school in Namarai and the children from two villages go there, but the only secondary schools are in towns like Lautoka and Rakiraki, so the children have to leave the village. Many young people go to the towns for work after they finish school, so there are few opportunities for them to learn village customs. Once young people leave the village, they tend to start asserting their own rights even when they return to the village.

***The influence of Mesaia movement***

The impact of the *Mesaia* (Messiah) movement is worth mentioning in the context of the challenges of modernisation. The *Mesaia* cult swept Naocobau with its influence during the 1980s and 1990s. Founded by a man by the name of Nabogibogi Sairusi, the movement honours the traditional Fijian way of life (Lal, 2012, p. 269). Followers wear white; the women, in particular, wear white with long hemlines. The symbol of the cult is a blue flag depicting the moon and stars. Followers shun sin and strive to live a pure and righteous life. They strive to keep their surroundings pure, including cleaning the house every morning without fail and airing out their bedding every week. Menstruating women are not allowed to take part in religious rites. They hold regular meetings, called a School of Motivation, where they study the Bible and learn Fijian culture.

Some of the residents of Naocobau converted to the *Mesaia*, creating tensions that divided the village. This was eventually resolved by them de-converting. However, there are still some residents who believe the *Mesaia* teaching to be the truth and practice it as individuals. Although Nabogibogi Sairusi founded this cult during the 1950s and 1960s, the movement that acknowledges Fijian traditions reawakened during the 1980s and 1990s.

This was most likely the period when traditional customs and practices began to transform considerably, therefore, the movement's revival could be understood as an act of resistance to such changes.

## CONCLUSION

Although the two villages surveyed in this study, Naocobau and Namarai, both suffered severe damage from TC Winston, no major visible damage was observed in relation to ICH. Instead the impacts on ICH were observed as temporary intermissions, caused by the depletion of natural resources. However, this does not necessarily mean that there were no difficulties safeguarding ICH in these two villages, because ICH and traditional culture had undergone major transformations before the disaster due to the impact of modernisation. The disaster and the reconstruction that followed certainly accelerated the progress of modernisation.

Taking the traditional *bure* as an example, there were no remaining *bure*-style houses in either of the two villages before the disaster, and the knowledge and skills to build *bure* had almost been lost. Nevertheless, when people started building houses with commercial materials, they incorporated some elements of *bure*, such as having three entrances. However, it should be noted that the introduction of temporary standardised housing in Naocobau following TC Winston has expedited the loss of the cultural elements inherited from *bure*.

Assuring rapid recovery has been the top priority for the community's DRM. However, no consideration has been given to cultural elements during the reconstruction process, creating concern that this will accelerate the loss of traditional culture, including ICH.

However, incorporating traditional knowledge and other ICH elements into DRM and reconstruction projects ensures they are grounded, and more effective in the community. For example, there was a lot of traditional knowledge of hazard indicators. While such knowledge may sometimes contradict science, it is likely to have a valid function in local situations in the region. Similarly, traditional food storage methods and the like may help provide emergency food rations during a disaster.

When considering the question of ICH and disasters, it is important to discuss not only how to save ICH from disasters, but also how to utilise ICH in DRM. In addition to disasters, it is important to give adequate attention to other factors that may cause sociocultural transformation, such as modernisation.

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# INTANGIBLE CULTURAL HERITAGE AND NATURAL HAZARDS IN THE PHILIPPINE CORDILLERAS: PRELIMINARY REPORT OF THE FIELD RESEARCH IN ABRA AND IFUGAO

Yoko Nojima[1], Tomo Ishimura[1,2], Cecilia V. Picache[3], and Norma A. Respicio[4]

## INTRODUCTION

This article reports the notable findings of the brief field study on intangible cultural heritage (ICH) and natural hazards in Abra and Ifugao in the Cordillera region in northern Luzon, the Philippines, while specific details are still under analysis and are yet to be presented elsewhere.

The activity was implemented in January 2018 by the International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI) in cooperation with the National Commission for Culture and the Arts (NCCA), Philippines, as part of IRCI's 'Preliminary Research on ICH Safeguarding and Disaster Risk Management in the Asia-Pacific Region'. It seeks to understand the current ICH situation related to hazards and disasters among indigenous communities in the mountainous areas of the Philippine Cordilleras.

The general goals of the field study are to identify (1) varieties of ICH in the area that are related to natural hazards and disasters, (2) the impact of natural hazards and disasters on ICH and (3) the positive aspects of ICH and to understand the mechanisms of community resilience in which ICH plays a significant role.

The following factors contributed to the field survey planning in Abra and Ifugao:

1) The Philippines is one of the most vulnerable countries to natural disasters, ranking third in the World Risk Index in recent years (Bündnis Entwicklung Hilft, 2017). The nation has been frequently exposed to various natural hazards, including typhoons, floods, earthquakes and volcanic eruptions. Therefore, case studies in the Philippines are expected to provide important insights for investigating ICH issues in relation to natural disasters in the Asia-Pacific region.

2) The majority of case studies within the framework of IRCI's project on ICH and disaster risk management (DRM) focus on coastal communities, and our

1 International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI), Japan
2 Department of Intangible Cultural Heritage, Tokyo National Research Institute for Cultural Properties
3 National Commission for Culture and the Arts (NCCA), Philippines
4 Department of Art Studies, University of the Philippines-Diliman

understanding of ICH in the context of natural disasters in mountainous areas remains poor. Along with studies conducted in northern Viet Nam (contributions by Nguyen An Thinh et al. and Phan Phng Anh and Vu Canh Toan, this volume), this study provides cases of ICH and natural hazards in mountainous regions.

3) The Cordillera region has rich ICH elements that, to a considerable extent, recorded by the ICH Unit of the NCCA, Philippines (Peralta, 2013), which provides a good baseline for research, as the area's ICH inventory enables us to assess the impact of natural hazards. Such a survey provides an opportunity to monitor and update the situation of ICH elements recorded by the NCCA, and such an attempt could be further elaborated as a potential model for post-disaster assessment of ICH.

4) One of the regions, Ifugao, is also known for its terraces for intensive rice cultivation, which are part of the UNESCO World Heritage sites ('Rice Terraces of the Philippine Cordilleras'). These rice terraces are a good case for examining the nature of traditional environmental management systems as an element of ICH and how such practices have enabled people to sustain their cultural landscape for generations against various natural hazards. This could also be a good example displaying the importance of intangible knowledge and practice for managing tangible cultural heritage.

5) Ifugao also has ICH elements that are inscribed on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity ('Hudhud chants of the Ifugao' and, more recently, 'Tugging rituals and games'). Although this study does not specifically focus on the elements inscribed on the list of the 2003 Convention (Convention for the Safeguarding of the Intangible Cultural Heritage), a strong community awareness regarding the safeguarding of ICH is expected to be established already. For this reason, a model of community-based DRM mobilising ICH could be developed in the future.

## SURVEY IN THE CORDILLERAS

### Activities and Approach

This study concentrated on indigenous communities in both Ifugao and Abra (Itneg). A field trip was organised from 25–31 January 2018 (25–27 January in Ifugao and 29–30 January in Abra), and the team conducted a series of interviews and focus group discussions in several different barangays and communities.[5] Informants were identified through NCCA's network and included artisans, ritual specialists, farmers and community representatives, as well as a few local university researchers who have been leading community extension programmes. Therefore, rather than depict a specific community's situation in detail, this study tried to pick up various ICH-related concerns and interests in the context of natural hazards and risk management.

5 The proposal for this study was approved by the National Museum of the Philippines and endorsed by the National Commission on Indigenous Peoples.

## Indigenous Peoples in the Study Area

**Abra:** Abra is a landlocked province west of the Cordillera. It is bounded by Ilocos Norte and Apayao on the north, Mountain Province and Ilocos Sur on the south, Kalinga on the east and Ilocos Sur on the west (Local Governance Regional Resource Centre, n.d. a).

The Itneg, also referred to as the Tinguian (as in Fay-Cooper Cole's two-volume work on the Tinguian, 1915 and 1922), inhabit the areas between the foot of the Cordillera and the Ilocos Range in Northwestern Luzon. They have been classified into several groups: Adassen, Binongan, Inlaud, Masadiit, Aplai, Banao, Gubang, Maeng, Muyadan, Luba and Balatok. There is a very close affinity with nearby Ilocano groups, with whom they have a continual relationship (Respicio, n.d. and Peralta, 2000).

Two general groupings exist: those who live in the valley, which are a homogenous and concentrated population in the lower reaches of the province of Abra who thrive on wet rice cultivation, and those who live in the mountain, who depend on dry cultivation and root crops in the higher elevations (Peralta, 2000). The current interviews covered only the former group. An Ilocano farmer and national living treasure who lives in Abra was also interviewed.

**Ifugao:** Ifugao sits at the foot of the Cordillera Mountain Ranges. It is bounded on the west by Benguet, on the south by Nueva Vizcaya, on the east by Isabela and on the north by Mountain Province (Local Governance Regional Resource Centre, n.d. b).

The Ifugao people are divided into two subgroups – the Tuwali and the Ayangan. Famous for building massive rice terraces covering entire mountainsides, they are also known for their very complex indigenous religion marked by a cosmology that includes hundreds of deities. Elaborate rituals accompany personal and social events, participated in by choirs of ritual practitioners (Peralta, 2000). This time the interviews only covered the Tuwali of the towns of Lagawe, Hungduan, Hingyon and Banaue.

# FINDINGS

## Natural Hazards in Abra and Ifugao

In Ifugao, typhoons and landslides triggered by excessive rainfalls (often during the typhoon) or earthquakes are considered a major hazard risk. People's concerns on disasters largely pertain to the potential harm to their livelihood, specifically the damage to their rice terraces. Accordingly, damage to rice plants and grains due to various pests, such as worms, earthworms, grasshoppers and rats, was raised as another major risk factor.

A few informants recalled the impact of the 1990 Baguio earthquake in Ifugao, which included collapsed buildings and cracks in the ground. A typhoon in the 1970s also caused many landslides, which destroyed roads, rice terraces and houses, and strong winds damaged many areca palms (betel nut trees). Informants also mentioned a drought in the 1990s in which there was no rain for six months. Unable to harvest rice, people supplemented their food supply with 'kamote' (sweet potato) and other root crops and vegetables.

The people in a barangay help each other (*badang*) to cultivate rice on terraces, to maintain their irrigation system and to overcome calamities and recover.

Several early warning signs of calamities include:

- an orange-coloured sky and fast-moving clouds, which both suggest an imminent typhoon. However, if such clouds were very high, the area would not be hit.
- a species of bamboo (*bikua*) that, when it bears fruit or flower, signals a looming drought.
- a black bird (*pipiwong*) flying through and touching water in the rice field, which indicates forthcoming rain.

As part of the Cordillera Administrative Region, Abra is not as mountainous as other provinces. Typhoons are major disaster risks here as well as earthquakes due to active faults. As is the case in Ifugao, Abra's concerns include damage to rice and other agricultural plants by pests. Logging and mining industries in the mountain areas northeast of the region have also increased the risk of landslides and affect Abra's major river system, causing more frequent river floods and river water pollution.

Soon after the Baguio earthquake in 1990, a typhoon and subsequent landslides ravaged many houses, gardens and livestock. One of our interview area, the town of Manabo at that time was not heavily affected and accepted many evacuees from surrounding areas.

Itneg groups in the mountain areas traditionally practice a local natural resource management system known as *lapat*, which involves various restrictions on resource exploitation. It is noteworthy that this system has been institutionalised in this region as part of the province's resource management system.

## Role of Rituals to Confront Disasters

In both Abra and Ifugao societies, rituals are an integral part of their daily lives. While performed in many occasions including important ones before planting and harvesting rice, rituals also serve as protection from disasters.

Among Itneg groups, *pinaing*, a sacred space comprised of a collection of river stones representing deities, constitutes the centre of their beliefs and ritual activities and also functions as the core of the community. According to the ritual specialists in Manabo, major natural hazards such as typhoons, droughts and earthquakes are explicitly described within their cosmology in relation to various deities. In the case of typhoons, 10 siblings cause various phenomena: one responsible for strong winds, one for heavy rains and so forth. When they recognise an impending typhoon, they would perform a ritual so that it does not cause much damage.

In Ifugao, we have also been informed of various rituals protecting people from typhoons, those to bring or stop rains and those to protect rice from pests although they are ineffective for certain kinds of pests. Ritual specialists called *mumbaki* perform rituals, and their knowledge and skills are held and inherited within certain lineages. Despite their fundamental role in Ifugao societies, transmission of ritual practice is in danger and the number of *mumbakis* has been declining because the remaining *mumbakis* are generally

elders and younger generations are getting less and less interested in learning such traditions.

## Natural Hazards and ICH Practices

### *Weavers and wood carvers in Ifugao*

An Ifugao weaver noted that landslides blocking roads make it difficult to obtain cotton threads for weaving, as they are now generally purchased in Baguio. She practises mud-dyeing, and the source of the special mud for this purpose is located within an area of rice terraces. This source has been maintained over generations along with the management of rice terraces, without any notable damage.

Woodcarving production has re-emerged through cultural revitalisation programmes and the associated emphasis on tourism development. Thus, young generations of carvers are learning the skill. Rather than the risk from natural hazards, they are more concerned about excessive logging caused by an increased population and a higher demand for wood. This and government regulations prohibiting logging activities both cause the decreased availability of raw wood materials for carving.

### *Rice cultivation in Abra and Ifugao*

In terms of the risk against hazards and disasters, local people's anxieties in both Abra and Ifugao are closely linked to the threat and damage to their rice production. As mentioned earlier, typhoons and earthquakes that cause landslides and erosion which then damage terraces are the major factors threatening their harvest, along with droughts and pests.

Traditional varieties of rice, which are important for subsistence and rituals, have been cultivated among the interviewed Ifugao and Itneg communities, while such varieties have been replaced in some areas by imported ones that grow much faster and are higher in productivity. In Ifugao, rice wines (*bayah*) are necessary in the performance of rituals, including informal ones.

The rice terraces in Ifugao have in fact demonstrated the successful transmission of intangible knowledge and practice of rice cultivation for over hundreds of years. Every household owns a terrace and works under the leadership of the elite family (*kadangyan*) having larger fields and yields. Artisans such as weavers, wood carvers, and blacksmiths are also fundamentally farmers in many cases and prioritise working on their terraces as well.

As part of UNESCO's World Heritage list, Ifugao's rice terraces have received considerable recognition from the international community. ICH elements inscribed on the representative list of the 2003 Convention, *Hudhud* chants and *Punnuk* (tugging rituals), are also part of Ifugao's agricultural practice. In the contemporary context, the Ifugao rice terraces prove to be immensely valuable as a cultural resource intertwined with regional development and tourism through cultural heritage promotion.

## SUMMARY AND CONCLUSION

The traditional knowledge and practice of rice cultivation in Ifugao and Abra as well as local resource management systems, such as the Itneg's *lapat* system, may be considered essential to environmental sustainability and disaster risk reduction.

The interviews with indigenous peoples in Abra and Ifugao indicate the importance of rituals in facing natural hazards and disasters. As an integral part of the community and as an articulation of their belief system, rituals provide people a sense of assurance or confidence that they are protected from any calamities including natural ones. More importantly, rituals play a significant role in shaping their cultural identity as indigenous people.

No disasters have devastated these regions in recent years, but ritual practices themselves are facing decline because transmission of ritual knowledge has not been successful in many communities. In the long run, this could weaken the integrity of their cultural systems and thus reduce their ability to cope with natural hazards.

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# INTANGIBLE CULTURAL HERITAGE FOR DISASTER PREPAREDNESS, RECOVERY AND RESILIENCE AGAINST NATURAL HAZARDS IN A COMMUNITY IN SAN NICOLAS, BATANGAS, THE PHILIPPINES

Soledad N. M. Dalisay[1] and Madilene B. Landicho[1]

## INTRODUCTION

Early studies on natural hazards and disasters have been dominated by the more technical aspects as well as the design of engineering solutions in the mitigation of these hazards. Recent developments in hazards and disaster research, however, reflect the growing interest of social scientists in this field. This has been attributed to the success of the Simeulueans and the Moken in using local knowledge for stemming massive destruction when a tsunami hit their villages on December 26, 2004 (Dalisay, 2014). Moreover, this incident has drawn the attention of international organisations to the roles of various domains of Intangible Cultural Heritage (ICH) including local knowledge, in disaster risk preparedness, recovery and resilience. Some of the relevant literature in this context looked into local beliefs involving signs from plants, animals and celestial bodies in predicting the occurrences of hazards (Pareek and Trivedi, 2011; Dalisay and Tatel, 2011; Cerdena 2008; Irfanullah and Motaleb, 2011). Others cited beliefs in the supernatural in relation to how people viewed hazards in their environment (Roncoli, Crane and Orlove, 2009). Folklore was also viewed as repositories of the wisdom of the elders and spoke of lessons on how to cope with the dangers posed by hazards and inform people about what to do or where to go when faced with hazards (Ngoc Huy and Shaw, 2008; Arunotai, 2008). Other studies pointed out the value of social capital in times of disasters (Rumbach and Foley, 2014; Henry, 2007).

This paper aims to contribute to the expanding field of disaster social science, by presenting a case study of a community in a province in the Philippines and how the people in this community engaged with natural hazards through specific domains of ICH. Furthermore, this paper will also delve into the impact of natural hazards and disasters on the various domains of ICH. Disaster vulnerability does not cover people alone. The integrity and sustainability of ICH is also vulnerable to disasters. ICH gives a group of people a sense of community and identity. It is a vital aspect of the everyday lives of a community of people. ICH provides people with the tools and knowledge with which they could effectively cope with their environments. On the other hand, ICH could also contribute to people's vulnerability to hazards. Because of the importance of ICH in peoples' lives, it is vital to ensure that the safeguards to ensure its continuity are in place.

1 Anthropology Department, University of the Philippines-Diliman

## Objectives of the study

In general, this study aimed to present narratives of disaster in the context of domains of ICH in a community in the Batangas province in the Philippines (Figure 1). More specifically, this study aimed to:

a. Describe the experiences of people in a community in southern Luzon island of the Philippines as they engage with natural hazards in their environment.
b. Identify domains of ICH relevant to peoples' engagement with natural hazards.
c. Determine as to why new forms of ICH were developed and how these were incorporated in the people's ways of life and their worldviews.
d. Identify the roles of ICH in people's preparedness, recovery, and resilience in the face of disasters.

## Methodology

A focused group discussion (FGD) among selected community members with experiences of disasters were identified and recruited for the study. A total of seven informants participated in the FGD. Almost all except for one were in the 60–85 years age range. The youngest was 61 years old and the oldest was 84 years old. All the FGD participants used to live in the *pulo* or island at the foot of the volcano. They were *bakwit* or evacuees who had originally resided in the island at the foot of the crater of the volcano. They fled the island during the volcano's eruption in 1965 and permanently resettled in a community just across the island. All the informants were married and had adult children, some of whom also lived in the community while the others were living abroad as Overseas Filipino Workers (OFW). All of them were already retired. In-depth interviews were also conducted with informants that included young adults to gather additional information on the community members' experiences with natural hazards particularly, in the role of relevant ICH domains in this context. Ethical consideration included seeking informed consent of the study informants for both the FGD and the in-depth interviews as well as to include their photographs in the report. Actual names of the informants were not included in the report; pseudonyms were used instead. The name of the study community within the municipality of San Nicolas was also not mentioned in the report.

## THE STUDY COMMUNITY

The study was conducted in a small barangay or community within the municipality of San Nicolas in Batangas province, the Philippines. San Nicolas is composed of 18 barangays which used to be part of the older municipality of Taal—established in 1572 by the Spanish colonisers. In 1955, the 18 barangays were separated from Taal and formed a new municipality which is now San Nicolas. Almost all of these 18 barangays are located on the shores of the Taal Lake which surrounds the small crater of the Taal Volcano. San Nicolas is the smallest municipality in the Province of Batangas with a land area of 14.37 $km^2$ only. It is classified as a 5th class municipality. The population is estimated to be 22,623 based on the census in 2015. Up until the most recent eruption of Taal Volcano in 1965, the main source of living was farming and fishing.

This study focused on one of the barangays or communities in San Nicolas. Currently, many of the families in the study barangay depended on one or more family members who are


**Figure 1**

Map of the Philippines showing the location of Batangas province (The Official Website of LOBO, 2010).

OFWs in the Middle East and Europe. Situated right across the lake from the crater of the Taal Volcano, the barangay is the largest in the municipality in terms of population, having a total of 2,980, according to the 2015 household survey conducted by the local government. It is also composed mostly of families who had evacuated the foot of the Taal Volcano following its 1965 eruption. The evacuees felt that the area across the lake was safe from the hazards that the volcano posed. More importantly, they already had relatives who were residing in this area. Hence, they were warmly welcomed and were provided with much needed material and emotional assistance in the aftermath of the eruption. Within the barangay is a chapel as almost all of the residents are practising Catholics. They have a health centre and a small public market. *Sari-sari* stores are small stores selling items *tingi* (by piece) such as processed food and products used for cooking and bathing, school supplies, among others. The local government of San Nicolas and all its barangays has a disaster risk reduction and management office as mandated by the law.

San Nicolas is very close to the municipality of Taal, the latter being a major historical, tourist and commercial site. Residents of San Nicolas would often travel to the public market in Taal for their needs as the local market in their own municipality does not offer the range of food and other products that could be found in Taal. Restaurants and resorts are also more common in Taal. Taal is also known for its crafts that include intricate embroidery done on very fine Philippine silk cloths like the *jusi* and the *pina* (Taal Heritage Town n.d.). While the cloth itself is woven elsewhere in the Philippines, the embroidery is done in Taal. The material is sewn into clothing of both men and women and is usually worn on formal occasions (Figure 2).

**Figure 2**
Embroidered *pina* cloth from Taal depicting the *callado* technique and beading (©Soledad N. Dalisay, 2017)

Other crafts in Taal include the *balisong* (fan knife). There are also food delicacies like the *kapeng barako* (coffee), *tapang Taal* (processed beef or pork), the *suman* (rice cake), the *panutsa* (peanuts in caramelised brown sugar) and the *tawilis* (*Sardinella tawilis*) which is a species of fish that supposedly exists only in the freshwaters of Taal Lake.

Taal is also considered a heritage town because it is home to the Minor basilica which was supposedly built during the Spanish colonial period of the Philippines. This basilica is a major place of worship for devout Catholics including the people from San Nicolas. Moreover, as was customary during the period, the houses of the Spanish elites were built in close proximity to the church. Today, many of the colonial architecture still stand within the vicinity of the Basilica. Some have been converted to museums and restaurants. Hence, this town has been named as one of the heritage towns in the Philippines which attract both local and foreign tourists. It is also a gateway to the Taal Volcano which is just a *banca* ride away and another tourist attraction. It has a local heritage office and has been working on having the town listed as one of the UNESCO World Heritage sites.

Taal has its own Disaster Risk Reduction and Management Office under the local government. This office is responsible for all programmes and projects on DRRM within its jurisdiction.

## NATURAL HAZARDS EXPERIENCED

When asked about natural hazards that they have experienced in their area, all the informants mentioned that there were typhoons, earthquakes and volcanic eruptions. The Philippines itself experiences around 20 typhoons in a year and many of these pass through San Niclolas.

The study informants mentioned that the *bagyo* (typhoons) were quite regular but none of these were as significant as volcanic eruptions, since lives were not lost and property was not severely damaged. The only typhoon they remember to be particularly devastating was Typhoon Rosing (International Code Name Angela) which made landfall in 1995. The respondents described the Typhoon Rosing to be strong enough that roofs of the houses of some of the residents were blown away and flood waters entered their homes.

Earthquakes or *lindol* were experienced by the residents but these were regarded more as

signs of an impending volcanic eruption rather than a hazard by itself. Their experiences of earthquakes had always been in association with the eruption of Taal.

What seemed to be clearly etched in the informants' memories were the eruptions of the Taal Volcano they referred to as *pagsabog ng bulkan*. While the volcano's most recent eruption had been in 1977, it was the 1965 eruption that had caused major damage and loss of lives enough for most of the village folk that lived in the settlement at the foot of the volcano to move to other areas permanently. All of the FGD participants and most of the interviewees were old enough to have experienced the 1965 eruption of the Taal Volcano and they all had vivid memories of the eruption that broke the silence and tranquillity of the early morning of September 28, 1965.

## PERCEPTIONS OF THE VOLCANO AND VOLCANIC ERUPTIONS

The Taal Volcano is the second most active volcano in the Philippines after the Mayon Volcano which is located in the Albay Province (Phivolcs, n.d.). It has an elevation of 0.311 km and is described as a complex volcano composed of the main Crater Lake, the Taal Caldera and the Taal Lake. Taal Lake fills the volcano's caldera. It has had more than 30 eruptions in recorded history since the 1500s (VolcanoDiscovery, n.d.). Its majestic cone commands quite a view from vantage points from two provinces and one city within its environs. It can be easily viewed from Tagaytay city and Batangas and Cavite provinces. The view from the study barangay presents an impressive sight of the volcano's caldera. For a tourist who has not experienced the 1965 eruption of Taal, the view is quite impressive and haunting. However, for those who have been part of the frenetic efforts to escape the magma and ash spewed by the volcano in 1965, the view is fearsome and foreboding (Figure 3).

The study informants appear to be ambivalent about the Taal Volcano. On one hand, it has wrought so much devastation and loss, specifically during its eruption in 1965, and those who have experienced it still hold the painful memories of their suffering. On the other hand, the volcano has also been a source of abundant resources and many of the village people depend on the fertile soil at the footsteps of Mount Taal and the lake surrounding

**Figure 3**
The Taal Crater and Taal Lake (©Soledad N. Dalisay, 2017)

it for their living until this day. Hence, some families have returned to the island regardless of the threat of another equally devastating explosion. The volcano is also a viable source of income in another way; it is currently a popular tourist attraction. The local governments of San Nicolas and Taal have capitalised on the volcano's popularity through organised tours with *banca* rides to the crater and other activities such as horseback riding and treks in areas around the crater itself. Locals earn income as guides too.

There are constructions going on around the lake, turning its once sandy shores into a bay walk. They are preparing for an expected influx of tourists especially because a few resorts owned by foreigners have started to operate in nearby towns.

For all of the study informants, the Taal Volcano's eruption is something to be feared. While there were those in the community who were too young to have experienced the 1965 eruption, their elders have relayed to them enough of the stories of devastation and suffering to make them fear the volcano. According to the informants of this study, they still fear crossing the lake going towards the volcano. Whenever they cross, the lake they would recall images of that fateful day in 1965.

The study informants, however, did not agree as to whether another explosion would still be possible. Elsa, one of the informants, felt that because the Taal Volcano had not erupted for several decades since its last eruption in 1977, it will most likely not erupt anymore. Lina, another informant, however, countered this notion by saying that *traydor ang bulkan* (the volcano is a traitor). It is *mabagsik* (fierce). She compared it with the Mayon Volcano in Albay, another province in the Philippines, by saying that unlike the Mayon Volcano which gives signs of an impending explosion by emitting smoke from its crater, the Taal Volcano is 'silent' and does not give warning signs. It just suddenly explodes.

## THE VOLCANIC ERUPTION OF 1965

Because the eruption of the Taal Volcano in 1965 had been significant in the lives of the study informants, it is vital to narrate some of the informant's personal experiences in this report. The stories of Tatay Tonio and Nanay Madring are relayed herein.

The volcanic eruption took place in the very early hours of the morning of September 28, 1965. During this hour, most of the residents at the foot of the volcano's crater were asleep; hence, the eruption had been quite deadly with some of them no longer waking up to save their lives. Tatay Tonio shared during the FGD session that warnings were allegedly not given out to the residents because the one who was supposed to give out the warning did not want to disturb the sleep of the residents. He opted to wait till the daybreak to warn the residents of the possibility of an eruption. He probably did not think at that time that danger was imminent. The eruption, however, occurred before daybreak. The volcano spewed fire, stone and ash, burning everything around it. Several of those who were awakened by the explosion managed to grab some of their belongings and ride on the *banca* to move away from the island. Not everyone who was able to flee, however, survived. According to Tatay Tonio, only those who fled towards the north were saved. Those who went to other directions were hit by the pyroclastic materials released by the volcano and died. Those who followed the direction of the flow of the water lilies on the lake went north towards Talisay and were the only survivors.

Today, the local volcanology office has set up a warning system that will inform people of a volcanic eruption. A *batingaw* (bell) was set up on the island and a staff member of the volcanology office is supposed to ring it whenever the volcano is showing signs of an eruption. Moreover, the Republic Act 10121 of 2010 or the Disaster Risk Reduction and Management Act of 2010 (GOVPH, 2010) requires all levels of government to have a plan and to carry out those plans to prevent the occurrence of disasters.

## LOCAL ICH IN ASSOCIATION WITH NATURAL HAZARDS AND DISASTERS

### Local Knowledge

#### *Signs from nature*

The informants mentioned some signs from nature that warned them of the coming of natural hazards, particularly, the *bagyo* (typhoon) and *pagsabog ng bulkan* (volcanic eruptions). These were identified during the FGDs as natural hazards that they encountered in the barangay (Table 1).

**Table 1** ICH in a community in Batangas, associated with hazards and disasters

| Hazard | Local ICH |
|---|---|
| Typhoons | Signs of an upcoming typhoon<br>•*Dag-im* (cumulonimbus clouds)<br>•*Maiging na tunog ng hangin* (howling winds)<br>•Turbulent flow of Taal Lake |
| Volcanic Eruptions | Signs of an impending eruption<br>•*Alulong* (howls) of dogs<br>•Birds not usually seen in the island seek refuge in the houses<br>•*Naburog* (rumblings heard from under the ground)<br>•Unusual sounds from the lake similar to sound of water that got into someone's ears<br>•Extreme heat in the environment<br>•Smoke from the volcano's crater<br>•Earthquakes of low intensity<br>Local tales of the supernatural<br>•Water lilies showing the path to safety<br>•Strange people seen on the island |
| | Rites and Rituals to guard against disasters<br>•Throwing coins and sweets on the lake to appease spirits<br>•Avoiding greeting someone in the boat when crossing the lake<br>•*Pagluluwa* – prayer and procession |

#### *1. Signs of a coming typhoon*

The presence of cumulonimbus clouds was seen as a sure indication of strong rains or typhoons. They called these clouds *dag-im* and noted that the *dag-im* was usually accompanied by strong, howling winds that they called *maiging na tunog ng hangin* and that the level of the water of Taal Lake would be unusually high and full and the flow was quite turbulent prior to a typhoon. When these signs occurred all together, the residents were alerted and they kept indoors and avoided crossing the lake at all costs.

### *2. Signs of a volcanic eruption*

Local signs from nature related to volcanic eruptions were also narrated by the informants. Still vivid in the memories of the informants were the signs they had associated with the eruption of Taal Volcano in 1965. Since then, the villagers watch out for these signs that warn them of Taal's eruption and prevent another disaster of the same proportions as 1965.

Animal signs involved dogs and birds. The informants narrated that the dogs were howling in unison on the night before the eruption. They said that the dogs were *umaalulong*. Such howling from the dogs was usually perceived as an omen of a bad event that will soon happen, not necessarily solely associated with volcanic eruptions. Moreover, unusual species of birds landed in the island and sought refuge in the roofs of their homes. They said the birds were *nakikisilong sa bubong ng bahay* (take refuge under the roofs of the houses) as if to seek protection from something that would harm them.

Different sounds were heard from the environment. They supposedly heard rumblings under the ground. They called these *naburog*. The informants described the sound as rocks falling and hitting each other from below the ground. They said that *Parang may nagbabagsak ng bato sa ilalim* (it sounded as if someone was dropping stones under the ground). They also heard unusual sounds coming from the sea and the volcano itself. Informants described these as a humming sound similar to what one hears when water gets inside one's ear when swimming or taking a bath.

The volcano itself showed signs that it would erupt. It spewed smoke prior to its eruption. The smoking volcano had probably been a majestic sight against the backdrop of extreme heat in the environment.

Another sign was the successive earthquake of low intensity. The informants noted that prior to the eruption, they already felt the tremors from several earthquake occurrences but had not paid much attention to them perhaps because they were of low intensities. They waited for announcements to come from the local volcanology office on the island.

Nena mentioned that the day prior to the eruption was uncomfortably hot and humid. The heat was worse compared with the summer months and it was already September at the time of the explosion. September was supposedly characterised by chilly winds. It was not just the environment that was unusually hot; the underground water drawn by the pumps which they drank was also unusually warm and so was the water in the lake.

### *3. Tales of visions of the supernatural as warnings about the volcanic eruption*

Besides the signs from nature, the informants also told of the visions of local residents and the tales of the supernatural that circulated among the people prior to the eruption. The informants noted that similar visions and tales are not be ignored next time but heeded and taken as omens of a major disaster.

Tasyo, one of the informants, told the tale of a vision he had prior to the eruption. He saw water lily plants grouped together drifting on the Taal Lake northwards to the shores of Talisay. He interpreted this as the plant showing people the way to safety. He said that when the people evacuated from the foothills of the crater, those who fled to Talisay were saved whereas those who travelled to other directions were hit by fire and other

pyroclastic materials so they never survived their journey.

Nanay Maria narrated another vision – a vision was of an elderly man carrying a native basket and an umbrella. He went around the island and was not a resident of the island and no one knew him. He was with a lady who was carrying a small child. They were never seen in the island before. Being a young teenager then, she was told by the elders that the old man was San Jose and the woman and child he was with were Mary and her child Jesus Christ. They were said to have roamed the island as a sign or an omen of the disaster that was to come. They did not know this then but had interpreted this after the eruption.

### *Rites and rituals to guard against disasters*

#### *1. Appeasing the spirits of the lake*

The volcano is not the only entity that people guard against. The lake itself surrounding the island is also dealt with caution. It can claim lives and some of the local residents in the community have drowned in the lake. They believe that the lake is enchanted and the spirits inhabiting the lake have to be appeased. Hence, the local people have adopted several mechanisms to cross it.

One way in which people try to appease the spirits in the lake is by throwing coins and pieces of candy on the lake for the spirits to enjoy. They believe that the spirits play with the coins and eat the candy. In this way, the spirits do not bother them. The informants also mentioned that one should refrain from *pag bati kahit may makitang kakaiba habang tumatawid* (i.e. avoid pointing out to someone or something one sees while crossing the lake). This will call the attention of the spirits to them and the spirits might take fancy on them and harm them. Nowadays, they also make sure that there is enough gasoline in the tank of the boat that would ferry them across the lake. This way, they would not run out of gasoline in the middle of crossing the lake and get stranded there for a long time. Staying for an extended period in the middle of the lake will surely give the spirits time to get to them. They also ensure that there are life jackets on board the ferry boats.

#### *2. Pagluwa*

One important dimension of guarding against disasters involved an age old religious ritual called *pagluwa* by people. The ritual involved the recitation of a prayer or *luwa* especially made for a particular devotee. The *luwa* is one of the highlights of the yearly feast in the community celebrated every 26th of December, in commemoration of the feast of Our Lady of Caysasay, the religious patron of the study site. It is one of the parts of the procession which is done on the afternoon of the feast day. In the procession, images of the Virgin of Perpetual Help and the *Mahal na Birhen ng Caysasay* (Blessed Virgin of Caysasay) are carried by the locals and are paraded in the entire community and along the lake shore. The procession is interrupted by stops along homes of the devotees or *naluwa* who recite the *luwa* particularly prepared for their personal intentions. After a round of the barangay, the procession culminates with the return of the saintly images back to the *tuklong* where they are usually kept (Figure 4).

There are known individuals within the community who write prayers for the *naluwa*. The only requirement for the writers of the prayers is that they should be skilled enough to ensure that the words of the prayer rhyme. They must be skilled in *pagtutugma* (rhyming). Kakang Peding and Kuya Kris are popular *luwa* or prayer writers in the community. Kakang

**Figure 4**

Devotees carrying the image of the *Mahal na Birhen ng Caysasay* during the April 2017 procession (©Soledad N. Dalisay, 2017. The consent of the individuals in the photo was sought to include this in the report.)

Peding has been writing prayers since 1978 whereas Kuya Kris started more recently. Both are what the people call *taong simbahan* or people of the church because of their devotion to the Catholic faith. They serve as lectors or assist the priest during mass. There is no expectation of payment for the services of the *luwa* writer. This is considered a part of his religious indulgences. Perhaps, for the *luwa* writer, the rewards are to be enjoyed in the afterlife. Both may also be considered local artisans of a sort 'weaving' prayers with locals as the medium of their craft. While the current prayer writers are men, women are not really barred from writing prayers for the *naluwa*. In fact, it is quite common for individuals, both men and women, to write their own prayers. The prayer consists of two parts; the first part relays the local lore about the virgin Mary and the community and the second part pertains to specific prayers for the safety of the *naluwa* against disasters and their personal wishes as well. A *luwa* can be used repeatedly. All of the study informants firmly believed in the power of the ritual and have attributed the absence of major disasters and strange deaths in the community to this.

Originally, the *pagluwa* was held only in December during the Feast of the *Mahal na Birhen ng Caysasay*. However, following a series of strong earthquakes experienced in the community, the ritual of the *luwa* was performed in April 2017. Lydia narrated that early in April 2017, a series of earthquakes were felt by the community members. *Nanay Ading*, a traditional healer and seer, called for a meeting with the members of the community-based organisation in charge of community affairs. She ordered to immediately carry out a procession of the images of the saints the community was taking care of. She told them of a vision she had regarding the Taal Volcano. Her vision was interpreted as an omen of an upcoming disaster. The community members feared that the disaster of 1965 would occur again. Upon the orders of *Nanay Ading*, the procession began on April 6 2017 and continued for 11 days till 16 April 2017. One of the locals performed the *luwa* at the beginning as well as the end of the 11-day vigil. It was held at dawn with almost all of the community members participating. The *pagluwa* that held in April served as a

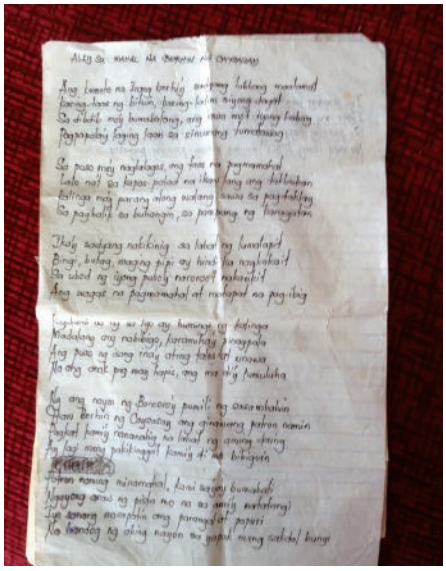

**Figure 5**

Photograph of a *luwa* used by a devotee (©Soledad N. Dalisay, 2017)

*pananggalang* or protector with the specific intention of preventing the occurrence of *sakuna* or disasters in the community. Young and old, men and women, participated in the procession. The participation of the youth in the procession is a way of ensuring its persistence. The ritual of the *pagluwa* will most likely be performed again at other times whenever the community feels another threat of a disaster. Being devoutly religious, many people in the study site have sought divine intervention as a means of coping with threats from the environment. The practice of the *pagluwa* supposedly brings them feelings of assurance that there is a supreme being who can control nature. The *pagluwa* is seen as a ritual meant to be an act of supplication towards the supernatural (Figure 5).

## HAZARDS AND DISASTERS AS OPPORTUNITIES FOR DEVELOPMENT

Perhaps, the greatest loss, besides the lives of loved ones in the 1965 eruption, was the subsistence methods and tools used by the affected people. The people had to hurriedly evacuate to save their lives and so they had very little time to gather valuables and belongings. They left their farm animals and implements. They also left their fishing gears behind. In the place where various population groups had evacuated, the evacuees had to recover and start life anew. Some stayed and established new residences and had to adjust to a new social and economic order. They lost not only the fertile lands they tilled but also the tools and other implements they needed to go back to their traditional farming and fishing methods. As a result, they had to adopt novel ways of earning a living.

All the study informants agreed that the eruption in 1965 was truly a life changing event. They lost everything they had in their homes at the foothills of the volcano. They were not able to go back to their old livelihood of farming and fishing. The schools were all covered by ashes. When they moved to new areas across Taal Lake, some went to Talisay, some to Laurel, some to Agoncillo, Lumampao and Tanauan and some to Bancoro in San Nicolas, all within the Province of Batangas. In their new homes, they experienced hardships in trying to recover their losses. Life at the foothills of the volcano had been easy for them. They were blessed with abundant harvests from the fertile soil and a bounty catch from the lake. The informants mentioned that at the foot of the volcano, they did not need to exert much effort because food was abundant and easy to get. Nature had been kind to them and thus they did not aspire for a better life. They were content with only elementary education because there was no need for higher education to survive in their small town by the volcano. Moving away from the volcano, however, they were forced to compete with the locals in the area which they now considered their new home and work places. They began realising that they needed to develop skills and knowledge for surviving in the new environment. With their current skills and know-how, they simply could not provide for a decent life for their families. Hence, they started to consider other livelihood options. At about this time, the Philippines had adopted overseas employment as a stopgap economic strategy to stem the growing problem of the lack of available jobs for its citizens. Engineers and healthcare providers were going abroad for lucrative, better paying jobs. This had been a strategy particularly adopted by some of the families that had evacuated Taal. The informants had relatives who had migrated to countries abroad for greener pastures and fared well. They were able to find appropriately paying decent jobs in Spain, Austria and other European countries. More and more of the townsfolk were being recruited by relatives working abroad. The succeeding generations had aspired to earn university degrees for job placement abroad. The small town soon became known as a town of where most families had at the least one member who was a contract worker abroad.

While not all of those who went abroad had been lucky, there were enough successful community members to sustain the aspiration for overseas work. With the remittances, they were able to build concrete homes, send their children to school and afford small luxuries such as electronic gadgets and imported branded clothing. With time, the small town progressed. Thus, one of the study informants articulated the view that the 1965 disaster particularly had brought them *swerte* or good luck. In her view, the disaster had brought them an opportunity to improve the lives of the people in her town.

Some of the study informants narrated that after the mass evacuation of residents from the foot of the volcano in 1965 after the explosion, some of their neighbours in the island had returned to their old homes in the island in spite of warnings from the local volcanology office and advice that they permanently move to safer grounds. In an effort to force the residents to evacuate from the danger zone, the local government allegedly refused persistent requests from the residents to build a school on the island to allow their children access to education without moving out. The local government had not been successful here. From the perspective of the implementers of government programmes, people's refusal to leave reflects obstinacy and made it difficult for DRRM personnel to evacuate them from hazard zones. The study informants claimed that the people who chose to stay in the island believed in their local knowledge of the volcano. They claimed to know the signs and were prepared to evacuate at the slightest indication of a volcanic eruption. The informants shared that the people in the island relied on the fertile soil in the island and the abundant fish in the lake for their subsistence and do not know of any other way of life. For them, living within the danger zone of the volcano was a better option. After all, how often does the volcano explode? They would much face a future with the risk of an occasional volcanic explosion rather than face the present with hunger if they live outside of the sphere of their traditional subsistence zones.

## MECHANISMS OF SOCIAL COHESION CONTRIBUTING TO DRM

One aspect of the community that was viewed as essential to DRRM was that almost all of the community people were related either by blood or marriage. This contributed to what they referred to as *pagkakaisa* or unity. Moreover, the elders enjoyed respect and the young were likely to follow their orders. Hence, it was easy to implement sound DRR practices that elders approve of. It seems that strong familial bonds transcend the household and contribute to community DRR efforts. Being in the company of relations also ensured that their social safety net was in place during times of hardships or disasters. In this small community of a little more than 2,000 individuals, everyone claimed to look after each other. This sense of community has contributed immensely to disaster preparedness, recovery and resilience.

Apparently, because of the strong sense of community, it had been easy to organise people to inform each other of preparedness measures such as disseminating vital information on the coming of a typhoon, for instance. Each member took it upon themselves to inform their relatives and neighbours. There was a community based people's organisation that made the dissemination of information systematic. Thus, when the need to conduct an impromptu *pagluwa* in April 2017 was deemed to be necessary by the community organisation, enjoining everyone's participation in the ritual had not been difficult. Helping each other, especially relatives, after a disaster had also been exemplary among the people of the community. Relatives very readily accepted into the homes of their relatives who

had fled from the island during the explosion of 1965. They had been taken care of, both materially and in terms of the provision of emotional support during the recovery period. Hence, all of these had built upon the people's resilience.

## SUMMARY AND CONCLUSION

The study informants living in a small community in Batangas, narrated their experiences of hazards in their environment. Living in close proximity of the crater of the Taal Volcano, the study informants regarded the volcano with ambivalence. On one hand, they feared the volcano because of the potential destruction and loss of lives that a volcanic eruption could bring. On the other hand, they the enjoyed the fertile soil as well as the abundance of resources on the lake surrounding the crater; hence, they were hesitant to leave the vicinity of the crater. Moreover, the volcano has become an important tourist attraction generating jobs for the locals. As a tourist attraction, it has also become a source of pride because their small community has become known among international tourists and it has been listed in tourist guide books. In the process, they faced risk and danger in the event of a volcanic explosion. Another hazard commonly faced by the people is typhoons. In fact, typhoons were more commonly experienced than volcanic eruptions since the entire country of the Philippines is normally visited by 20 or more typhoons in any given year. However, for the study informants, the volcano was considered a more significant hazard because of its potential to be more damaging to life and property.

The study informants had shared some of the domains of ICH that had been particularly helpful in their efforts to prepare and recover from their encounters with hazards. In particular, they told of local knowledge in the form of signs from animals such as dogs and birds, unusual sounds from the ground and the lake and folk tales about the supernatural that warned them of an upcoming typhoon or volcanic eruption. They also possessed animistic beliefs about spirits in the Taal Lake and performed rites and rituals in which they believed so as not to displease the spirits which in effect, prevented disasters from happening. The study informants, likewise, exhibited resilience in their willingness to adapt to the environment by innovation in their rituals. The holding of the *pagluwa* outside of its usual religious calendar reflects this. Moreover, the strong sense of community among its members had also been a vital factor in their preparedness, recovery and resilience.

It is important to point out that from the perspective of DRRM programme implementers, the community's environment is a hazard zone and all communities residing therein must be evacuated to avoid disasters. From the perspective of the community members, however, this zone is also a zone of opportunities for social and economic development. Hazards had been a part of the study informants' everyday lives. Every day in their community comes with the risk of a volcanic eruption or a typhoon. They live every day coping with this possibility using various forms of ICH shared by the study informants in this study. The local knowledge they had, the rites and rituals they performed, the tales they retold to the younger generations, as well as the way they organised themselves as a community composed of relatives, friends and neighbours allowed the people to carry on with their lives and live as resilient communities in their environment even with the constant threat of hazards. With these contrasting perspectives, it is vital that the community and DRRM planners sit down and discuss the viable courses of action that would enable people to live in safe, hazard free environments that support their ways of earning a living. Because of the important role of ICH in how people engaged with hazards

in their environment, it would be wise for DRRM planners to incorporate some elements thereof, in the work that they do. For instance, knowledge in volcanology and meteorology can be framed through the people's local knowledge. Conversely, local knowledge could be explained through the principles of volcanology and meteorology. Risk information can be disseminated using the local language for better understanding by the people. In doing so, one may realise that what was once considered as two different knowledge streams are actually not mutually exclusive after all.

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# ICH AND NATURAL DISASTERS IN BLACK HÀ NHÌ AND RED DAO COMMUNITIES IN LÀO CAI PROVINCE, VIETNAM

Phan Phương Anh[1] and Vũ Cảnh Toàn[2]

## INTRODUCTION

On the morning of 10 August 2008, I received a phone call from Dr Trần Hữu Sơn, Director of the Department of Culture, Sports and Tourism (DCST) of Lào Cai province at the time. With a very emotional voice, Dr Sơn announced the death of the 'whole Tùng Chỉn village' of the Red Dao people by a flash flood, which had occurred the night before, burying and washing away 19 houses and killing more than 20 people. I first met Dr Sơn about a year ago while, with three other colleagues from the Vietnam Institute of Culture and Art Studies (VICAS), we were visiting the region to collect data for a small research project on the application of indigenous knowledge on agricultural production in the Bát Xát district (Lào Cai province). In fact, I had conducted fieldwork in the next village (Phìn Ngan), situated about 5 km from Tùng Chỉn village at a higher altitude. Phìn Ngan did not have any human loss, but most of the paddy fields and crops were damaged, as with many other villages in the Trịnh Trường commune. Although I had learned of this news from the media before his call, I cannot describe how shocked I was when Mr Sơn called me from the site of the disaster, as my memories of the scenic landscape of the region and its wonderful people were still so fresh. He immediately raised the question about the link between the affected individuals' livelihood and the disaster. This question has followed me for many years.

The same village, Tùng Chỉn, was affected nine years later, on 26 August 2017, by another flash flood that damaged five villages in the Trịnh Tường commune. This was a small event compared to the 2008 flash flood. However, one man in this village was washed away (he was later found about 20 km away in the Red River), about 60 heads of livestock were killed, and a dozen hectares of rice fields and crops were damaged (Phương Liên, 2017). These events raise many questions, including the following:

- What is the relationship between flash floods and the livelihood (i.e. wet-rice culture in terraced rice fields) of the Dao people in mountainous areas?
- Why are the Dao people in Bát Xát more vulnerable to flash floods as compared with their neighbours, such as the Black Hà Nhì community?
- What is the link among the Dao people's knowledge, livelihood and vulnerability to natural disasters?

1 Department of Anthropology, University of Social Sciences and Humanities, Vietnam National University, Hanoi.
2 Institute for Social and Environmental Transition-International in Vietnam (ISET-Vietnam), Hanoi.

This project provides an invaluable opportunity to conduct a survey on intangible cultural heritage (ICH) preservation, disaster risk management (DRM) and disaster risk reduction (DRR). We compare the knowledge, livelihood practices and vulnerabilities of two ethnic communities (the Red Dao and the Black Hà Nhì) living at the same altitude in Lào Cai province to help elucidate the role of ICH in the DRM/DRR process. Although the focus is on two districts, including Bát Xát and Sa Pa, which have been highly exposed to natural hazards, and where there is a high concentration of these two ethnic groups, we also provide some background information about the DRM structure and process on a broader scale (i.e. at the provincial and national levels). In addition, relevant examples from other parts of the province are cited to illustrate the story.

## OBJECTIVE

The overall objective of this report is to assess the current condition of ICH at the local level in relation to natural hazards. The concrete objectives of the study are as follows:

- Understand the DRM body, planning and current practices at the provincial/district/communal levels and the place of the cultural sector in this process
- Examine the importance/significance of ICH in the process of DRR in mitigating the impact of natural disasters
- Understand the impact of natural disasters on ICH
- Identify non-climate factors influencing the safeguarding of ICH, and thus the vulnerability of ethnic community groups to natural disasters, and identify gaps in ICH management in relation to DRR/DRM

## METHODOLOGY

The main methods used to prepare this report included the following:

- Primary data collection about ICH in the Black Hà Nhì and Red Dao communities in the Bát Xát district from 2007
- Secondary data collection of documents, including ICH- and DRM-related polices and plans, government reports, project reports, academic literature, online newspapers and government websites
- Document review and analysis
- Interviews with ICH and DRM researchers, government officials leading ICH and culture management in Lào Cai, as well as DRM practitioners

## UNDERSTANDING THE LOCALITY AND COMMUNITY SITUATIONS

### Basic Information on Lào Cai Province

#### *Natural conditions (geographical position, topography)*

Lào Cai province is located in the mountainous northern region at the highest elevation zones of Vietnam. The province shares its borders with China in the north and other provinces, including Hà Giang, in the east, Lai Châu in the west and Yên Bái in the south. The region has a total area of about 6,384 $km^2$ (LSO, 2015) and had a population of 684.3

thousand people in 2016 (Lào Cai Gov, 2016). The province is divided into nine administrative units, including Lào Cai (the capital of the province) and eight rural districts (Mường Khương, Bát Xát, Bắc Hà, Bảo Thắng, Sapa, Bảo Yên, Văn Bàn and Si Ma Cai), with 164 communes and wards (Lào Cai Gov, 2016). However, the most important economic, political, cultural, social and educational activities and critical urban infrastructures are concentrated in Lào Cai. Located less than 300 km northwest of Hanoi at the gate of the Kunming (China)–Lào Cai–Hà Nội–Hải Phòng economic corridor, Lào Cai plays an important role in connecting Vietnam and member states of the Association of Southeast Asian Nations (ASEAN) countries with Yunnan and the southwest region of China.

Lào Cai province has a complex and highly diverse topography, with three types of terrain, including: (i) high mountainous and a hilly terrain with elevations above 1,500 m, accounting for about 21% of the province's natural area. This terrain covers most districts in the eastern flank area of the Hoàng Liên Sơn range in the Bát Xát, Sa Pa and Văn Bàn districts and is the highest part of the Bắc Hà district. The high elevation level makes this area the most remote and difficult to access and thus is among the least developed (Lào Cai Gov, 2016). People living in this part of the province face challenges of water scarcity and extremely low temperatures; (ii) the middle-level mountains with elevation levels between 700 m and 1,500 m, covering up to 35% of the total provincial area and distributed in districts belonging to the Hoàng Liên Sơn range, including Bát Xát, Sa Pa and the highland area of Bắc Hà; and (iii) low mountains and alluvial terrain located along rivers with elevations below 700 m, covering about 43% of the province's total natural area. Cities along the Red River and Chảy River, including Lào Cai, Cam Đường, Bảo Thắng, Bảo Yên and the east side of the Văn Bàn district are located at lower elevations, with less challenging topography, granting more convenient access to transport, markets, production activities and services. The less dangerous and less steep terrain with fields and valleys are more favourable areas for agriculture and forestry production or construction of infrastructure development.

The majority of areas in the province are about 300 m above sea level, with the highest mountain peaks reaching over 3,000 m above sea level (Fansipan is the highest peak in Vietnam at 3,143 m above sea level, followed by Tả Giàng Phìn at 2,850 m) (LSO, 2015).

***Environment and population***

Lào Cai province is largely covered by forests that account for up to 52% of the province's total area (LSO, 2015). The province also has rich and varied types of mineral resources, among which the most valuable include copper, molybdenum, apatite and iron. The water resources of the province are provided by roughly 107 streams (LCPPC, 2017). The main river in Lào Cai is Hong River (Red River), which originates in China and flows towards the Ha Noi, Nậm Thi and Chảy Rivers.

Lào Cai has 13 main ethnic groups (Trần Hữu Sơn, 2017).[3] The most important groups in number are the Kinh (35.9%), H'mông (22.21%), Tày (15.84%), Dao (Yao in Chinese) (14.05%), Giáy (4.7%), Nùng (4.4%) (Lào Cai Gov, 2016) and other smaller groups, including Phù Lá, Sán Chay, Hà Nhì, La Chí, Bố Y, Hoa, Mường and Thái. At the communal level, the population is comprised of different ethnic groups or sub-groups, but at the village level,

3 The province has 25 different ethnic groups in official statistics. However, some groups count only a few people or only one family and do not constitute a cultural community (Trần Hữu Sơn, 2018).

there is usually only one ethnic group (Trần Hữu Sơn, 2017).

In addition to an important number of Kinh people[4] who work in administration, services and businesses in valleys and lowland areas, most of the population lives off of rice planting and forest exploitation. Different ethnic groups living at various altitudes have distinctive farming practices according to the geographical area. In the valleys and along rivers and streams (from about 100 m to 400 m above sea level), rice fields and crops usually belong to the Kinh, Tày, Thái, Nùng and Giáy peoples. The ethnic groups have some narrow rice fields along streams in the Mường Khương, Bắc Hà, Bảo Yên and Bảo Thắng districts but also have larger rice fields along the Red River in the Bát Xát district. From 700 m to more than 1,000 m, there is one group of Xà Phó (a branch of the Phù Lá group) and some branches of the Dao people (Dao họ, Dao Làn Tiẻn). They live near water sources and cultivate terraced rice fields. At more than 700 m to 800 m above sea level, there are three main groups: the Hmông, Hà Nhì and Dao. They work terraced rice fields when they can find water sources. Otherwise, they practice shifting cultivation and forest exploitation.

### *Climate and natural hazards*

The two seasons in Lào Cai are the rainy season, from April to September, and the dry season, from October to March of the following year. The province can be divided into two climate regions: i) above 700 m: the annual average temperature ranges from 15°C to 20°C, and annual rainfall is about 1,800 mm to 2,000 mm; and ii) the lowland region: temperatures vary from 23°C to 29°C and rainfall from 1,400 mm to 1,700 mm (LSO, 2015). A high degree of variation exists between regions and seasons. For instance, in some elevated mountainous areas in the Mường Khương and Bát Xát districts, the average annual temperature is 15°C, while it is about 22.8°C in Lào Cai. Similarly, nearly eight degrees of difference in the average temperature of the coldest month (i.e. May) exist between Sa Pa and Lào Cai. The precipitation variation is likewise significant between areas. For example, the annual precipitation in the east flank area of the Hoàng Liên Sơn range, such as the southeast Si Ma Cai district, Bảo Yên district and northeast of the Bắc Hà district, is greater than 2,500 mm, while it is only 1,700 mm in other areas, such as the Mường Khương and Bảo Thắng districts and Lào Cai (LSO, 2015).

Regarding natural hazards, as a mountainous province characterised by high and sloping terrains, Lào Cai province has suffered various types of hazards, such as flash floods, landslides, inundation, lightning, thunderstorms, tornadoes and extreme cold temperatures and heat waves. Among these, flash floods and landslides are considered the most dangerous. Additionally, fog and frost are common phenomena in the province, especially during winter (Lào Cai Gov, 2016). The most vulnerable populations are ethnic minorities living in high altitudes. The present study focuses on two groups, the Black Hà Nhì and the Red Dao peoples, and we limit our investigation to the two districts of Bát Xát and Sa Pa, where these groups, with the Hmông group,[5] form the majority of the population at high altitudes (more than 700 m above sea level). The natural area of these districts (with the Văn Bàn district to the south) is on the eastern flank area of the Hoàng Liên Sơn range and limited on the west by the highest part of the mountain range, which is also the natural border with Lai Châu province and on the east by the Red River. In recent years, this area

4 Kinh people represent more than 80% of the Vietnamese population.

5 In this report, we exclude investigation of the Hmông group.

has had the highest incidence of flash flooding and landslides as well as damaging cold temperatures and droughts (see the following section).

## Studied Communities: the Black Hà Nhì, Red Dao people in the Bát Xát and Sa Pa districts

The Hà Nhì and Dao peoples were some of the first inhabitants of the region (Đặng Nghiêm Vạn et al., 2000). Both ethnic groups originated in China and immigrated to Vietnam at least 200 years ago. Hà Nhì is a small group (under 5,000 people) that settled only in Bát Xát. The Hmong and Dao are the largest groups in these two districts. The total population is 75,145 people for Bát Xát and 59,214 for Sa Pa (LSO, 2015).

### *The Hà Nhì community*

The Hà Nhì population in Vietnam numbers 21,725 (GSO, 2010) and is divided into two branches: the Hà Nhì Hoa (Flower) and the Hà Nhì Đen (Black), according to their traditional customs. These branches belong to the Sino-Tibetan language group. In Vietnam, they settled mostly in the Lai Châu, Lào Cai and Điện Biên provinces. In Lào Cai, there are 4,026 Black Hà Nhì people settling in the Ý Tý, Nậm Pung, Ngải Thầu, A Lù and Trịnh Tường communes of Bát Xát. Hà Nhì people in Vietnam migrated from Yunnan about 300 years ago (Chu Thuỳ Liên, 2004).

### *The Red Dao people*

The Dao population in Vietnam numbers 751,067 (GSO, 2010). This population belongs to the Hmông-Dao language group. In Lào Cai, the Dao people are divided into three sub-groups: the Red Dao, Dao Tuyển (of Dao Làn Tiẻn) and Dao Họ (Dao Quần Trắng, 'white pants') (Trần Hữu Sơn, 2017). They live in 114 communes in Lào Cai in the Bảo Yên, Bảo Thắng, Bảo Yên and Bắc Hà districts. The Red Dao represent 66.7% of the Dao people in Lào Cai, and most of the Dao people settled in Sa Pa belong to this group; Bát Xát contains both the Red Dao and Dao Tuyển groups. They form the second largest group in Bát Xát and Sa Pa districts, closely following the Hmông people. In Bát Xát, the groups represent 26.73% of the population in the district, which is equivalent to 3,277 families and 17,599 people, present in 17 out of 23 communes and wards. In three of them (i.e. Tòng Sành, Dền Sáng and Phìn Ngan), the groups form the totality of the population (Phan Phương Anh, 2008). In Sa Pa, the groups represent 23.04% of the population (Sa Pa Gov, 2017) and are concentrated in Bản Hồ, Bản Phùng, Tả Phìn, Tả Van and Thanh Kim. Most of the individuals belong to the Red Dao group. Dao people in Vietnam came from Yunnan during the eighteenth century (Nguyễn Trường Giang, 2015).

Living at the same altitude, these two groups have the same type of livelihood: forest exploitation for essential needs (firewood, housing, picking and hunting) and wet-rice farming. However, the Black Hà Nhì have developed terraced rice fields for hundreds of years, whereas the Dao people have a long tradition of swidden cultivation, though they have changed more and more to wet-rice cultivation in the last decades. Each group has similar and dissimilar behaviours towards the ecological environment that triggers different degrees of vulnerability to natural disaster.

## DRM Structure and Process in Vietnam and in Lào Cai Province

### *The DRM process in practice, a top-down approach*

In Vietnam, the DRM system has been dominated by a top-down approach. A system coordinated and led by the Central Steering Committee for Natural Disaster Prevention and Control (CSC-NDPC) has been established from the national level to the commune level (see Figure 1). The CSC-NDPC is a multi- and cross-sector agency headed by the Minister of Agriculture and Rural Development (Minister of Agriculture and Rural Development, 1999), with members as senior leaders of relevant national level agencies/ministries. The same structure is applied at the provincial and district levels. The ministry of culture and department/division of culture (i.e. agencies in charge of cultural heritage management) at the local level are members of national and provincial/district committees. However, they often have limited roles in the disaster planning processes. At the commune level, in addition to the government officials, heads of villages are also mobilised and appointed as members of the Commune Committee. The national committee is responsible for organising and directing all important activities linked to natural disaster prevention and control. The CSC-NDPC also guides and supervises ministries and provinces in the building and implementation of action plans, projects and programmes on DRR. Additionally, the CSC-NDPC plays an important role in mobilising financial resources to support recovery activities.

Regarding the disaster planning process, every spring, the CSC-NDPC develops a national DRM plan and a detailed report containing two components. The first component focuses on reviewing all disasters that occurred in the country in the previous year and actions taken and experiences of dealing with those disasters, as well as lessons learned for the

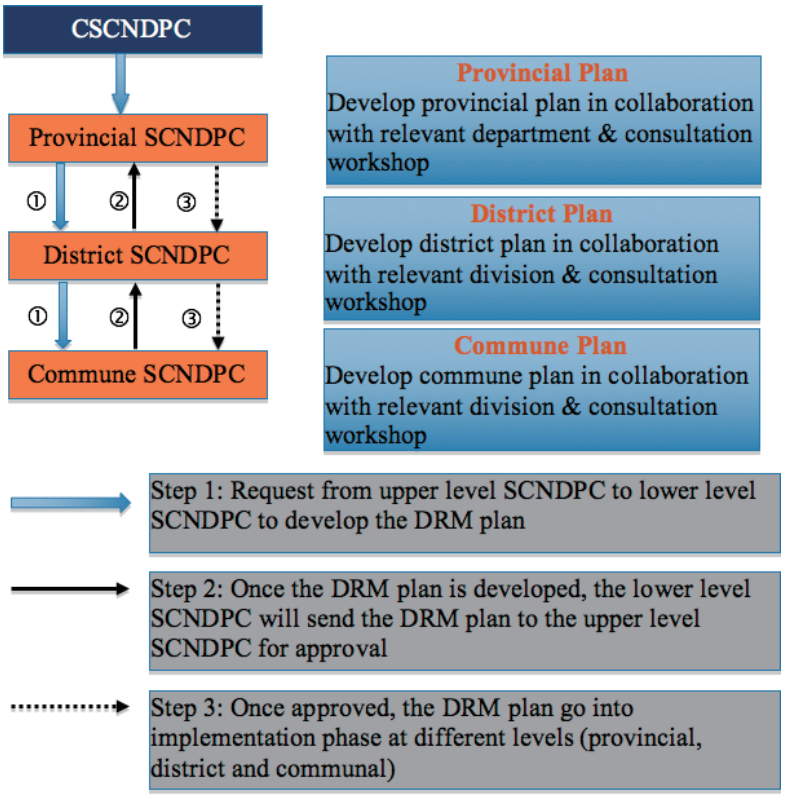


**Figure 1**
Traditional disaster risk management planning (Adapted from Bach Tan Sinh et al., 2013, p. 48)

coming year. The second component specifies the future forecast of natural disasters in the coming years, identifies the main risks and proposes approaches and plans to reduce these risks. These documents serve as main guidelines for the Provincial Committee for Natural Disaster Prevention and Control to develop provincial-level reports and plans. The same procedure is applied to the district and commune-level committees, and each step follows roughly the same template as those at the national level (see Figure 1 for the entire process, from the national to the commune levels).

In these conventional disaster management planning approaches and practices, community and other related stakeholders have limited opportunity to participate. They are only consulted when draft DRM plans have already been developed. Additionally, the guidelines from higher level agencies are often perceived as strict guidance that must be followed by lower levels and thus does not encourage feedback. Furthermore, most decision making and budgeting power is in the hands of the national and provincial levels. The district and commune levels only have a small role in the implementation phase.

***DRM planning in Lào Cai province***

Traditionally, the disaster management and planning in Lào Cai applies the same approach as mentioned above. However, recognising the limitation of the conventional top-down planning and the values and knowledge of local peoples obtained from a long tradition of coping with national disasters, the Community Based Disaster Risk Reduction (CBDRM) Program was approved by the national government in 2001. The enactment of this programme has promoted a bottom-up DRM planning approach. Specifically, the CBDRM approach places community needs and knowledge at the centre of DRM practices. Thus, a disaster planning process starts at the community (i.e. village and commune) level instead of the national level. Once completed, commune disaster management plans serve as inputs for the preparation of the district plan. In turn, the district plans contribute to the development of provincial plans. Since 2008, 23 provinces frequently affected by natural disasters, including Lào Cai, have implemented the CBDRM policy (Bach Tan Sinh et al., 2013).

## IDENTIFYING KNOWN NATURAL HAZARDS AND RISKS IN THE AREA

*Natural disasters* are defined by the *Law on Natural Disaster Prevention and Control 2013* (LNDPC) as 'abnormal natural phenomena which may cause damage to human life, property, the environment, living conditions and socio-economic activities' (Art. 3), and include:

> typhoons, tropical low pressure, whirlwinds, lightning, heavy rain, floods, flash floods, inundation, landslides and land subsidence due to floods or water currents, water rise, seawater intrusion, extremely hot weather, droughts, damaging cold, hail, hoarfrosts, earthquakes, tsunamis and other types of natural disasters (SRV, 2013).

### Varieties of Natural Hazards (Types, Severity, Frequency)

Lào Cai is exposed to many of the disasters listed above by the LNDPC. The most damaging elements from this list include landslides, flash floods, whirlwinds, lightning, heavy rain, floods, hail, hoarfrosts, damaging cold and droughts (LCPPC, 2017).

**Flash floods** *(lũ ống, lũ quét)*: as explained above, the natural topography of Lào Cai embraces two large mountain ranges, the Hoàng Liên mountain range in the west and the Elephant Range in the east, with divided terrain, steep slopes, many valleys and deep streams. Floods associated with mud and rocks often lead to **landslides**. The most affected districts include Sa Pa, Bát Xát, Văn Bàn and Mường Khương, with 7 points identified for flash floods and 445 points for landslides in 2017. Particularly, the 71 points for landslides identified in Bát Xát are at the highest level of rock and mud quantities (LCPPC, 2017). They occur from June to October and are especially strong from July to September.

**River floods** *(lũ sông):* roughly four to five heavy rainfalls occur every year, with more than 100 mm each time. Rainfall can combine with converging water from upstream in China and the small streams in the surrounding areas to cause river flooding. However, the water withdraws quickly. The most significant damage is to agricultural production along the riverside. The affected zones include the Bảo Yên, Bảo Thắng and Văn Bàn districts, Lào Cai and the communes in the lowlands of the Bát Xát and Mường Khương districts.

**Whirlwinds** *(lốc xoáy)*, **hail** *(mưa đá)* and **lightning** *(giông sét)*: these events occur from March to June, accompanying storms and rainfall. Many whirlwinds of level seven and eight appear in Mường Khương, Bát Xát, Bắc Hà, Si Ma Cai and Bảo Yên. The frequency of whirlwinds is roughly 10 to 15 times per year, lightning 20 to 30 times per year (accompanied by rainfall and whirlwinds) and hail 2 to 3 times per year.

In addition, there are types of slow-onset hazards, such as **drought** *(hạn hán)* and **cold weather damage** *(rét đậm rét hại)*, which do not have direct impacts on infrastructure but seriously affect the livelihoods of the people dependent on livestock, poultry, rice fields and crops. Drought can happen during the periods after March to April or after October to November. Severe droughts occur every 20 to 22 years. However, since 1980, extreme droughts are much more frequent. For instance, five substantial droughts were recorded from 1983 to 1999 (late 1983 to early 1984; 1985 to 1986; 1990 to 1991; 1993 to 1994; and 1998 to 1999) (Lào Cai DARD, 2015). The most recent event was in April to May 2014, during which nearly 2,000 ha of rice fields and crops were damaged.

Cold weather damage occurs from December to February of the following year, affecting mostly the Sa Pa, Bát Xát, Si Ma Cai, Bắc Hà, Văn Bàn and Mường Khương districts. The damage mostly affects livestock and human health (see below).

### *Influence of Climate Change*

Lào Cai has low exposure to natural disasters compared to provinces in other parts of Vietnam, such as the central region and the Mekong Delta (Mai Thanh Sơn et al., 2011). Therefore, intervention and support of climate change adaptation for the population in the province has received less attention than the regions listed above. This also explains why the region has received less attention in academic research and why fewer project reports have been produced on Lào Cai's relation to climate-related risks. Recent research shows that over the past several years, the sum total loss of human life and material goods in the Mekong Delta is definitively higher than in the northern mountainous area; however, when we look more closely at the proportion of the loss of total revenue and population, the loss in the northern mountainous region is not less and maybe even more significant than in other parts of the country that are more exposed to climate change (Mai Thanh Sơn et al., 2011). Since 2008, the situation has changed due to the extreme events of those years

(see below). Climate change and natural disasters are identified as major causes of poverty in the population among the ethnic minorities in the northern mountainous region, and during recent years, the region has been more prone to climate change exposure due to the growing number of extreme weather events. Additionally, the population's heavy reliance on agricultural livelihoods that are highly susceptible to changes in weather increases their vulnerability. Additionally, the high sensitivity of the northern mountainous region in general, and of Lào Cai province in particular, to climate change is rooted in the region's main social vulnerabilities. For instance, communes in Lào Cai have the lowest per capita income, and the province has the highest population density compared with other provinces in the northern mountainous area (Trang Do et al., 2013). Lào Cai also has high illiteracy rates, large families among ethnic minorities and low rates of female education (World Bank, 2010; McElwee, 2010; Trang Do et al., 2013).

## History of Recent Disaster Events that have Affected the Community

### *Some typical flash flood and landslide events in Lào Cai*

Flash floods and landslides are the most common disasters registered in Lào Cai (Nguyễn Trọng Yêm, 2006). Over the past 20 years, in the area populated by the Dao people, including Bát Xát, Bắc Hà and Sa Pa, more than 40 severe flash floods and landslide events occurred (Trần Hữu Sơn, 2017). Below are some examples of the extreme events and their impacts:

- On the evening of 13 September 2004, in the Sùng Hoảng village, Phìn Ngan commune, Bát Xát district, a major landslide after heavy rainfall buried 4 families out of 23 Dao people. In 2004, in total, Lào Cai province lost 38 people, 5 were injured and 58 houses were destroyed and washed away.
- On the night of 8 August 2008, heavy rainfall over a large area led to flash floods, landslides and inundation in many locations of the province. A flash flood with mud and rock, considered to be the largest flash flood in the history of Lào Cai, killed 66 people (missing and dead). The majority of the main roads were blocked, local water supply works were destroyed and many buildings, houses, paddies, etc., were heavily damaged. Hundreds of hectares of rice and vegetable fields in the Trịnh Tường commune were lost and washed away. In particular, the flood of mud and rock wiped out the village of Tùng Chỉn (in the Bát Xát district) and buried and washed away 22 people (Trần Thục and Koos Neefjes (ed.), 2015).[6] In total, the flood season has killed 103 people in the province (76 dead and 27 missing), collapsed and damaged 904 houses, with 1,626 other houses damaged slightly, while 2,206 households had to move out of dangerous areas. 5,415 ha of rice fields and crops were damaged. Other losses in infrastructure were also significant. The total loss caused by natural disasters for 2008 (including the heavy loss in livestock caused by damaging cold in the beginning of the year, see below) is estimated to be 1,024 billion Vietnamese Dong (VND) (Lào Cai DARD, 2008).
- In August 2012, due to the influence of a tropical depression combined with the convergence of high winds, the eastern districts of the province had an average rainfall of more than 45 mm, particularly in the area of Bắc Hà, and local rainfall

6 The number of dead is not the same according to different sources: they number 24 according to Trần Hữu Sơn (2017), and many electronic newspapers state 19 people.

totalled more than 200 mm and lasted for several hours. On the night of 31 August 2012, a severe flash flood swept through the residential area of the Nậm Lù and Nậm Cang villages and the Nậm Lúc commune in the Bắc Hà district and killed 11 people, injured 10 and washed away 12 houses of Dao people (Trần Hữu Sơn, 2017). The flood flattened 10 ha of land, paddy fields and gardens. More than 6 km of inter-village roads near Nậm Lúc village were completely paralysed and buried under tens of thousands of cubic metres of rock and mud; the wireline communication network was damaged, and contact between the affected village and the provincial steering Central Committee for Flood and Storm Control (CCFSC) and Search and Rescue (SAR) had to rely entirely on unstable mobile phone connections (Trần Thục and Koos Neefjes, 2015).

- A very recent event occurred in August 2016: the influence of storms (number 1, 2 and 3 from July 27 to August 5 and from August 18 to 20), caused whirlwinds, lightning and heavy rainfall (with an average rainfall of 100 to 152 mm and 160 mm in some areas on August 5). This triggered flash flooding and a landslide that killed 27 people (missing and dead) and injured 14. There were 1,558 houses damaged. 530 houses were evacuated during the storms. The event caused 10,599 ha of paddy fields and crops to be destroyed and flooded. The event also caused 10,980 cattle and poultry to be killed and washed away. The total loss in agriculture is estimated to be more than 200 billion VND. Seven suspension bridges were washed away, and 40 others were damaged; many locations on national roads 279, 4D, 32, provincial roads 151, 152, 153, 154, 156, 157, 158, 159, 160 and many district, communal and village roads were damaged and flooded out; 5 small hydropower dams were damaged; 14 schools were damaged; the water supply system was damaged for eight communes, and the Phìn Ngan commune was without electricity for many days. The total loss is estimated to be more than 680 billion VND.
- The two districts mostly affected were Bát Xát and Sa Pa, with 11 people killed (dead and missing) and 7 injured. Once again, a Dao village, Sùng Hoảng 2 (in the same area of the 2004 event) was destroyed, with 3 people killed and 16 houses washed away. Some other villages have been evacuated, including Van Hồ (34 houses) in the Phìn Ngan commune, Bát Xát district (LCPPC, 2016). They all belong to the Red Dao people.

### *Recovery, difficulties and challenges*

After flash floods and landslide events in the past, Lào Cai authorities have provided a significant amount of support to affected people; however, in remote areas with limited access to resources, people are forced to rely on themselves post-disaster. Therefore, organisation of post-disaster recovery under the 'four on-the-spots' motto (leadership on the spot, human resources and forces on the spot, materials and logistics on the spot) is very important. Government efforts focus on SAR, restoring infrastructure (roads, schools, medical centres, etc.) and relocating affected people. Support from the government also includes money for damaged households and for food and water for people in flooded zones and agriculture seed for affected farming families. People have to rebuild their own lives. For the Dao people who have lost their houses, they are usually relocated to a safer place that is chosen by local authorities. One of the most significant challenges is restoring their livelihood, as the productive land is reduced or as people are relocated far from their homeland. For example, one year after the 2016 flash flood in Bát Xát, the village of Sùng

Hoảng 2 was totally rebuilt with 35 households (about 180 peoples) in a new settlement on top of a hill 10 km away from the older location. In July 2017, these individuals still did not have electricity, clean water or a road to connect them to other facilities and villages. In particular, there were no water sources in the new location to develop rice fields, and as a consequence, about a dozen families rebuilt shelters in the older village to be able to work in the fields. This, again, makes them vulnerable to flash flooding in the future. Only a few families stayed in the new settlement, most of whom consisted of the elderly and children (see Figure 2 in the following section).

***Historical freezing and the damaging cold event of 2008***

The historical freezing and damaging cold event that lasted for 38 days, from 15 January to 21 February 2008, was an historic event in the Northern Delta and Midlands and led to very serious damages and losses. During this cold event, the minimum temperature dropped to record lows in Sa Pa of -1.6°C (on February 14). Ice, snow and frost lasted for many days in high mountainous areas of Lào Cai, such as in Bát Xát, Mường Khương, Bắc Hà, Si Ma Cai and Sa Pa. This year experienced the longest duration of damaging cold and the largest areas of ice and snow on record in Vietnam. The losses recorded in Lào Cai were the most severe compared with other provinces, including 18,760 livestock, and most of the winter/spring rice and crops were lost (Lào Cai DARD, 2008).

*Recovery, difficulties and challenges*

Researchers have pointed out that local authorities in many areas usually pay less attention to slow-onset hazards such as damaging cold. However, the Dao and Hmong people rely heavily on agriculture and free-feeding practices (for livestock and poultry), which are strongly affected by extreme and extended cold events. As a consequence, once they happen, these events often cause serious damage (such as loss of cattle, horses and vegetables) for local communities and thus make their poverty reduction efforts much more challenging. Recognising this problem, after the historical cold event in 2008, the Vietnamese government made an immediate decision to provide support and compensation to the affected regions. The government has also engaged in efforts to raise awareness and build capacity for local communities so that they can better prepare for and cope with cold weather events.

***Droughts and wildfires***

A historical wildfire event started on 8 February 2010 (25 of Lunar New Year), in the Tả Van commune, Sa Pa district and reached the forest core zone of Hoàng Liên National Park (Hồng Hà, 2010). Officially, the fire ended on February 15, but in some areas, the fire lasted for a month (Lãng Quân, 2010). This extreme wildfire happened after several months of drought and had very severe consequences: about 3,000 ha (even more, according to Trần Hữu Sơn (2018)) of forest were burned. Three communes (of the six affected) belong to the Lào Cai province: Tả Van, Bản Hồ and Lao Chải – areas of Hmong and Red Dao people.

In 2014, a long drought triggered by many prolonged heatwaves from May to September caused a loss of 13,589 ha of paddy fields and crops in Mường Khương, Si Ma Cai, Văn Bàn, Bảo Thắng and Sa Pa (Lào Cai DARD, 2015).

*Recovery, difficulties and challenges*

Heat waves and drought cause serious consequences for the livelihood of local populations. They also increase the danger of wildfires, which require only a little human carelessness. When we search using the keywords 'wildfire in Hoàng Liên Sơn National Park' on Google, we find few wildfire events in electronic newspapers almost every year. Local populations living in this area earn an important part of their living through the cultivation of cardamom, which they dry in the forest after harvest using firewood that easily causes wildfires. In most wildfire events, there is no human loss of life, but the impact on the forest is very significant. Furthermore, wildfires increase the vulnerability of the local landscape and its population to further disasters such as landslides and flash flooding.

## ICH CURRENT SITUATION IN LÀO CAI PROVINCE IN ASSOCIATION WITH NATURAL HAZARDS AND DISASTERS

### Impacts of Natural Disasters on ICH

Since ICH is difficult to materialise, the clear conceptualisation of this notion is necessary to better facilitate the assessment of natural disasters' impacts on ICH. According to recent research (Wilson and Ballard, 2017), ICH can be captured under the rubrics of **People** as the agents of ICH (i.e. individuals, communities, agents, transmitters, transactors, institutions and states); **Place** as the material or tangible setting (i.e. sites, environments, resources, settlements, objects and artefacts); and **Story** as immaterial and intangible settings (i.e. knowledge, narrative and tradition). This conception of ICH will be used in the following sub-sections to support the assessment of natural disasters' impacts on ICH.

This report relies mainly on secondary data. However, very limited information exists regarding the impact of natural disasters on ICH. We have reviewed a number of documents related to DRM, including reports/statistics about losses and damages caused by hazards such as flash flooding, landslides and extremely cold weather in Lào Cai. Nevertheless, no information exists regarding damages directly related to the local ICH, even in the recent Post-Disaster Needs Assessment (PDNA) reports. The PDNA became a legal requirement in 2015 after the endorsement (by the Ministry of Agriculture and Rural Development (MPI, 2015)) of the national guidelines on inventory of losses/damages caused by natural disasters. This document mentions the need to invent damages related to the culture sector. However, only the **Place** (i.e. the material or tangible setting, including 'cultural building,[7] cultural and historical site, scenic landscape, assets, cultural equipment' (Article 5.đ.)) is referred to. In addition, both the 2016 and 2017 PDNA reports do not mention material losses associated with local ICH. Similar gaps were identified in the annual reports of the SCNDPC[8] over the last 10 years.

In the culture sector, the PDNA process does not exist (Trần Hữu Sơn, 2017). The Department of Culture, Tourism and Sport and their lower-level line agencies have never conducted any assessment of the impact of natural disasters on local ICH. Most of the damages recorded to date relate to tangible heritage, such as impacts of the extreme hail

7 Defined as 'build institutions to serve cultural, information and propaganda activities' (Art. 2. 13).

8 This report reviews the losses and damages caused by natural disasters in the province and identifies key experiences and learning.

events in 2013 on the Bắc Hà Temple and Hoàng A Tưởng Palace (Lào Cai DCST, 2013) and in 2017 on the temple of Bảo Hà (Bảo Hà TMB, 2017). However, clarity was not established on the way local ICH that was associated with these **Places** was affected, for instance, the interruption of local festival activities and religious practices. It is important to note that the Festival of Bảo Hà temple had been inscribed in the national list of ICH 2016.

Given the information gap described above, we can only conduct a general discussion about the impacts of natural disasters on ICH in Lào Cai. Firstly, with regards to the ICH agents, natural disasters have caused significant human losses in Lào Cai in general and in Bát Xát and Sa Pa in particular. The number of deaths and missing people, among which the Dao people are often the most numerous, was 26 in 2016 and 11 in 2017 (Bích Hợp, 2017) (see previous section on recent disaster events in 2016). Since people have knowledge of ICH and are the most important element, human losses will inevitably cause some disruption and interruption of ICH performance and transmission.

Secondly, climate-related disasters have also had significant impacts on the **Places** associated with local ICH. For the Hà Nhì and Dao people, the places considered as tangible settings of their ICH are constituted of forest, rice fields and houses of vernacular architecture. As a tradition, the Dao people always choose to live along streams and rivers in the mountainous areas. Their daily lives and livelihood are therefore closely related to water and the forest. The flash flood in 2016 destroyed the whole Sung Hoang village where the Dao people had been living. As a result, people lost all their ICH-related settings, such as houses, cultural spaces and environments and had to move to other locations. The problem is that the relocation programme was designed and determined by the government without limited consultation with local communities and consideration of their ICH practices. People were moved far away from their traditional living environment (i.e. 10 km for the new Sùng Hoảng village). According to some researchers and officials from Lào Cai DCST, this change in living environment has had a negative influence on Dao-related ICH, as forest and watersheds are considered sacred places, where individuals perform rituals and that nurture their beliefs. Additionally, the new houses provided by the government were made from concrete with fibrocement roof instead of traditional materials, such as wooden structures, rammed earth wall and thatched roof. This may lead to the decline of traditional building knowledge and techniques.

**Figure 2**
Thirty-five families of Sùng Hoảng village victims of 2016 flash flood are relocated in a new place, 10 km away from the old village location. The new houses are in concrete with fibrocement roof.
(©Hà Thanh and Chí Tuệ)

Similarly, droughts, wildfires, hails and extreme cold events are considered significant threats for local ICH. For instance, these events have caused serious damage to local forests and crops, leading to significant reduction of raw materials (e.g. bamboo, medicinal trees, herbs and plants) for traditional livelihoods and craftsmanship, such as the basketwork of the Hà Nhì people and traditional healing practices of the Dao.

## Role of Local Knowledge (ICH) in DRR and Climate Change Adaptation (CCA)

In this section, we look at how ICH, or more specifically local knowledge, contributes to a lessening in the vulnerability of the community to natural hazards. Vulnerability (of community, assets and systems) is the combination of the degree of exposure, sensitivity and adaptive capacity (Phan Phương Anh and Vũ Cảnh Toàn, 2013). For instance, a social group living in areas frequently affected by flash floods and easily affected by flash flood events is considered to be highly vulnerable if they have limited capacity to this hazard, and vice versa.

Exposure to hazard depends on geographic location, property values in the affected area and the intensity and frequency of natural disasters. Sensibility can be interpreted as the degree to which a community or livelihood activities are affected by disasters. For example, the elderly and children are often most impacted by temperature change, whereas free-feeding cattle are more frequently affected by heatwaves and cold weather. Adaptive capacity includes aspects such as financial (e.g. the economic autonomy and ability of communities to respond to disaster events); technical (e.g. the capacity of DRM agencies in providing accurate weather forecast and effective flood early warning system; the skills and knowledge of communities in building storm/flood resistant housing; capacity to provide stable clean water and electricity even during time of disasters, etc.); institutional and policy (e.g. the effectiveness of organisational structures on DRR and CCA, the coordination between relevant agencies and the effectiveness of policies and strategies in DRR and CCA); social and cultural (e.g. social cohesion and community networks, traditional knowledge in dealing with natural disasters, such as living with floods) factors.

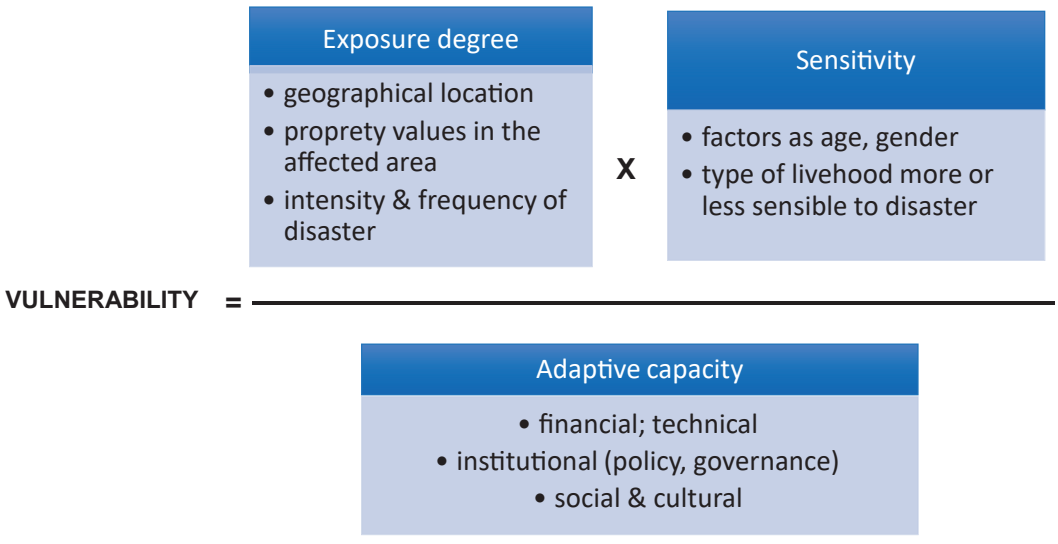


**Figure 3** Vulnerability framework

According to reviewed documents, Lào Cai government officials leading culture management and local researchers, ICH plays an important role in reducing exposure to natural disasters as well as in improving the capacity of local communities (i.e. the Dao and Hà Nhì people) in dealing natural disasters. Below are some examples.

***Environmental knowledge of the Dao people about water sources and the forest***

The Dao people often live near water sources in mountainous areas and have a strong connection to the water. Among 466 villages of Dao people in the Lào Cai province, 151 are named in relation with water sources (*nậm*, *khe*, *suối*, *hồ*) (Trần Hữu Sơn, 2017). The experiences of living with the water allows them to gain a deeper insight into the local geographical and hydrological conditions so that they can find the proper location to settle. According to a local researcher and former senior culture official, the Dao people often settle their villages (instead of individual houses) in the middle elevation level (never in a narrow valley between mountains) and at least 300 m away from nearby rivers/streams (Trần Hữu Sơn, 2018). In addition, these villages are always located and protected by a forest to the rear. This knowledge and these practices have helped the Dao people to be less exposed to flash floods, inundation and landslides.

Additionally, Dao communities consider surrounding forests as sacred places and have special mechanisms and customary laws to strictly protect these forests and watersheds surrounding their communities. The Dao people name themselves *kìm mùn* (or *kiềm miền*), signifying 'forest people'. This title indicates a close relationship, and linkages between them and their forests are considered sacred (Trần Hữu Sơn, 2017). Each Dao village has its sacred forest where individuals worship the forest god and the spirit of the village.

***Sacred mechanisms and customary laws to protect the forest of the Black Hà Nhì***

Similarly, forests have a particular place in the life of the Black Hà Nhì people in Lào Cai. Given their traditional attachment to wet-rice cultivation, their daily lives and livelihoods are highly water-dependent. Thus, protecting the forest that plays a key role in regulating water resources is vital for them. The Black Hà Nhì communities believe that the forests (trees and wild animals) have souls like human beings and are controlled by supernatural powers. They divided the forest surrounding their village into four forbidden forest groups corresponding to the worship of *Gà ma do* (protective God), *Mu thu do* (fecundity god and wife of Gà ma do), *Thủ ty* gods (founders of the village who ensure the peace and security of the village and protect livestock and poultries from diseases) and forest for entertainment (i.e. places for community activities) (*A gò là do*) (Duong Tuan Nghia, 2017, Trần Hữu Sơn, 2017).

The rituals and festivals venerating the forest gods and water genies create a sacred sanction in order to protect the forest, watershed and water sources (Lào Cai DCST, 2015). Each Black Hà Nhì's village develops a system of customary laws consisting of village rules and sanctions for violation of these rules. For example, these documents require the need for 'taking care of trees, preventing fire, soil erosions and protecting habitat's topographical setting' (Lào Cai DCST, 2015). The rules also precisely forbid actions, picking/exploitation rules and the responsibility to mobilise the community to protect the forest against wildfires. Every human action (picking, dry firewood collecting, bamboo sprout picking, hunting, etc.) is strictly banned in the sacred forest. Villagers are only allowed to collect dry firewood at the ritual of worshipping forest gods to cook offering meals (Trần Hữu Sơn, 2017). Violation of the forest protection rules, such as cutting down a tree or causing a fire,

are charged with a fine, and detection of an intruder is rewarded.

Making the forest sacred and implementing strict customary laws as described above have contributed significantly to the protection of the forest surrounding the Hà Nhì villages and thus has reduced the threat posed by flash floods and landslides to the Hà Nhì community (Trần Hữu Sơn, 2017; Duong Tuan Nghia, 2017).

***Local knowledge to build resistant housing for extreme weather***

Since the Hà Nhì people have lived in high attitude for centuries, they have been frequently affected by extreme cold weather and windy conditions. To deal with such extreme conditions, they have developed some special techniques in building their houses. These techniques consist of applying knowledge about choosing the right location, the right materials from local resources (e.g. rock and stone for foundation, clay for rammed earth wall that has double layers and is at least 60 cm thick, wood for frames and straw for thatched roofing), and about designing the right structure (i.e. the vernacular architecture). There is much evidence showing the strong capacity of these houses in dealing with extreme conditions such as strong wind and extreme and extended cold (Lý Khai Phà, 1998).

***Healing knowledge using medicinal plants***

The Dao people are well-known among Vietnamese ethnic minority groups for having very diverse healing skills and rich knowledge about the medicinal properties of plants (Lê Thị Thanh Hương and Nguyễn Trung Thành, 2016). This includes knowledge about the location and procurement of medicinal plants in the forest, the benefits of these plants and how to use them for healing and improving human health. The Dao people have collected and used more than 50 wild medicinal plants for healing purposes (Nguyễn Ngọc Thanh, 2016). Several remedies (e.g. *đìa nhặn* soup) can be beneficial for people in dealing with extremely cold weather. The Dao people have also used different compositions of plants and herbs to treat arthritis and stiffness caused by extremely low temperatures (Lê Thị Thanh Hương and Nguyễn Trung Thành, 2016).

***Community network and cohesion as social capital in preparedness, response and recovery***

Community networks, cohesion and mutual support can play important roles in preparing for, responding to and recovering from disaster events (Hiwasaki, Luna and Marçal, 2015). In the Black Hà Nhì and Dao communities in Lào Cai, this community cohesion and network are strengthened due to the practice of traditional livelihood models and ritual and religious activities. For example, Dao communities in Lào Cai have practised the reciprocal exchange of labour (*pụi công*) for farming activities for years. People also provide mutual aid (*chảng khả*) to each other for more labour-intensive work, such as house building/renovating, timber and bamboo transportation and husbandry-making for cattle. Building a house in Black Hà Nhì communities often involves the whole village's support (Lý Khai Phà, 1998). People also help each other move cattle to warm and safe places to deal with extremely cold and windy conditions. In addition, individuals and households having difficulty or need financial support can always borrow money from other family members or other families in their village with zero interest (*pang chang mủa*) (Khổng Diễn, 1996, pp. 136-139). This mutual financial support helps families affected by, for example, flash floods and landslides to rebuild and/or repair their damaged houses and recover quickly from disasters.

According to ICH management practitioners and local researchers, this strong community network and mutual support, strengthened by traditional livelihood activities and cultural practices, have made a significant contribution towards improving social capital and thus the capacity of the Dao and Hà Nhì people in responding to natural disasters, especially during disaster and recovery phases (Trần Hữu Sơn, 2017). In high attitude, remote, mountainous areas where these communities are living, this local and internal-based capital is even more important as it may take significant time for external support forces/ resources to arrive in times of disasters due to the long distance and poor infrastructure conditions.

***Religious beliefs, rituals, festive events, psychological strength to respond to disaster and cohesion in recovery***

The Black Hà Nhì and Dao communities have strong beliefs in gods and a deep appreciation of nature. They organise regular ceremonies and festivals, such as forest worship and agriculture-related rituals to ask god for rain, productive harvests, and the reduction of disaster risks and disaster events such as floods and droughts (Trần Hữu Sơn, 2018). Local ICH researchers interviewed for this study confirm that such beliefs and ritual practices have helped the Black Hà Nhì and Dao communities in Lào Cai to better cope psychologically with disasters. This point is consistent with other studies that highlight the role of the religious beliefs in supernatural power in providing mental strength to believers, enabling disaster survivors to better cope with suffering and calamities and to maintain stability and strengthen social cohesion (IFRC, 2014; Schipper, 2010).

We can see that local knowledge may be involved in every aspect of DRR and adaptation, such as in predicting, preparing for, mitigating the consequences of and recovering from disaster events. However, climate change, urbanisation, economic growth and globalisation have posed significant challenges to the protection and maintenance of this knowledge. The following section will examine some cases where local knowledge/ICH is in endangered situations. This, in turn, may have negative impacts on people's vulnerability to climate-related disasters.

## Non-Climate Factors Influencing the Protection and Maintenance of ICH and Thus Vulnerability of Ethnic Community Groups to Natural Disasters

According to local officials in charge of ICH management in Lào Cai, the protection and maintenance of local ICH in general and ICH related to the Red Dao and Black Hà Nhì communities in particular has been highly challenging due primarily to non-climate-related factors such as pressures caused by population and economic growth and the lack of consideration of ICH in cultural and development policies (and not climate-related disasters). Research informants in Lào Cai have identified a number of examples regarding the increased loss (either partly or fully) of local ICH in the Red Dao and Black Hà Nhì communities. These losses, in turn, have increased the degree of vulnerability of the Red Dao and Black Hà Nhì people because ICH plays an important role in protecting them and improving their capacity to deal with natural disasters as discussed above.

Firstly, as mentioned earlier, the Dao people know where to find safe places to build their houses so that they are less exposed to flash floods and landslides (Trần Hữu Sơn, 2017). However, the population growth rate among the Dao communities has significantly

increased (Nguyễn Thế Huệ, 2003). This demographic explosion has forced the Dao people to move closer to streams/rivers, where the risks in relation to flash floods and landslides are much higher (Trần Hữu Sơn, 2017).

Secondly, population growth has also created significant pressure on traditional crop practices and forest protection. On the one hand, to ensure food safety and the demand of the significantly increased population, the Dao people have had to expand their cultivation land and modify their traditional swidden farming practices by shortening the time their fields are fallowed from 3 to 10 years (Phàn Phù Lìn, 2007). According to informants in Lào Cai, these actions have triggered deforestation and led to significant exhaustion of soils, resulting in soil instability. As a result, flash floods and landslides have become more frequent and severe. On the other hand, the Black Hà Nhì population is much smaller than the Dao group, calculated at only around 2000 people in 1998 (Xuân Mai, 1998; Trần Hữu Sơn, 2017). They have also experienced much less pressure from population growth and have done a better job maintaining traditional farming practices and their sacred forests. Therefore, the Black Hà Nhì people have been less vulnerable to natural disasters than the Dao group, although they are basically living in the same geographical conditions (Trần hữu Sơn, 2018).

Thirdly, the loss of local ICH is also a result of cultural and economic development policies. For example, during the 1960s to the 1980s, the practices of religious activities, such as rituals and ceremonies related to the sacred forest, were considered 'superstitious' activities (*mê tín dị đoan*) and thus were prohibited by the State. Significant losses of agriculture and forest-related rituals and festival activities that led to an increase in the violation of sacred forests were documented later in both the Dao and Black Hà Nhì communities (Trần Hữu Sơn, 2018). For instance, people in the Phìn Ngan village, Trịnh Tường commune in the Bát Xát district stopped practising rituals related to the sacred forest long before our field survey in 2007 (Phàn Phù Lìn, 2007).

Significant cultural changes related to local ICH in Lào Cai due to economic development policies were also documented. Since 1968, the Vietnamese government introduced the settled agriculture and sedentarisation programme to ethnic minorities. This programme has shifted the living style of these groups from scattered small villages to concentrated areas. Additionally, the new areas are often planned and designed by the State, with limited engagement of local communities and limited use of their knowledge. Furthermore, since 1990, under the nationwide transition from a collective to a market-oriented economy, the new agricultural model that combined wet-rice cultivation and industrial forest planting was introduced (Minister of Agriculture and Rural Development, 1999). As a result, local communities were encouraged to plant industrial trees such as cardamom in primary forests. Although the plantation of these trees has made an important contribution to poverty reduction (Phàn Phù Lìn, 2007), the continued expansion of industrial trees in primary forests has considerably reduced biodiversity (Phạm Ngọc Triển, 2016) and is considered an important cause for the increase in intensity and frequency of flash floods and landslides.

Finally, globalisation and industrialisation have also pushed the local ICH in the endangered direction. For example, the availability of cheap industrial plastic containers and textiles from China in large quantities (Trần Hữu Sơn, 2018) has discouraged local communities from continuing with basketwork and producing traditional textiles. In the long term, this

phenomenon will likely lead to the loss of knowledge about these traditional crafts. Similarly, local building knowledge has been lost due to the replacement of industrial materials and techniques.

Healing knowledge of the Dao people has also been more and more replaced by modern medicine. This is also because of the significant decline in medicinal plants and trees due to increased deforestation (Vũ Trường Giang and Nguyễn Thị Tám, 2015) and over-exploitation to meet the demands of the domestic and international (i.e. mostly Chinese) markets (Trần Hữu Sơn, 2018).

## The Gap in ICH Management in Relation to DRR/DRM

Based on a review of current policies related to DRR/DRM/CCA and culture management, we propose that a large gap exists regarding the overlap between ICH and DRR/DRM/CCA. There are a number of reasons for this assertion. Below are some examples:

- A significant lack of consideration of ICH in DRR and CCA is apparent. ICH has not been referred to in most of the current policies, government reports and assessments related to disasters and climate change. In some cases, local knowledge is mentioned in a very general manner. However, the current condition of this knowledge; how natural disasters, climate change and other factors affect this knowledge; how this knowledge contributes specifically to DRR and CCA; and how to protect and maintain this knowledge remain unclear and understudied.
- There is also a lack of consideration of natural disaster and climate change in current culture-related policies. For instance, disaster risks are not mentioned in any documents related to ICH safeguarding and promotion projects and programmes (either at the national level or in the Lào Cai province) from 2010 to 2016 that are reviewed in this study (Minister, 2016; LCPCP, 2015; LCPPC, 2017).

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# PERCEIVED IMPACTS OF ANTHROPOGENIC FACTORS AND CLIMATE CHANGE HAZARDS ON NATURAL LANDSCAPES AND CULTURAL HERITAGES (BAC HA MOUNTAIN, LAO CAI PROVINCE, VIETNAM)

Nguyen An Thinh[1], Tong Thi My Thi[1], Ta Van Hanh[2], Nguyen Hong Hanh[1], and Luong Thi Tuyen[1]

## INTRODUCTION

Vietnam is one of the countries most prone to climate change associated with natural hazards (IPCC, 2007; 2014). During the period 1958–2014, the annual average temperature in Vietnam increased by 0.6°C. The trend was not temporally and spatially uniform because during winter, the temperature increased more rapidly than in summer, and the northern areas tended to warm up faster than the southern area. The inland temperature increased more rapidly than that of the coast. Maximum and minimum temperatures significantly increased, with the highest rate being 1°C over a 10-year period. Daytime temperatures warmer than 35°C have increased all over the country, at a rate of 2–3 days per every 10 years in several regions. The last few decades saw many regions record high temperatures; the maximum temperature reached 42.7°C in 2015. In the northwest, the number of hot days declined. Vietnam has also witnessed an increase in the overall amount of rainfall; however, northern climate zones have experienced less rain while the southern ones have experienced more (MONRE, 2016).

Vietnam hosts national heritage sites all over its regions. These are important for the country's socioeconomic development as well as cultural identity. However, cultural heritage in Vietnam today is subject to both natural and anthropogenic pressures such as climate change, urbanisation and tourism growth. Cultural heritage sites in both coastal and mountainous area face a range of hazards; they are increasingly vulnerable to tropical storms in the low delta areas and increasingly affected by heavy rain-induced natural hazards such as landslides, flooding and flash flooding in the uplands (MONRE, 2016).

Table 1 shows examples of national cultural heritage sites affected by climate-induced hazards in Lao Cai province.

1 Hanoi University of Natural Resources and Environment (HUNRE), Vietnam
2 Vietnam Academy of Sciences and Technology (VAST), Hanoi

**Table 1** List of national cultural heritage sites affected by climate-induced hazards in Lao Cai province, Vietnam

| No. | Cultural heritage sites | Location | Foundation |
|---|---|---|---|
| 1 | Hoang Bay ('Ông Hoàng Bẩy') National Guard Historical Complex (Bao Ha Temple, Co Tan An Temple) | Bao Ha temple belongs to Bao Ha Commune, Bao Yen District, Lao Cai province. The temple is located on Cam Hill with very beautiful scenery along the Red River. | Worship the Hoang Bay generals, who trained and organised military training and fighting against invaders in Lao Cai, bringing liberation to the areas that now belong to Quy Hoa (now is Yen Bai, Lao Cai) |
| | | Co Tan An temple belongs to Tan An Commune, Bao Yen District, Lao Cai province, next to the Red River and opposite the Bao Ha temple | Worship national heroes (Princess Nguyen Hoang Ba Xa, who defeated the enemies and protected the national border. She was protected by the residents of Bao Ha and Khau Ban areas). |
| 2. | Nhuoc Son Temple ('Đền Nhược Sơn') | Belongs to Chau Que Ha Commune, Van Yen District, Yen Bai. The temple is located on the low hill (mudflat) near the Red River. | Worship General Ha Chuong, a real hero and outstanding general of the Tran Dynasty. He made a great contribution to the protection of national northern borders, and led the great victory of our nation against the invader Nguyen Mong. |
| 3 | Dong Cuong Temple ('Đền Đông Cuông') | The temple is located on the right side of Red River, Van Yen District, Yen Bai province. Dong Cuong temple was built on a large area, next to the river side and surrounded by rice fields and forest. | Dong Cuong temple was a shrine dedicated to Princess Dong Quang, founded by the Ha and Hoang clans, who were the Tay Khao founders and took turns to serve as government officials, and asserted the function of 'Dinh Tram' to deliver the two-way test dispatch between the central court and the local court. |
| 4 | Lung Lo Pass ('Đèo Lũng Lô') | Lung Lo pass belongs to Da village, Thuong Bang La, Van Chan District, Yen Bai province | 61 years ago, after the Northwest Campaign in 1952, the Party Central Committee decided to open the 13A Road, starting from Ben Hien in Tuyen Quang province, passing Ben Au Lau, passing Lung Lo pass to Co Noi crossroad. Road 41 serves the Dien Bien Phu campaign |

| Intangible cultural heritage (ICH) | | Climate-induced hazards | |
|---|---|---|---|
| Traditional | Newly imported | Hazard risks | Hazard occurred |
| - Thuong nguyen ceremony (first lunar January)<br>- Quan tuan tranh ceremony (25 May Lunar month)<br>- Hoang Bay's ceremony (17 July Lunar month), late Tet ceremony (Year end Tet) | - *Hau dong* ceremony (Practices related to the Việt beliefs in the Mother Goddesses of the Three Realms) | - Hail<br>- Tornadoes<br>- Flash floods<br>- Landslides (riverside, hill)<br>- Heatwaves | Hail, whirlwinds, trees collapsed, partially damaging the roof of the gate (date: 25 March 2017). |
| - Thuong Ngan Princess Ritual Ceremony (17 January Lunar month) | - *Hau dong* ceremony (Practices related to the Việt beliefs in the Mother Goddesses of the Three Realms) | - Hail<br>- Tornadoes<br>- Flash floods<br>- Landslides (riverside, hill)<br>- Heatwaves | Hail, whirlwinds, trees collapsed, partially damaged the ground of the temple. |
| - Temple ceremony on 20 January and 20 September Lunar month | | - Riverbank erosion<br>- Flooding<br>- Heatwaves<br>- Tornadoes<br>- Hail | The riverbank erosion occurred at the foot of the temple. This situation has not been assessed and restored. |
| There are two main ceremonies, on the first day of the Cat in January, and the day of the Cat in September.<br>Worship of Mother Goddesses<br>Hau vat in the Mother Goddesses Acclaim Ceremony<br>*Nem Con* (or *Sen*) throw the candles, tug, wrestling | - *Hau dong*<br>- *Cheo* singing<br>- Upriver Mother Goddesses worship Festival<br>- Carnival of Upriver Mother Goddesses Acclaim<br>- Performance of practice of worship Mother Goddesses<br>- Cinnamon fair and festival | - Riverbank erosion<br>- Flooding<br>- Heatwaves<br>- Tornadoes<br>- Hail | The riverbank erosion used to occur under the foot of the temple. This situation has been restored (embankment) |
| Historic war relic | | - Landslides | The Lung Lo pass was severely destroyed by a hurricane in July 2010, floods descended from the top of the pass and the historic pass was cut into sections. |

## CLIMATE CHANGE HAZARDS IN THE NORTHERN MOUNTAINS OF VIETNAM

### Climate Variability and Change

During the period 1858–2014 the annual average temperature in Vietnam increased by 0.62°C (0.1°C per 10 years). However, the trend was not temporally and spatially uniform; during the winter the temperature increased more rapidly than in the summer, and the north tended to become warmer faster than the South. The inland temperature increased more rapidly than along the coast. Maximum and minimum temperatures increased significantly, with the highest rate reaching 1°C over a 10 year period. The number of days with temperatures higher than 35°C increased all over the country, at a rate of 2–3 days per decade in several regions. The last few decades saw several record high temperatures; in 2015, the highest temperature reached was 42.7°C. However, in the northwest, the number of hot days declined (MONRE, 2016).

Rainfall has tended to decrease by between 5.8 and 7.3% in the Vietnamese northern mountainous region over the last 150 years, mostly during the fall season of each year (by 40%). However, rainfall during the spring time has tended to increase by 19.5% in the northwest. Rainfall extremes have decreased in most observation stations in the north, with the most pronounced decrease in the Northeast. The number of consecutive dry days has also increased in the north. Overall, the Vietnamese northern mountainous region has become drier over the last 50 years. The maximum rainfall during 1 to 5-day periods was not consistent in all observation stations; however, there has been an increase in the maximum rainfall reached in 1-day in the northwest, and a decreasing trend in the Northeast. The number of consecutive dry days has tended to increase overall, and the amount of torrential rainfall (95th percentile) has decreased at varying rates across the stations of the mountainous area (MONRE, 2016).

### Natural Hazards

The northern mountainous region is complex and diverse and divided by many steep hills, rivers and streams. The high slopes create narrow and deep canyons which have caused the northern mountainous region to suffer from flash floods and landslides. In addition, in recent years this area has witnessed the impact of climate change, with many extreme weather phenomena such as cold spells, drought and hot sun, causing much damage to the lives and livelihoods of the people. In particular, more than 80% of the population in the northern mountainous areas are ethnic minorities, characterised by a lack of education, poverty and poorly diversified livelihoods, which has contributed to the increased vulnerability of the local people.

Monitoring the effects of climate change and extreme weather events over the past 30 years, the hydrological meteorological department has developed a detailed chart of hazard damage and extreme weather phenomena. According to the results, upland communities will continue to face increased risks of flash floods and landslides from heavy rainfall (CCFSC, 2014). In recent years, hazards have occurred in mountainous areas of an increasingly unprecedented severity and scale, devastating small watersheds and causing serious losses in terms of human lives, property and ecosystems. During the period of 10 years from 1994–2003, 453 people died or went missing, 277 were injured and tens of thousands were affected by natural hazards in the northern mountainous area. The

estimated total damage to infrastructure was estimated upwards of 1.7 trillion dong (NCHM, 2005).

In 2008, the General Statistics Office (GSO) reported that natural hazards had left 515 people dead or missing, over 230,000 ha of rice and crops lost, over 1 million cattle and poultry dead, 54,000 ha of damaged aquaculture and 4,700 houses destroyed. The total damage caused by natural hazards exceeded 430 million USD (GSO, 2009).

The year of 2008 was one of the worst in terms of the impact of turbulent storms and floods in the history of Vietnam. During August 2008, tropical storm Kammuri caused severe damage in the northern parts, particularly in Phu Tho, Yen Bai and Lao Cai provinces. In early November 2008, heavy rain and flooding affected 20 provinces in the region. Floods in mid-November once again resulted in loss of 208,719 ha of rice and 26,130 ha of aquaculture and extensive damage to irrigation infrastructure. In 2009, according to data from the Central Steering Committee for Flood and Storm Control, Vietnam was affected by 11 typhoons, 4 tropical depressions and many major floods, flash floods, cyclones, hail and landslides, causing a lot of damage to people and property. The total damage caused by typhoons and floods were estimated at around 23,200 billion dong (CCFSC, 2009).

During the year of 2010, the whole country suffered six storms, 4 major floods with many heat waves, droughts, long-lasting cold spells, which claimed 362 people as dead or missing, 490 injured, 6,000 houses destroyed, nearly 500,000 houses and 300,000 ha of rice damaged by flooding. The estimated physical damage amounted to about 16,000 billion dong (CCFSC, 2014).

## NATURAL LANDSCAPE AND CULTURAL HERITAGE

Bac Ha is the north-eastern district of Lao Cai province, Vietnam (Figure 1). It is widely known for its beautiful rugged karst mountain range, natural sightseeing and 14 ethnic

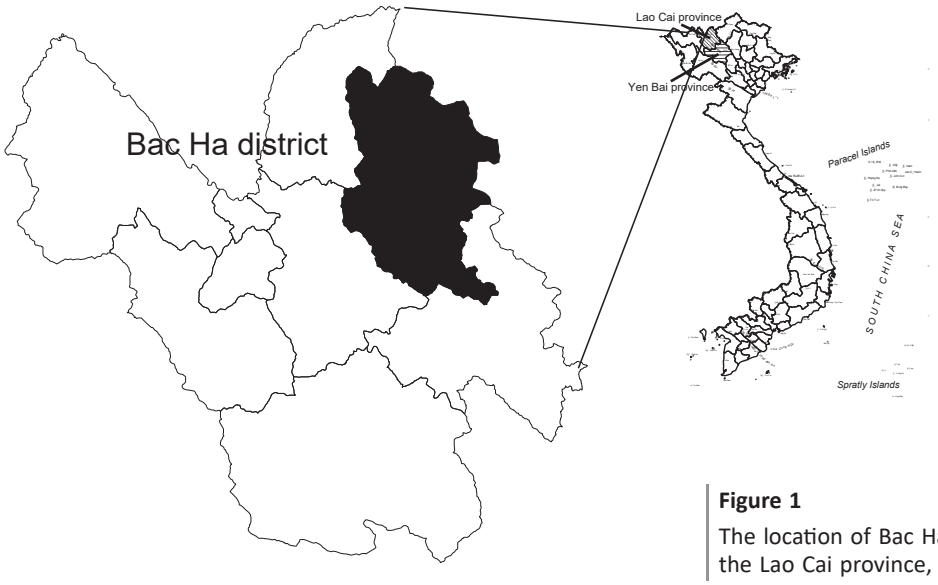



**Figure 1**
The location of Bac Ha district in the Lao Cai province, Vietnam

minority groups including Hmong, Dzao, Giay (Nhang), Han (Hoa), Xa Fang, Lachi, Nung, Phula, Thai, Thulao and others. Bac Ha is also called 'White Valley' (*'Cao nguyên trắng'* in Vietnamese), which refers to the pure white plum tree blossoms.

Bac Ha town is the urban centre of Bac Ha district. It has developed strong tourist and business services such as guesthouses, hotels, restaurants and a traditional silver carving industry thanks to its location at the centre of the district. It is the central location of district-wide agency and unit offices, and where local political, cultural and social activities are organised and implemented. The name 'Bac Ha' ('Bắc Hà' in Vietnamese) comes from the phrase 'Pac Ha' which means 'hundred bunches of grass' in the Tay language. Bac Ha town has a natural area of 148 ha of fertile land located in the basin valley, with an average height of 1,067.5 m above sea level. Bac Ha town has a temperate climate, cool in the summer and cold with frost in the winter. The average temperature ranges from 18°C to 19°C.

The Bac Ha district has four national cultural monuments of historic value. Two of them are located in Bac Ha town: the Bac Ha temple ('Gia Quoc Cong - Vu Van Mat' Temple, or 'đền Bắc Hà') and the Hoang A Tuong palace ('dinh Hoàng A Tưởng'). They are associated with important events in Vietnamese history (Figure 2).

**The Hoang A Tuong Palace**, also known as the Castle of Hmong's King ('dinh vua Mèo'), was built in 1914 by the French. The construction combines Western architecture with Oriental Feng Shui principles. It served as a palace for the Hmong leader, Hoang A Chao, the local king. The building was developed as a defence system with fortified walls, bunkers and watchtowers to monitor all movements 360° around the fortress. As a relic of French colonialism, the Hoang A Tuong palace remains quite intact. The total area of the house is 4,000 $m^2$, built in the style of Asian-European architecture within a rectangular closed loop. Over 90 years the palace became covered with moss but remained majestically outstanding in a busy residential area on a crowded street. This grand villa was preserved and embellished so that visitors could learn about the social history of the mountainous area. The palace was recognised as a national architectural monument on 11 June 1999 (Tran Hoa, 2017). Many architects, builders and lovers of nostalgic landscapes were saddened when the Lao Cai provincial government decided to renovate the Hoang A Tuong palace in such an outlandish way. This decision removed the beautiful paintwork on the exterior of the building replacing it with an ordinary facade.

**The Bac Ha Cultural Market** is famous for its original and characteristic features of ethnic minority cultures. It is divided into market sections such as brocades, food, horses, poultry, birds and forging. The market is one of the places that preserve the unique cultural features of the Vietnamese upland markets. The 'thang co' (thắng cố) pan sale in Bac Ha Market has been recorded as the largest pan sale in Vietnam. Bac Ha Market is a must-see for tourists coming to Bac Ha Town. This place retains the unique and colourful characteristics of the highland people. To the local people, going to the market means going out because the market is not simply a place to buy, sell, or exchange goods, but also a place to arouse the spirit of the culture, as a meeting and dating place. To go to the market, people have to venture out very early in the morning or even one day before. People often choose their most beautiful clothes to wear to attend the market. Bac Ha market used to be located on a hill. The surrounding ethnic minorities brought all kinds of highland products to the market, such as Shan tea, fruits, honey, wine, dresses, brocades,

silver jewellery, orchids, seedlings, horses, cows, pigs, or bags of corn and potatoes. In recent years, to meet the increasing demand for the exchange and sale of the local products of people from the neighbouring areas, Bac Ha market has been renovated by investors and has expanded into a larger area. Local authorities and cultural agencies have made a great effort to preserve the integrity of the market. The Bac Ha Fair features the bold communal activities of the ethnic people of the Northwest region, preserving the values of their traditional cultural identity.

**The Bac Ha temple** is dedicated to the national hero Vu Van Mat, who made Bac Ha famous and established the nation's north-western border under the Vietnamese Mac and Late Le dynasties. The temple was recognised as a National Historic Site on October 2003. On the seventh day of the seventh lunar month, a festival is organised for the residents and visitors to pay tribute to Vu Van Mat. Bac Ha also has a weekly market which is one of the most popular and largest in the north-west of Vietnam. The colourful dresses of the Flower Hmong costumes provide a particular attraction. On the market one buys meat and vegetables, wine, farm products and household supplies. Every year, people celebrated the temple festival on February 9th of the lunar calendar, and the anniversary of General Vu Van Mat on July 7th. The festival consists of cultural performances by the local people such as Tay folk dance, singing and folk games such as push rod, tug of war, chess, sealed eye and catching duck.

The temple festival not only promotes the value of cultural and historical relics but also contributes to the propagation of Bac Ha images to domestic and foreign tourists. Coming

(a) Bac Ha temple (Dimuonnoi, 2017)

(b) Bac Ha market (Sapalaocai, 2017)

(c) Hoang A Tuong palace (Dulichvtv, 2017)

**Figure 2** Cultural heritage of Bac Ha (Lao Cai, Vietnam)

to Bac Ha, tourists can enjoy the temples, or some of the famous specialties such as Ban Lien tea, corn wine, pho, or other famous attractive sites such as Thien Long cave, Giang Pho flower valley, heritage tree sites, or cultural villages.

## METHODOLOGY

### Sectorial Impacts and Questionnaires

Two weeks prior to the field trip in February 2017, the local authorities of the Bac Ha town and Bac Ha district prepared two reports; one on annual socioeconomic development and master planning in Bac Ha district until 2020, and another on natural hazard statistics. Official reports were collected during the field trip. A meeting held at the government office between the local authorities and Vietnamese researchers discussed challenges related to cultural heritage management and planning development.

We used the Driver-Pressure-State-Impact-Response (DPSIR) framework[3] to administer questionnaires to local residents and assess the consensus about the socioeconomic impact of climate change in a cultural heritage context. The survey consisted of 60 questions listed according to the following DPSIR elements:

- 7 questions on the drivers (D)
  urbanisation, socioeconomic transition, tourism development, population growth, infrastructure development, master planning, extreme hydro-climate events
- 8 questions on the pressures (P)
  heavy rain, flooding, landslides, housing construction, tourism infrastructure construction, tourism activities by visitors, tourism service activities by local people, transportation activities
- 21 questions on the states (S)
  landscape change, land use change, degradation of green space and open space, use of local plants, scenic quality, visual amenity, landscape aesthetics, accessibility of natural areas, cultural heritage in general, accessibility, authenticity, integrity, significance
- 10 questions on the impacts (I)
  number of visitors, length of visit, number of visitor complaints, level of visitor dissatisfaction, visitors willing to pay, tourism service quality, local income, local quality of life, local education, local health care; and
- 14 questions on the response (R)
  cultural heritage in general, authenticity, integrity, significance, number of visitors, length of visit, number of visitor complaints, level of visitor dissatisfaction, visitors' willingness to pay, tourism service quality, local income, local quality of life, local education, local health care

3 The DPSIR starts with drivers (human and natural factors) resulting in pressures on cultural heritage. The state of cultural heritage gradually changes, which in turn has a further impact on both the human and the natural environment, which leads to a response to correct the other four elements.

## Selection of DPSIR Parameters and Variables

Parameters and variables were selected that were compatible with the local context in the Vietnamese northern mountains. A range of economic, social, cultural, environmental and governance parameters were identified. Variables were selected on the basis of these parameters, which permitted the assessment of local people's perceptions of the sustainability of the natural landscape and cultural heritage management practices. As shown in Table 2, variables were selected based upon previous international research applied to the existing situation of the Vietnamese uplands.

**Table 2** Selected parameters and variables of DPSIR dimensions

| Dimensions | Parameters | Indicators |
|---|---|---|
| Driver (D) | Human drivers (D1) | Urbanization (D11), Socio-economic transition (D12), Tourism development (D13), Population growth (D14), Infrastructure development (D15), Master planning (D16) |
| | Natural drivers (D2) | Extreme hydro-climate events (D21) |
| Pressure (P) | Natural pressures (P1) | Heavy rain (P11), Flooding (P12), Landslides (P13) |
| | Human pressures (P2) | Housing construction (P21), Tourism infrastructure construction (P22), Tourism activities by visitors (P23), Tourism service activities by local people (P24), Transportation activities (P25) |
| State (S) | Total landscape (S1) | Landscape change (S11); Land use change (S12); Degradation of green space and open space (S13); Use of local plants (S14); Scenic quality; visual amenity; landscape aesthetics (S15); Accessibility of natural areas (S16) |
| | Cultural heritage (S2) | Cultural heritage in general(S21); Accessibility (S22); Authenticity (S23); Integrity (S24); Significance (S25) |
| Impact (I) | Visitors (I1) | Number of visitors (I11); Length of visit (I12); Number of visitor complaints (I13); Level of visitor dissatisfaction (I14); Visitors willing to pay (I15); Tourism service quality (I16). |
| | Locals (I2) | Local income (I21); Local quality of life (I22); Local education (I23); Local health care (I24) |
| Response (R) | Improving cultural heritage (R1) | Cultural heritage in general (R11); Authenticity (R12); Integrity (R13); Significance (R14) |
| | Improving tourism quality (R2) | Number of visitors (R21); Length of visit (R22); Number of visitor complaints (R23); Level of visitor dissatisfaction (R24); Visitors willingness to pay (R25); Tourism service quality (R26) |
| | Improving the local quality of life (R3) | Local income (R31); Local quality of life (R32); Local education (R33); Local health care (R34) |

## Data Processing

The results were summarised for each statement based on the weighted mean (wMean), rank mean, rank score, standard deviation and percentile. wMean shows an average value as the sum of the values divided by the number of values. It is calculated on the basis of all the data obtained, and therefore it is affected by unusual and extremely high or low values. The wMean is used for grouping data collected from individual perceptions and ranking quality using five or seven levels of measurement. The wMean for a 5-level Likert item is expressed as:

$$wMean(X) = \sum_{i=1}^{5} Xi\, p(Xi),\ \text{Xi} = 1,\ldots 5$$

# RESULTS

## Local Perceptions of the Impact of Climate Change Hazards and Other Factors on the Natural Landscape and Cultural Heritage

### *Driver factors*

As shown in Table 3, drivers shaping the natural landscape attract seven variables. The most significant driver was infrastructure development with a rank mean of 60.68 and a rank score of 22, followed by population growth (rank mean = 50.08); urbanisation (51.54); recent socioeconomic transition (50.08); extreme hydro-climate events (47.12); master planning (41.18); and tourism development (40.84). Extreme hydro-climate events ranked fifth among drivers changing the natural landscape.

Table 4 shows the drivers undermining cultural heritage. Infrastructure development shows the highest rank mean and rank score with 2.80 and 39, followed by recent socioeconomic transition (rank mean = 44.34); urbanisation (43.24); extreme hydro-climate events (41.94); tourism development (38.44), population growth (36.30); and master planning (36.62). Extreme hydro-climate events rank fourth among drivers undermining cultural heritage.

**Table 3** Drivers shaping the natural landscape

| Drivers | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Urbanization | 2.80 | 51.54 | 37 | 1.354 | 2 | 3 | 4 |
| Recent socio-economic transition | 2.72 | 50.08 | 40 | 1.275 | 1.5 | 3 | 4 |
| Tourism development | 2.24 | 40.84 | 67 | 1.165 | 1 | 2 | 3 |
| Population growth | 3.12 | 57.08 | 29 | 1.453 | 2 | 3 | 4.5 |
| Infrastructure development | 3.16 | 60.68 | 22 | 1.248 | 2 | 3 | 4 |
| Master planning | 2.44 | 41.18 | 66 | 1.261 | 1 | 2 | 3.5 |
| Extreme hydro-climate events | 2.68 | 47.12 | 45 | 1.215 | 2 | 3 | 3.5 |

**Table 4** Drivers undermining cultural heritage

| Drivers | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Urbanization | 2.44 | 43.24 | 57 | 1.557 | 1 | 2 | 4 |
| Socio-economic transition | 2.52 | 44.34 | 53 | 1.447 | 1 | 3 | 4 |
| Tourism development | 2.12 | 38.44 | 73 | 1.301 | 1 | 2 | 3.5 |
| Population growth | 2.16 | 36.30 | 79 | 1.143 | 1 | 2 | 3 |
| Infrastructure development | 2.80 | 50.86 | 39 | 1.354 | 2 | 3 | 4 |
| Master planning | 2.08 | 36.62 | 78 | 1.077 | 1 | 2 | 3 |
| Extreme hydro-climate events | 2.36 | 41.94 | 63 | 1.254 | 1.5 | 2 | 3 |

**Table 5** Natural pressures affecting the conservation of the natural landscape

| Pressure factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Heavy rain | 2.84 | 51.18 | 38 | 1.434 | 1.5 | 3 | 4 |
| Flooding | 1.72 | 29.04 | 91 | 1.061 | 1 | 1 | 2 |
| Landslide | 1.92 | 32.08 | 88 | 1.187 | 1 | 1 | 3 |
| Tornado | 2.16 | 36.28 | 80 | 1.434 | 1 | 1 | 4 |

**Table 6** Natural pressures affecting the preservation of cultural heritage

| Pressure factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Heavy rain | 2.24 | 38.28 | 74 | 1.300 | 1 | 2 | 3 |
| Flooding | 1.48 | 23.24 | 96 | 1.005 | 1 | 1 | 1.5 |
| Landslide | 1.48 | 24.96 | 95 | 0.823 | 1 | 1 | 2 |

### *Pressure factors*

Tables 5 and 6 show the natural pressures affecting the conservation of natural landscape and the preservation of cultural heritage. In Bac Ha, heavy rain has had the strongest impact on the natural landscape with a rank mean of 51.18 and a rank score of 38, followed by tornadoes (36.28); landslides (32.08); and flooding (29.04) (see Table 5). Similarly, the greatest natural pressure upon the preservation of cultural heritage was heavy rain with a rank mean of 38.28 and a rank score of 38, followed by landslides (24.96) and flooding (23.24) (see Table 6).

Tables 7 and 8 show human-induced pressures affecting the conservation of natural landscape and preservation of cultural heritage. Construction affected the natural landscape most strongly with a rank mean of 62.98 and a rank score of 17, followed by tourism service activities by local people (48.90), tourism infrastructure construction (48.40), transportation activities (46.36) and tourism activities by visitors (37.04) (see Table 7).

Meanwhile, tourism service activities by local people had the greatest human-induced impact upon the preservation of cultural heritage with a rank mean of 43.06 and a rank score of 59, followed by tourism infrastructure construction (42.02), tourism activities by visitors (37.04), housing construction (35.86) and transportation activities (33.96) (see Table 8).

**Table 7** Human-induced pressures affecting the natural landscape

| Pressure factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Housing construction | 3.36 | 62.98 | 17 | 1.440 | 2 | 4 | 5 |
| Tourism infrastructure construction (hotel, motel, restaurant, etc.) | 2.80 | 48.40 | 43 | 1.472 | 1 | 3 | 4 |
| Tourism activities by visitors | 2.44 | 42.58 | 61 | 1.158 | 1 | 3 | 3 |
| Tourism service activities by local people | 2.68 | 48.90 | 42 | 1.108 | 2 | 3 | 3 |
| Transportation activities | 2.48 | 46.36 | 48 | 1.123 | 1.5 | 2 | 3.5 |
| Housing construction | 2.16 | 35.86 | 81 | 1.106 | 1 | 2 | 3 |
| Tourism infrastructure construction (hotel, motel, restaurant, etc.) | 2.40 | 42.02 | 62 | 1.354 | 1 | 2 | 3.5 |
| Tourism activities by visitors | 2.16 | 37.04 | 77 | 1.434 | 1 | 2 | 3 |
| Tourism service activities by local people | 2.44 | 43.06 | 59 | 1.158 | 2 | 2 | 3.5 |
| Transportation activities | 2.04 | 33.96 | 87 | 0.889 | 1 | 2 | 3 |

**Table 8** Human-induced pressures affecting cultural heritage

| Pressure factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Housing construction | 2.16 | 35.86 | 81 | 1.106 | 1 | 2 | 3 |
| Tourism infrastructure construction (hotel, motel, restaurant, etc.) | 2.40 | 42.02 | 62 | 1.354 | 1 | 2 | 3.5 |
| Tourism activities by visitors | 2.16 | 37.04 | 77 | 1.434 | 1 | 2 | 3 |
| Tourism service activities by local people | 2.44 | 43.06 | 59 | 1.158 | 2 | 2 | 3.5 |
| Transportation activities | 2.04 | 33.96 | 87 | 0.889 | 1 | 2 | 3 |

### *State (S)*

The state of natural landscape change was characterised by 14 indicators (Table 9). Land use was ranked as the greatest change in the Bac Ha with a rank mean of 74.06 and a rank score of 7, followed by landscape change in general (67.32), scenic quality, visual amenity and landscape aesthetics (58.70), water pollution (57.38), river channel change (55.30), soil degradation (51.86), accessibility of natural areas (49.02), biodiversity loss (47.94), degradation of green space and open spaces (47.12), solid waste (45.32), use of local plants (45.02), noise pollution (44.06), air pollution (43.82) and geomorphologic changes (41.68).

The significance of cultural heritage sites has been greatly modified (rank mean is 46.82, rank score is 47). Although cultural heritage plays an important role in providing people with an understanding of social values, beliefs and the religion and custom-based dimensions of their culture, some respondents said that the function of cultural heritage sites in Bac Ha was now only recreational because cultural heritage sites provide open spaces for local residents and tourists. This modification was followed by cultural heritage changes in general (40.58), integrity (37.68), accessibility (35.64) and authenticity (34.94)

**Table 9** The state of natural landscape change

| State factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Landscape change in general | 3.68 | 67.32 | 12 | 1.180 | 3 | 4 | 5 |
| Geomorphologic change | 2.24 | 41.68 | 64 | 1.012 | 1.5 | 2 | 3 |
| River channel change | 3.08 | 55.30 | 34 | 1.187 | 2 | 3 | 4 |
| Biodiversity loss | 2.72 | 47.94 | 44 | 1.370 | 2 | 2 | 4 |
| Land use change | 4.04 | 74.06 | 7 | 1.274 | 3.5 | 5 | 5 |
| Water pollution | 3.20 | 57.38 | 28 | 1.291 | 2 | 4 | 4 |
| Soil degradation | 2.92 | 51.86 | 35 | 1.187 | 2 | 3 | 4 |
| Air pollution | 2.56 | 43.82 | 55 | 1.121 | 1.5 | 3 | 3.5 |
| Noise pollution | 2.48 | 44.06 | 54 | 1.358 | 1 | 2 | 4 |
| Solid waste | 2.64 | 45.32 | 51 | 1.114 | 2 | 3 | 4 |
| Degradation of green space and open space | 2.68 | 47.12 | 46 | 1.180 | 2 | 3 | 3.5 |
| Use of local plants | 2.72 | 45.02 | 52 | 1.308 | 1 | 3 | 4 |
| Scenic quality, visual amenity and landscape aesthetics | 3.20 | 58.70 | 26 | 1.633 | 1 | 3 | 5 |
| Accessibility of natural areas | 2.88 | 49.02 | 41 | 1.740 | 1 | 3 | 5 |

**Table 10** The modification of cultural heritage

| State factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Cultural heritage in general | 2.36 | 40.58 | 68 | 1.186 | 1 | 2 | 3.5 |
| Accessibility | 2.12 | 35.64 | 83 | 1.333 | 1 | 2 | 3.5 |
| Authenticity | 2.04 | 34.94 | 85 | 1.098 | 1 | 2 | 3 |
| Integrity | 2.20 | 37.68 | 75 | 1.258 | 1 | 2 | 3.5 |
| Significance | 2.56 | 46.82 | 47 | 1.660 | 1 | 2 | 4 |

(Table 10). Hoang A Tuong palace provides a typical example. In the early 2000s, the beautiful, ancient and magnificent palace was re-painted bright yellow in the surrounding green hills. Many architects, builders and lovers of nostalgic landscapes were saddened by the changes to Hoang A Tuong's palace when the provincial government renovated the building in such an outlandish way. This decision removed the beautiful paintwork on the exterior of the building replacing it with an ordinary facade.

### *Impact (I)*

The natural landscape and cultural heritage of Bac Ha attract many tourists, therefore, modifications may negatively impact upon the development of tourism and the livelihood of the local community. Local education was considered most significant influence on the natural landscape and cultural heritage of Bac Ha, with a rank mean of 65.00 and a rank score of 15, followed by the number of visitors (63.26), tourism service quality (60.04), the local quality of life (59.18), visitors willingness to pay (55.70), local income (55.58), local health care (46.24), length of visit (43.12), level of visitor dissatisfaction (40.28) and the number of visitor complaints (37.18) (see Table 11).

**Table 11** The impact of changes to the natural landscape and cultural heritage on tourism and the local community

| Impact factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Number of visitors | 3.36 | 63.26 | 16 | 1.440 | 5 | 2 | 5 |
| Length of visit | 2.48 | 43.12 | 58 | 1.194 | 5 | 1 | 3 |
| Number of visitor complaints | 2.24 | 37.18 | 76 | 1.200 | 5 | 1 | 3 |
| Level of visitor dissatisfaction | 2.36 | 40.28 | 69 | 1.186 | 4 | 1 | 3.5 |
| Visitors willingness to pay | 2.96 | 55.70 | 31 | 1.513 | 5 | 1.5 | 4.5 |
| Tourism service quality | 3.16 | 60.04 | 23 | 1.068 | 5 | 3 | 4 |
| Local income | 3.20 | 55.58 | 33 | 1.414 | 5 | 2 | 4 |
| Local quality of life | 3.20 | 59.18 | 25 | 1.155 | 5 | 2 | 4 |
| Local education | 3.44 | 65.00 | 15 | 1.294 | 5 | 2 | 5 |
| Local health care | 2.72 | 46.24 | 49 | 1.339 | 5 | 1 | 4 |

**Table 12** Dimensions of landscape change

| Impact factors | wMean | Rank | | Std. Deviation | Percentiles | | | |
|---|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | | 75th |
| Landscape change in general | 3.20 | 55.64 | 32 | 1.291 | 5 | 2 | 3 | 4 |
| Geomorphologic change | 2.16 | 35.66 | 82 | 1.405 | 5 | 1 | 2 | 3.5 |
| River channel change | 2.16 | 35.34 | 84 | 1.313 | 5 | 1 | 2 | 3 |
| Biodiversity loss | 2.40 | 41.58 | 65 | 1.472 | 5 | 1 | 2 | 4 |
| Land use change | 3.32 | 59.68 | 24 | 1.520 | 5 | 2 | 4 | 5 |
| Water pollution | 3.20 | 57.02 | 30 | 1.443 | 5 | 2 | 4 | 4 |
| Soil degradation | 2.64 | 46.22 | 50 | 1.411 | 5 | 1 | 2 | 4 |
| Air pollution | 2.44 | 43.34 | 56 | 1.294 | 5 | 1 | 3 | 3.5 |
| Noise pollution | 2.44 | 42.74 | 60 | 1.474 | 5 | 1 | 2 | 4 |
| Solid waste | 2.36 | 39.96 | 70 | 1.411 | 5 | 1 | 2 | 4 |
| Degradation of green space and open space | 3.84 | 72.18 | 9 | 1.573 | 5 | 2.5 | 5 | 5 |
| Use of local plants | 3.64 | 66.14 | 13 | 1.287 | 5 | 3 | 4 | 5 |
| Scenic quality, visual amenity, and landscape aesthetics | 3.28 | 62.38 | 18 | 1.720 | 5 | 1 | 4 | 5 |
| Accessibility of natural areas | 2.88 | 51.80 | 36 | 1.536 | 5 | 1 | 3 | 4 |

The greatest changes noticed in the landscape (Table 12) were attributed to the degradation of green and open spaces (rank mean of 72.18 and a rank score of 9), followed by the use of local plants (66.14), scenic quality, visual amenity and landscape aesthetics (62.38), land use change (59.68), water pollution (57.02), landscape change in general (55.64), the accessibility of natural areas (51.80), soil degradation (46.22), air pollution (43.34), noise pollution (42.74), biodiversity loss (41.58), solid waste (39.96), geomorphologic change (35.66) and river channel change (35.34).

### *Response (R)*

According to local people's opinion, cultural heritage must be preserved using multiple methods as a top priority. First of all, greater authenticity is needed (rank mean of 84.60 and a rank score of 2), followed by greater integrity (73.82), significance (65.22) and the improvement of cultural heritage in general (62.06) (Table 13).

Local people named their second priority as improving the quality of tourism and the local quality of life. To achieve this, an increase in the number of visitors is the first priority (mean of 82.14 and a rank score of 1), followed by increasing the length of the visit (80.46), improving local education (79.00), increasing local income (76.76), increasing the amounts the visitors are willing to pay (75.76), improving the local quality of life (71.82), improving the quality of tourism services (69.14), decreasing the number of visitor complaints (60.82) and reducing the level of visitor dissatisfaction (58.42) (Table 14).

**Table 13** Response to improving cultural heritage

| Response factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Cultural heritage in general | 3.60 | 62.06 | 19 | 1.472 | 3 | 4 | 5 |
| Authenticity | 4.40 | 81.60 | 2 | 1.190 | 4 | 5 | 5 |
| Integrity | 4.08 | 73.82 | 8 | 1.320 | 3.5 | 5 | 5 |
| Significance | 3.64 | 65.22 | 14 | 1.469 | 2.5 | 4 | 5 |

**Table 14** Responses to improving the quality of tourism and the local quality of life

| Response factors | wMean | Rank | | Std. Deviation | Percentiles | | |
|---|---|---|---|---|---|---|---|
| | | Mean | Score | | 25th | 50th | 75th |
| Number of visitors | 4.48 | 82.14 | 1 | 0.770 | 4 | 5 | 5 |
| Length of visit | 4.32 | 80.46 | 3 | 1.108 | 4 | 5 | 5 |
| Number of visitor complaints | 3.52 | 60.82 | 21 | 1.584 | 2.5 | 4 | 4.5 |
| Level of visitor dissatisfaction | 3.36 | 58.42 | 27 | 1.655 | 1.5 | 4 | 4.5 |
| Visitors willingness-to-pay | 4.16 | 75.76 | 6 | 1.143 | 3 | 5 | 5 |
| Tourism service quality | 3.68 | 69.14 | 11 | 1.145 | 3.5 | 4 | 4 |
| Local income | 4.16 | 76.76 | 5 | 0.898 | 4 | 4 | 5 |
| Local quality of life | 3.84 | 71.82 | 10 | 1.375 | 4 | 4 | 5 |
| Local education | 4.24 | 79.00 | 4 | 1.165 | 4 | 5 | 5 |
| Local health care | 3.44 | 61.04 | 20 | 1.261 | 3 | 4 | 4 |

## Authorities' Opinion of Cultural Heritage Management and Development

### *Development Planning and Cultural Heritage Management*

During official meetings between local authorities of the Bac Ha district and the Bac Ha town with the Vietnamese research team, the authorities introduced 'The activity plan of cultural heritage development in the Bac Ha town during 2010–2015' (Bac Ha DG, 2009). Following this action plan, the project 'Conservation and Promotion of the Traditional Culture through Building a Cultural Life with the Reform of Backward Culture in the Period 2011–2015' was effectively implemented in Bac Ha. Cultural heritage sites and their inherent cultural values were preserved and promoted, creating attractive tourism

destinations and contributing to the socioeconomic development of the district.

Along with this project, cultural heritage is preserved and promoted by the Department of Culture and Tourism of Bac Ha district. During the period 2011–2015, two national-level scenic spots were recognised: Thien Long cave (in Ta Van Chu commune) in 2013, and the millennial trees which was recognised as a heritage trees in 2014. Throughout the district, cultural and historical relics were renovated and embellished to reverse their degradation over time. In 2013, the restoration of Bac Ha temple relics required 236 million VND in total. The government also invested in eco-tourism areas and tourist sites such as Bac Ha market, Hoang A Tuong palace, traditional villages such as village 2A, community tourism villages in the Na Tha (Ta Chai commune), Na Hoi Tay (Na Hoi commune) and Trung Do (Bao Nhai commune).

In addition, intangible cultural heritage practices have been preserved, developed and restored, such as the organisation of traditional festivals, including the festivals of Tay in the Ta Chai, Na Hoi, Ban Lien; the *Gautao* festival ('lễ hội Gầu Tào') of Hmong in Ta Van Chu and Thai Giang Pho; the forest worship of the Tay, Nung, Phu La; and the *Cap sat* and fire-dancing festivals of the Dao people in Nam Det. Traditional folk art and culture has been preserved through the organisation of a public art festival by the Department of Culture and Tourism of Bac Ha district. It is held biannually to promote the restoration of the traditional folk songs and dances of different ethnic groups. Furthermore, the development of culture, arts and sports has attracted an increasing number of participants. In 2014, the *The* (dance) art of Tay was recognised as a national form of intangible cultural heritage. Other national intangible cultural heritage practices that were recognised in Bac Ha district during 2011–2015 include the *Gautao* festival of the Hmong, the then ceremony of the Dao; the Tug of war of the Tay; the *Khen* music of the Hmong; the *Demotic* script of the Dao; and the art of *The* (dance) of the Tay inhabiting the Ta Chai commune.

The movement *'All People Unite to Build Cultural Life'* launched by the Bac Ha district government was widely welcomed by local people. Local authorities took the initiative to work out a plan to celebrate and relaunch this movement annually. This plan defined specific tasks to be carried out each month and each of quarter of the year. It emphasised close coordination between mass organisations at all levels and advocated for the more active participation of people in the implementation of the movement. So far, over 21 communes and towns have built village agreements. All of the cultural villages have built agreements which have been implemented and accepted by the people; 90% of cultural villages have applied democratic regulations at grassroots level, which has contributed to the promotion of democracy, political stability and socioeconomic development in rural areas. By 2015, 66% of families were recognised as cultural families, 61% of villages and street groups had received cultural titles; 100% of agencies and units met cultural standards. In addition, 21 arts and culture teams of 126 communes and villages had been established, consolidated and offered regular training to serve the country's great festivals, the political tasks of the localities and attract tourists.

Cultural sites were invested in by the public sector during the period spanning 2010–2015, including the national government, the Lao Cai provincial government and the Bac Ha district government. 88 village-level cultural houses and five communal-level cultural houses were built. In total, the number of village cultural houses were 124 and number of communal cultural houses were six. All 24 communities have their own community

learning centres. 56 sets of cultural equipment at a total cost of 880 million VND were provided, upgrading the total number of well-equipped cultural houses to 66. Nine broadcasting stations were invested in, repaired and upgraded. All 21 communes and towns now have loudspeaker systems. 93% of the population are able to access radio broadcasts and 70% of the population are able to watch TV programmes. The project also organised a mobile outreach team to disseminate information and serve local people, in order to raise their level of cultural enjoyment.

During the period of 2010–2015, there have been 378 public awareness sessions conducted on environmental hygiene, population planning and family planning, the new lifestyle wedding ceremony and hygienic livestock cages. The backward customs of the people in the uplands, such as their wedding and funeral ceremonies, were changed in accordance with the law to avoid close-relationship and child marriage, removing a dead body from the house after 48 hours, simplifying the funeral ceremony to save money and reducing the birth rate to three children (in total 13.8% of all babies born each year). Since 2015, only 28 out of 225 have been child weddings (accounts for 12%), 70% of villages have committed not to let cattle wander everywhere, 85.5% of households have installed hygienic latrines and 66.8% of households have obtained hygienic livestock cages.

The training and fostering of cadres in charge of cultural affairs has been assigned to those who are capable of performing basic cultural and information work. Since 2015, all 21 communes have achieved social and cultural titles and have been trained in the cultural sciences at an intermediate or higher level, with 15 out of 21 cadres satisfied, and 71.4% trained in other fields. There were five professional training courses organised for the grassroots culture team.

The total budget for the implementation of the second phase of 2011–2015 was 12,288 million VND, with 8,198 million VND sourced from public spending and 4,090 million VND funded from other sources.

***Challenges of managing and developing cultural heritage***

In addition to the introduction to planning cultural heritage management and development, local authorities shared their opinions about the factors limiting cultural heritage management and development in Bac Ha. The existing limitations in cultural management and development were identified as:

- Sloping land limiting the expansion of cultural and sport infrastructures;
- The educational level of local residents is uneven; the livelihoods of ethnic people are still difficult. The number of poor households is still high. The population is not concentrated, so that the response to cultural and artistic movements is not widespread. Some backward practices still exist in the remote villages, especially in wedding and funeral ceremonies;
- The social awareness of cultural and sport activities is limited leading to poor organisation and implementation;
- Local authorities in several communities have a limited capacity to supervise and monitor the tasks assigned to the mass organisations, which has led to the inadequate quality of the movement to unite all people to build a cultural life;

- The movement promoting cultural activities has developed rapidly, but it is unevenly distributed, being mainly focused in the centre of the district. The development in the remote areas and communes is still slow;
- The promotional campaign has not been effective because the professional contributors from local authorities and facilities have not achieved the actual requirements; and
- The low level of economic resources for grassroots cultural work did not meet the demand for people's cultural enjoyment.

The direction of the conservation, preservation and promotion of tangible cultural heritage in Bac Ha is shared by local authorities as follows:

- Improving the management and promotion of cultural and historical values to exploit and develop tourist attractions more effectively;
- Treating termites to restore, embellish and preserve the cultural relics of the Trung Do Temple;
- Plan for the development of professional villages; supporting traditional training for local people; promoting tourist products in the professional villages such as corn wine making in the villages in Ban Pho, horse saddle making in villages in Lung Phinh and incense making in the communes of Lung Tru and Thai Giang Pho;
- Encourage people to build and use traditional houses such as the Hmong hamlet houses and the stilt houses of the Tay, in combination with the development of cultural village tourism; to guide people to develop home-based tourism (homestay); and
- Studying and collecting artefacts for an exhibition of the traditional culture of the 14 ethnic groups of the Bac Ha district.

The direction of the conservation, preservation and promotion of intangible cultural heritage in Bac Ha are shared by local authorities as follows:

- Making detailed scenarios for seven traditional festivals, including: (i) the festival of the Tay in Ta Chai commune; (ii) the *Gautao* festival of the Hmong in Thai Giang Pho and Hoang Thu Pho commune; (iii) the forest worshipping festival of the Phu La in Lung Phinh; (iv) the fire-dancing ceremony of the Dao in Nam Det; (v) the festival of Bac Ha temple in Bac Ha town; (vi) the festival of Trung Do Temple in the Bao Nhai; and (vii) traditional horse racing in Bac Ha district;
- Finding funds for festivals;
- Intensifying the popularisation and propagation of traditional festivals;
- Creating promotional materials about the five typical forms of art and culture of the ethnic groups, including: the *khen* and *xinh tien* dance of the Hmong, the dating singing of the Dao, the dance of the Tay, singing and using traditional musical instruments of the Phu La, the dating singing of the La Chi;
- Preserving intangible cultural heritage at the national level; to study and promote the value of intangible cultural heritage practices to create products to develop tourist services;
- Compiling scientific records and recommendations to add the following festivals to

the list of national intangible cultural heritage: the *Xuong dong* festival the Tay in Bac Ha district; the decorative art on Hmong ethnic costumes; the cotton weaving technology of the La Chi;

- Studying and exploiting Thien Long cave for tourism;
- Organising cultural and artistic exchanges in the district through public art shows and sports competitions, to promote regional honour and encourage the development of national sports and art forms; and
- Organising training classes on traditional culture for ethnic people, such as the Hmong, Dao, Tay, Nung, Phu La, La Chi, etc.

Local authorities shared an investment in the construction of cultural institutions, which focus on the following issues:

- Building a system of cultural houses to the standards set by the Vietnamese Ministry of Culture, Sports and Tourism. To strive to meet the 2020 target of constructing five commune cultural houses, bringing the total number of communes with commune-level cultural houses to 11 communes. 75 new cultural houses will be built at the village scale and raise the total number of villages with cultural houses up to 217 cultural houses to meet the need for cultural activities;
- Investing in audio-visual equipment in 10 commune cultural houses and 50 cultural houses; and
- Upgrading and repairing all 21 broadcasting stations in the communes, towns and at village level.

Renovating traditional practices and building a healthy cultural environment was presented by local authorities as follows:

- Developing a plan to implement civilised wedding and funeral ceremonies, and other religious activities in the Lao Cai province;
- Carrying out professional family training for village heads and house group leaders; and
- Strengthening the organisation of propaganda, education and advocacy activities in various forms; raising awareness among cadres, Party members and people of all strata; to effectively implement the Party's directives and resolutions on building and developing Vietnamese culture and people to ensure the sustainable development of the country; to guide people to adopt civilised weddings and funeral ceremonies, and other religious festivals; to disseminate information on environmental sanitation, gender equality, population control and family planning.

Local authorities are aiming to remove obsolete marriage customs such as: close-relationship marriages, child marriages, forced marriages, high-price wedding requirements. People need to comply with the law strictly and conduct residential weddings instead of organising a luxury wedding ceremony, and only invite family friends and close friends for a wedding party. Moreover, they should remove obsolete ordinances in funerals, such as amulets, exorcisms and scattering paper and real money on the funeral route to avoid environmental pollution. Other activities during funeral ceremonies need to be implemented in accordance with the law and the Circular No. 04/2011/TT-BVHTT & DL dated 21 July 2011 by the Vietnamese Ministry of Culture, Sports and Tourism; to adopt

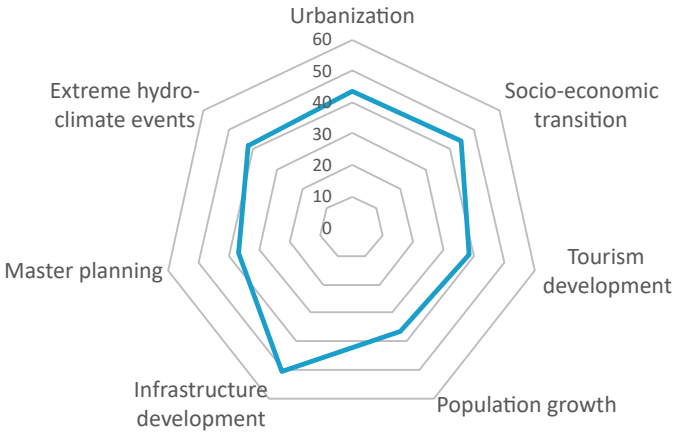
civilised wedding, funeral and festival ceremonies.

Finally, the elimination of old customs from the festival was discussed, such as taking advantage of the festival to practice superstitions such as fortune-telling, '*len dong*' dance, amulet protection, exorcisms for medical treatment; and burning graves within the festival areas.

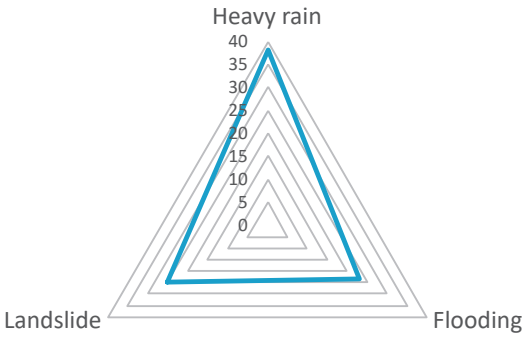
## DISCUSSION AND CONCLUSION

Vietnam is prone to the effects of climate change: the country is experiencing increasing temperature variations, rising sea levels and an increasing variation in the onset and the end of its main seasons (MONRE, 2016). Climate change and natural hazards especially affect the preservation of cultural heritages in the northern mountain region of Vietnam, causing changes to cultural heritage in general, its accessibility, authenticity, integrity and significance.

This study discusses the natural landscape and cultural heritage on the slopes of the Bac Ha mountain in northern Vietnam because this area is greatly affected by both natural and human activities. Consequently, all the selected respondents were 'experts by experience' because the focus of the study is on the local impact of climate change and local




(a) Driver factors affecting cultural heritage




(b) Natural pressures affecting cultural heritage

**Figure 3** Rank mean value of drivers and natural pressures affecting cultural heritage in Bac Ha (Lao Cai, Vietnam)

responses. Therefore, the perception of respondents reflects the present drivers, pressures, state, impacts and response to changes in the natural landscape and cultural heritage of the slopes at a local level. The results show that increasing natural and human pressures are undermining cultural heritages. Figure 3 shows that cultural heritage sites are strongly affected by both human-induced and natural factors, such as infrastructure development, recent socioeconomic transitions, urbanisation and extreme hydro-climate events. Climate change hazards are considered a significant pressure on the preservation of cultural heritage on the slopes; especially the deleterious effects of heavy rains, landslides and flooding.

This study faced uncertainties associated with the factors people perceived as least important. Overall, climate change hazards were hardly mentioned by the interviewees. In particular, the items considered of limited importance might be the result of bias. This study ranks the effects of natural hazards according to local people's perceptions, on the basis of the rank means derived from a Likert 5 scale. The Likert scale is widely used for this type of research and is considered an effective tool in many disciplines. However, the Likert scale is known to possess limitations; more complex relationships are hard to assess in this way while the respondents are unaware of this limitation. Another limitation of this study is that we did not investigate how the local people deal with culture-related regulations by local authorities at this stage of the field work. The community's viewpoint of these matters must be explored during the next field trip study.

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# ASSESSING THE SITUATION OF NATURAL DISASTERS AND LOCAL ADAPTATION: PRELIMINARY FIELD SURVEY IN BO RIVER BASIN, VIETNAM

Le Van An[1] and Ngo Tung Duc[2]

## BASIC INFORMATION ON THE AREA AND COMMUNITY SURVEYED

Thua Thien Hue, a province in Central Vietnam, is often affected by natural disasters, especially floods and storms. Natural disasters affect the lives, activities, production and intangible cultural heritage (ICH) of local people. This study describes the prevalent state of disasters in Thua Thien Hue, focusing on the communes of Huong Van and Huong Tra of Huong Tra Town to conduct a detailed survey of local disasters, in relation to ICH.

Huong Van Ward, in the town of Huong Tra, Thua Thien Hue Province, is located in a semi-mountainous area to the northwest of the city of Hue (Figure 1). The ward contains of four hamlets: Lai Thanh, Long Khe, Son Cong and Lai Bang, with a total area of 6,168 ha, of which agricultural and forestry land accounts for 1,390.13 ha, agricultural land occupies 502.85 ha, land for annual crops occupies 462.68 ha and perennial land accounts for 40.17 ha. There are 1,480 households with 6,930 people in Huong Van is. The income structure is 44% cultivation, 20% service, 24% animal husbandry, 4% fishery and 8% forestry (Huong Van Ward People's Committee in 2016). Huong Van is located in the Bo River Basin, which is affected by natural disasters, floods, floods and landslides every year. The annual floods have serious consequences for people's lives. From 1999 to now, Huong Van has had special floods in 1999, 2004, 2006 and 2007. Although moderate and small-scale floods do not pose a risk to most households, they are threats to the lives and property of the vulnerable.

Huong Phong is a coastal commune of Huong Tra, Thua Thien Hue Province; it is about 12 km to the northeast of Hue City (Figure 1). Huong Phong Commune is located at the end of Bo River and Huong River, surrounded by a system of rivers and lagoons. Due to its location, Huong Phong is a bottomland at the end of the source of Huong River, with an altitude of 1.0–1.5 m above sea level, and it is highly affected by storms, floods and saline intrusion. The population of the commune in 2016 was 10,713 people. The total land area is 1,569 ha, of which 672.16 is agricultural land (42.84% of total natural land area), 846.84 is non-agricultural land (accounting for 53.97% uncultivated land and 50 ha of unused land (3.19% of the area).

Floods affect the lives, activities and ICH in both communes. This is the influence

1 Center for Agriculture Forestry Research and Development (CARD), Hue University of Agriculture and Forestry

2 Post-Graduate Training Department, Hue University of Agriculture and Forestry

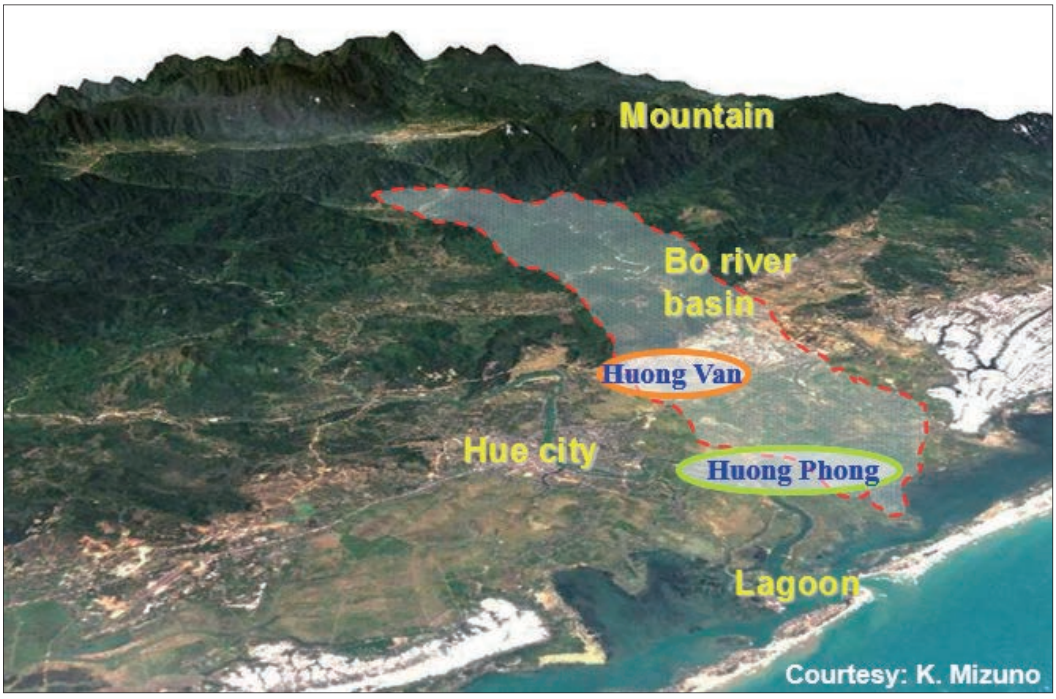


**Figure 1** Research sites: Huong Van and Huong Phong communes

frequently and deeply in the commune. While floods do bring the silty soil and salt necessary for agriculture, their negative impact on community livelihoods is not negligible.

## SURVEY METHODS AND DATA ANALYSIS (INTERVIEW STRATEGIES)

This study employed a comprehensive research methodology to collect qualitative and quantitative information. The main tools used were: secondary literature review, stakeholder work, interviews with key agents and with representative households, field observations and workshop organisation in consultation with the community and stakeholders. The research process is detailed in Figure 2.

The purpose of the literature review was to understand the general characteristics of the topic of research and the direction of research planning. This includes the collection and examination of previous studies, especially documents and reports from local authorities and relevant agencies. Using the collected data, analyses and syntheses will be conducted out to support the next step in the field survey and collection of primary data.

The first step in the field survey was to meet with stakeholders (one meeting per commune and 12 people per meeting). At these meetings, the research team shared the purpose of the study and acknowledged support, collecting information, including qualitative and quantitative information. The information gathered at this meeting was important to allow the team to identify unknown issues and missing points for the correction of questions and presentations (Figures 3 and 4).

The interviews were conducted with two groups: knowledgeable individuals and representatives of households. Semi-structured interviews were conducted for

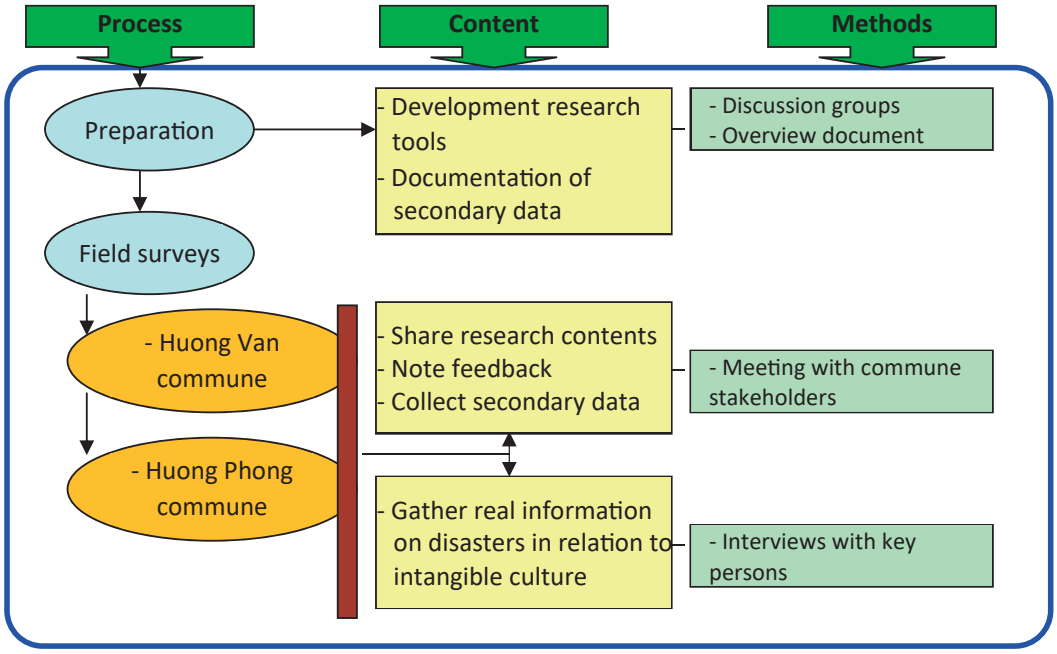


**Figure 2** Process, content and research method

**Figure 3**
Meeting with stakeholders in Huong Van Commune (©Ngo Tung Duc, 2008)

**Figure 4**
Meeting with stakeholders in Huong Phong Commune (©Ngo Tung Duc, 2012)

knowledgeable people (four per commune) and households (eight households per commune). Observations made to verify information were conducted during or after the interviews, depending on the specific conditions.

The data collected from secondary sources were aggregated, selected and analysed, based on the essential content of the research topic. The information and data collected from the core interviews are selected, cross-checked, processed and analysed for the purpose of further analysis and explanation of the facts and results of the study. The processing and presentation of these data tend to encourage qualitative assessment.

Of all natural disasters in Thua Thien Hue Province, floods bring the widest and deepest impact. Thus, the analysis focuses on floods in relation to ICH.

## IDENTIFYING KNOWN NATURAL HAZARDS AND RISKS IN THE AREA

### Thua Thien Hue Province

***Natural disasters in Thua Thien Hue***

*1. The impact of geographic location*

Thua Thien Hue Province is on the north-central coast, lying between 16–17 degrees north latitude and 107–108 degrees east longitude, in the tropical belt of the northern hemisphere known as the Asian seasonal wind-affected area. Located in the centre of Vietnam, Thua Thien Hue is influenced of not only by the northeast but also by the southwest one. The alternation of their effects and the scrambling of the air masses of different origins occurs each season. The convergence of cool air from the north flooding in and warm air from the south moving causes heavy rain and thunderstorms, leading to floods and flash floods, which cause landslides and riverbank erosion.

Thua Thien Hue also has a 127-km coastline on the East Sea, part of the Western Pacific, which often witnesses the largest storms on the planet.

*2. Impact of terrain*

Thua Thien Hue stretches from the northwest to the southeast, and about 75.9% of its total area is mountainous and 24.1% is coastal plains, lagoons and sand dunes. The Truong Son Mountain Range in the west has a height of 500–1,800 m and the Bach Ma Range in the south has a height of 1,200–1,450 m. These mountain ranges act as a windbreak in the north and southwest, intensifying heavy rains in the rainy season and causing the Foehn effect, which prompts dry weather and drought in the summer.

Much of Thua Thien Hue is located to the east of the peaks of the Truong Son Range, and the terrain moves quite rapidly from mountainous areas through hilly territory to the narrow plains, resulting in a steep slope. This area, with a slope of over 25 degrees, makes up 54% of the territory. The rivers which originate from the Truong Son range are short, steep and have many rapids. This characteristic causes floods and flash floods in the rainy season, and the flooding of the rivers that do not retain water during the low-rainfall seasons cause droughts and saline intrusion.

The coastal area of Thua Thien Hue occupies about 30% of the area of the province and more than 80% of the province's population lives there, relying on the Tam Giang–Cau Hai

lagoon system in the east, which is the largest lagoon system in the country, and on a large scale relative to its peer lagoons worldwide. It is protected by sand dunes stretching 102 km from north to southeast from Cua Viet (Quang Tri) to Tu Hien gate, 2–3 m high (Thuan An-Hoa Duan) to 41–42 m high (Quang Ngan). Rivers pour into the lagoon system before reaching the sea through the two gates Thuan An and Tu Hien. Those two doors are the decisive factor in the life of the lagoon system during its development. However, they are not stable: the state of the two doors are dynamic and change in an unpredictable manner. The deposition, erosion, closure and opening of the sea status threatens the habitability of the area. This is the most sensitive area, where floods, tsunamis and storm surges occur.

### *3. Effects of rain regime*

Rain has a great influence on flooding flow. Thua Thien Hue has some of the greatest amounts of rain in the country, with an average rainfall of about 3,000 mm per year, unevenly distributed, from 2,800 to 3,600 mm, in some places as high as 8,000 and 9,000 mm, as in Bach Ma. Heavy rainfall combined with steep terrain causes flash floods and landslides.

### *4. River network*

There are five main rivers in the Thua Thien Hue Province: O Lau, Huong, Nong, Truoi and Bu Lu, of which the Huong River system (Huong River and Bo River) is the most important, with a basin of 2,800 $km^2$, three-fifths of the area of the whole province. With short and steep features and almost no buffer zone, the flow of the flood from upstream to downstream is rapid (lasting 4–6 hours). Even with heavy rain, floods take about the same length of time to arrive.

## ***Main varieties of natural hazards***

Natural disasters cause loss of human life and property and greatly disturb human activity on a large scale. Natural disasters can be classified according to the extent of the damage they inflict, the extent of their impacts and their frequency of occurrence, as shown in Table 1.

**Table 1** Classification of natural disasters in Thua Thien Hue

| Strong impact | Medium impact | Weak impact |
|---|---|---|
| Flood<br>Storm, tropical cyclone<br>Water uptake<br>Hurricane | Flash flood<br>Landslide<br>Sea bank erosion<br>River bank erosion<br>Drought salt intrusion | Tsunami<br>Earthquake |

### *1. Flood*

Floods are extremely dangerous, as they have high intensity, cause serious devastation and damage areas in Thua Thien Hue every year. Floods in Thua Thien Hue are due to the heavy rain caused by certain weather patterns: cool air, storms and tropical cyclones, tropical convergence, high winds in the east and combinations of these.

Floods in Thua Thien Hue have the following characteristics:

- seasonality: following the rainy season, the main flood season lasts from October to

December every year; the total flow in the flood season accounts is 65% of total annual flow; in addition to the main floods, there are also small floods in May and June and early floods in August and September and late floods in January;

- flood ratings and recurrence: according to monitoring data from 1977–2006 on the Huong River, on average, there are 3.5 floods per year at Alert level II; the most there has been in a year since monitoring began has been 7 and the least is 1, and 36% of floods are large or especially large; during La Niña years, more floods and higher flood peaks occur;
- durations: depending on the rain and tides, the average duration of a flood is 3–5 days, with the longest lasting 6–7 days;
- time to reach flood zone: 5–6 hours on average, over a distance of 51 km from upstream (Thuong Nhat) to downstream (Kim Long); and
- flood amplitude and flood intensity: these depend on the amount and intensity of rainfall and shape of river crossing section; flood fluctuation ranges about 3–5 m, with the greatest flood intensity in the mountains of 1–2 m/h and in the delta of 0.5–1 m/h.

*2. Storm*

Storms and tropical cyclone are relatively rare occurrences in Thua Thien Hue, with an annual average of only 0.6 per year but with many serious consequences that take many years to overcome. According to storm data from 1952 to 2005 (a period of 54 years), there were 32 storms and tropical cyclones that affected Thua Thien Hue, including five strong and extremely strong storms, in 9.4% of years (Figure 5). These include the storms on 30 October 1952 in Hue, with a wind power of level 12 (122 km/h); storm Babs on 16

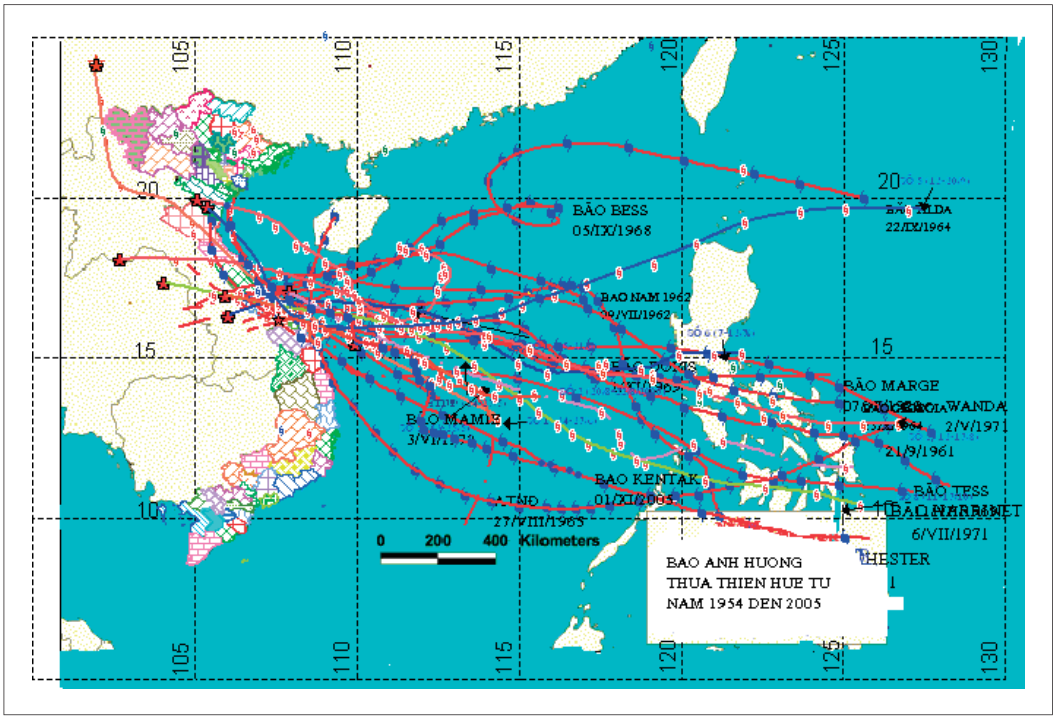


**Figure 5** Direction of storms in Thua Thien Hue province during 1954–2005

September 1962, of level 12 (118 km/h); typhoon Tilda on 22 September 1962, of level 13 (137 km/h); typhoon Patsy on 11 October 1973 (104 km/h) and storm Cecil on 16 October 1985, of level 11 (104 km/h) (Nguyen Viet, 2008).

The storm season in Thua Thien Hue begins in May and ends in November each year, and storms are most frequent in September, with 31% of all events, then follows October, accounting for 19%, and the other months each providing around 9% of storms, in a range from 4 to 12.5%. There are 0.6 hurricanes a year that directly affect Thua Thien Hue, with a maximum of three storms in one year (1971), and a minimum of no storms in a year. Over 50% of years have no hurricane. The average wind speed of a storm in Thua Thien Hue is 76 km/h, equivalent to a level-9, and the strongest speeds can reach level 13 (137 km/h). It is estimated that there will be a level-10 storm every 10 years and a level-12 storm every 20 years. Since 1991, no strong storm has landed in Thua Thien Hue. This is rare for a Vietnamese province. Beyond the damage caused by their strong winds, storms and tropical cyclones cause flooding due to their heavy rain. Storms combined with floods are dangerous weather patterns, producing damage like that of the storm in 1985 (Nguyen Viet, 2008).

### *Impact of natural disasters*

The damage caused by natural disasters in Thua Thien Hue from 1990 to 2006 is presented in Table 2. The analysis of disaster data shows that in the province, on average, 29 people die per year and property losses are 316.584 billion VND.

Floods are the most serious disaster. Large floods, such as those in 1990, 1995, 1996, 1998 and 1999, caused dozens of deaths and damage equivalent to hundreds of billions VND. The flood in 1999 was the most serious natural disaster in Thua Thien Hue over the last 100 years (Figure 6). Some specific examples of the impact of disasters follow:

- A flood on September 20–26, 1953, killed 500 people; 1290 houses drifted, 300 buffaloes died or carried away and 80% of crop area lost. At the Hue Citadel, the Quang Duc Gate (later called the Sap Gate [destroyed gate]) was destroyed.
- Following Liberation Day, a large flood occurred in Thua Thien Hue, on 15–20 October 1975. It caused a serious loss of life and property.
- From 28 October to 1 November 1983, a large flood in Thua Thien Hue Province killed 252 and injured 115, with 2,100 houses collapsed, 1,511 houses carried away and 2,566 cattle and 20,000 pigs carried away.

**Table 2** Impact of natural disasters from 1990–2006 in Thua Thien Hue Province

| Year | Losses of life | Losses of assets (billion VND) |
|---|---|---|
| 1990 | 18 | 56.540 |
| 1991 | 10 | 20 |
| 1992 | 8 | 12 |
| 1993 | 6 | 13.540 |
| 1994 | 1 | 1.2 |
| 1995 | 20 | 60 |
| 1996 | 31 | 127.322 |
| 1997 | 1 | 10.923 |
| 1998 | 25 | 168.120 |
| 1999 | 352 | 1,761.820 |
| 2000 | 5 | 73.6 |
| 2001 | 5 | 15.135 |
| 2002 | 9 | 15 |
| 2003 | 5 | 27.220 |
| 2004 | 10 | 248 |
| 2005 | 7 | 157 |
| 2006 | 8 | 2,931.09 |

**Figure 6**
Level of water in front of the citadel of the city of Hue during a flood in 1999 (©Nguyen Viet, 2008)

- During the historic flood in early November 1999, 352 people died; 21 were missing; 99 were injured; 25,015 houses collapsed or were swept away; 1,027 schools collapsed, 160,537 livestock died, 879,676 poultry died; there was a total loss of 1,761.82 billion VND.
- On 25–27 November 2004, a flood caused 10 deaths and more than 208 billion VND in damage.

In the series of historical records noted storms and its effects as follows:

- On 19 November 1904, a strong storm collapsed the Trang Tien bridge in the city of Hue, knocked over 22,027 houses, sank 529 ships and left 724 dead (Nguyen Viet, 2008).
- Storm Cecil landed in Vinh Linh (Quang Tri) on 16 October 1985, with a wind power of level 13, damaging the two provinces of Quang Tri and Thua Thien Hue. It destroyed 214,000 houses, 2,000 classrooms, 200 medical facilities and 600 high voltage towers, sank thousands of ships and left 840 dead, 100 missing and 200 injured. This level of storm has happened only once in the past 100 years.
- On 18 October 1990, typhoon Ed affected Thua Thien Hue, with a wind speed of 100 km/h, killing 18 people and causing property damage of 56,540 billion VND.
- The storm Yangsane hit Da Nang on October 1 2006, with a wind power of level 10 and 11, in the southern districts of Thua Thien Hue and causing flooding in the province with total financial losses of 2.910 billion and 10 deaths.

## In the Huong Van and Huong Phong Communes

### *Floods and local perception*

Huong Van and Huong Phong are communes in the Bo River Basin and are affected by floods every year. The people here are accustomed to living with floods. However, with the abnormal recent changes in the weather factor, the frequency and intensity of floods have fluctuated. This has impacted the life and production of the people in Huong Van and Huong Phong communes (Figure 7).

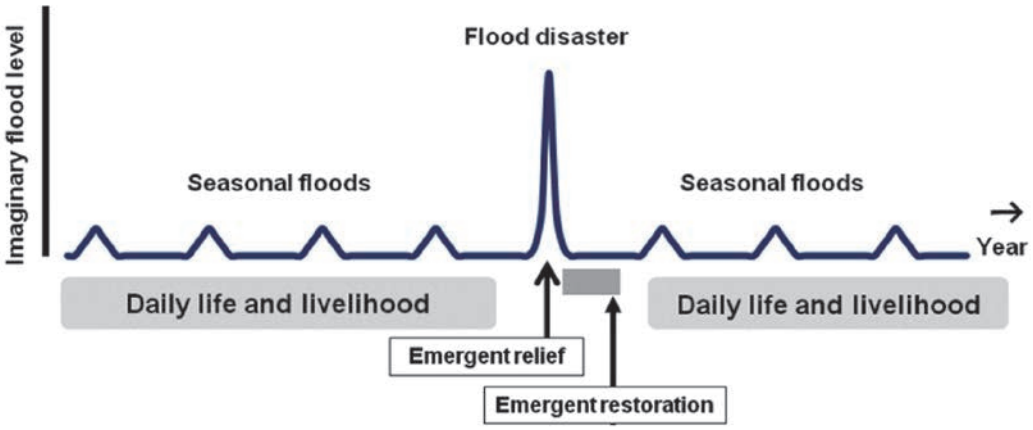


**Figure 7** Concept and local perception related to floods (Adapted from Le Van An, Tanaka and Kobayashi, 2013)

The major floods of 1999, 2004 and 2006 have left their traces on communities and locals. Many residential clusters and many households still have not overcome the consequences of the floods; a series of consecutive floods concentrated in the end of 2007 continued for a long period, causing even more loss and the burden on local people. In less than a month, from 30 October to 18 November 2007, five large-scale floods occurred, within an average interval of 4–5 days. The floods occurred specifically on the days of 30 October, 3, 11, 15 and 18 November 2007.

### *History of recent disaster events that have affected the community and the community's risks and vulnerabilities*

Although the floods that occurred in November 2007 were not as harsh as the floods in 1999 and 2004, their effects on the lives and production of local people were not small. Through group discussions and actual surveys combined with household interviews, the impact of floods can be generalised using the following key points:

#### *1. Level of flooding*

Most villages in the communes have been flooded. However, the water level and the percentage of households in the village were also different, as is shown in Table 3.

**Table 3** Flooding rates and affected households in November 2007

| No | village / flood event | Lai Bang | | Son Cong | | Long Khe | | Lai Thanh | |
|---|---|---|---|---|---|---|---|---|---|
| | | Water level (m) | Affected households (%) | Water level (m) | Affected households (%) | Water level (m) | Affected households (%) | Water level (m) | Affected households (%) |
| 1 | 30 Oct | 0.60 | 5 | 1.40 | 25 | 0.80 | 10 | 1.20 | 15 |
| 2 | 3 Nov | 0.75 | | 1.55 | | 0.95 | | 1.35 | |
| 3 | 11 Nov | 0.40 | | 1.20 | | 0.60 | | 1.00 | |
| 4 | 15 Nov | 0.90 | | 1.70 | | 1.10 | | 1.50 | |
| 5 | 18 Nov | 0.20 | | 1.00 | | 0.40 | | 0.80 | |

According to Table 3, Son Cong was the most affected village in the commune. The average water level of the floods ranged from 1.20 to 1.30 m, reaching a greatest water level of 1.70 m during the flood of 15 November. This was also the highest flood level in the commune. The villages of Lai Thanh, Long Khe and Lai Bang were inundated to depths from 0.6 to 1.0 m. Lai Bang had an average flood level and the lowest proportion of households flooded.

The average water level of the flooding in houses ranged from 0.5 to 0.8 m, and this affected the lives and activities of many households. Son Cong had the highest percentage of households affected (25%). Due to flooding, many households have been forced to move to higher and safer areas. Households with relatively stable housing, manpower and facilities have been coping with severe floods due to long periods of inundation and high frequency of floods.

The monitoring of flood level in the commune has been implemented by the authorities and committee in a timely fashion through the use of a floodwater meters gauge. This is a very important means ofproviding information to the community that contributes to the planning of responses. Water levels and timing are marked by members of the community information centre on all flood gauges (Figure 8).


**Figure 8**
Level of water in Son Cong (©Ngo Tung Duc, 2007)

**Figure 9**
The highest point of the main road to the commune center (©Ngo Tung Duc, 2007)

Due to the influence of flood water, the traffic system in the commune seems to be flooded and separated, especially the main roads into the commune centre (Figure 9). Travel becomes very difficult during floods. The main means of transport during this period are boats or rafts. In particular, relative to the previous year, the flood water took a long time to go down in 2007. The average duration of each flood was about 2–3 days, but this reached 5–6 days at the time of the last flood, on 18 November 2007. This has affected people's livelihoods. Many households cannot afford to produce anything and thus are earning no income to maintain their lives.

### *2. Impact on the infrastructure, life and production of the people*

In spite of the slow rise of the water, the long duration of flooding and especially the high flow rates, cause considerable damage to infrastructure, facilities and agricultural products. Statistics kept by the communes statistics, combined with an actual survey conducted by the research team, indicate the following damage.

- Cassava areas: 30 ha
- Pumping stations: three, in Lai Bang, Son Cong and Long Khe
- Riverbank erosion: length 27 m, average depth: 2.5–3 m
- Dredge canal: 5 m (in Lai Bang)
- Tea planting: 5 ha
- Clean water was supplied only after 1 month

Cattle and poultry were less affected, because people had moved them before the flood began; moreover, because the water flowed only slowly, it was easily for people to move their animals. The biogas system of the households is still functioning well, without causing any trouble during the recent flood.

The level of influence between locations also varies. Group 6, namely Son Cong, the pumping area in Lai Bang Hamlet and the riverside area in Lai Thanh Hamlet and groups 9 and 10, of Long Khe, are the most affected areas by flood (Figures 10 and 11).

**Figure 10**
Landslide along the banks of Lai Thanh
(©Ngo Tung Duc, 2007)

**Figure 11**
Dead plants after flood in household garden
(©Ngo Tung Duc, 2007)

The recent floods, in addition to interrupting productivity and causing difficulty for the lives of most people in the commune, caused many households to move to higher and safer locations. In Lai Bang and Lai Thanh, 27 households moved (16 in Lai Bang and 11 in Lai Thanh). These were households located along the Bo River, which is the area that is most affected by flooding occur. Although these households had received from the commune authorities land for themselves in higher areas to build houses and stabilise their lives, these are only temporary housing for needed residence in the new land. These families tended to return to the river banks after flooding. In addition, certain households in these groups move in with relatives and friends to avoid the flood.

As many as 15 school days may be missed, 3–4 days a year on average. Although the school is in a high location and impervious to flooding, many students cannot reach it, because the two main roads to school become flooded. The school ensures that makeup lessons are available by holding extra classes on Saturdays and Sundays. The school is still maintaining progress and quality in instruction.

In addition to material damage, human losses have also occurred during the recent flood. One official of Huong Dien Hydropower died in a stream near a hydroelectric dam due to carelessness in the crossing it.

## IDENTIFYING LOCAL ICH IN ASSOCIATION WITH NATURAL HAZARDS AND DISASTERS

### Viewpoint-Oriented Research

Intangible culture can contribute effectively to sustainable development in every aspect, and its protections solutions are needed if communities are to imagine a future for everyone.

ICH plays an important role in ensuring food security. Systems of cuisine, cultivating, animal husbandry, fishing, hunting, harvesting and the preservation of traditional foods can contribute much to food security and nutrition. Communities possess a considerable source of traditional knowledge, thanks to a comprehensive approach to their environment and rural life. They have developed skill in the use of diverse plant varieties and livestock, and they cultivate knowledge of the soil and natural habitats in damp, cold, arid or temperate areas. They have created a variety of methods of food processing, as well as of production and preservation, including local adaptation to environmental change.

ICH can help strengthen social cohesion and integration. Social customs, rituals and festivals create the lifeforms of communities and groups, which play an important role in reinforcing social structures.

ICH is essential for sustaining the livelihoods of groups and communities. Local knowledge, skill and practice preserved and promoted by generations form the livelihoods of many.

## Map ICH-Based DRR/DRM Techniques and Instances in which ICH is Used in Conjunction with Introduced (Scientific) Technologies

***Resilience of local government***

*1. Planning and direction of the locality*

In such extremely sensitive areas, preparation for coping and living with the flood is a priority interest for both the authorities and local people. The work of review and development is annually carried out in June before the flood season. In this activity, the flood control department reviews all human, material and financial resources. They review the floods that occurred in the previous year as a basis for orientating their work for the coming year. The human resources, material and directions of the department of flood control are as follows.

- Steering board: one main board and four sub-boards (15 people and 10 people)
- Means of communication: communication by loudspeaker and meeting to spread information and enable timely rescue
- Material resources and guidelines: the commune instructs the local grocery stores to stock instant noodles, which are delivered to locals in needed, and then the commune compensates the stores

In addition to local guidelines, depending on the specific conditions and characteristics of each village, the leadership and the flood control department develop their own plans to make prevention more effective. Particularly in Lai Bang, the management board and the department of flood control have:

- in all, 10 boats in ready position;
- each with a minimum of three healthy men;
- each with at least 20 litres of oil; and
- stores in the village stocked with at least four boxes of instant noodles.

*2. State support*

As it directs the implementation of flood prevention under the guidelines in place, local government has also received great support from the state and related organisations. During the last five floods, the commune and local people have received:

- Rice, 17 tonnes;
- Shrimp noodles, 901 boxes; and
- VMD 18.6 million from the charity, in which the state provided 6 million.

With the goal of not allowing the people to go hungry and ensuring fairness, commune authorities created a rational distribution of rice, instant noodles and money to each village. The Village Steering Committee uses the actual state of the households to distribute these items appropriately. On average, households received support as follows:

- Noodle soup: four times (five packs/time)
- Rice support: three times (average of four tael/person/time)

The teachers in Son Cong received the support of the state, and households were supported by the church, with such measures as 10 kg bags of rice and boxes of shrimp noodles.

***Countermeasure of the people***

*1. Restricting the impact on property*

The work of preparation and response before, during and after floods is also very diverse. In general, people's perception has changed since the floods in 1999. Most households sold their pigs before the flood season and moved their products to high places after harvest they. Food and other necessities were also prepared when information on flooding became available. There are ready-made tools, such as large iron cages, to facilitate the relocation of pigs and chickens as needed. The foundations of most houses are now from 1 to 1.5 m above the ground.

Many households have effective solutions for limiting damage caused by flood, using simple materials that can be found locally or be purchased without too much cost. Some examples of effective coping strategies or countermeasures that are commonly used by people to minimise flood damage follow.

- Use a boat to enter one's house and then put items and even pets on it. This is fairly common in the local area.
- Fuel from agricultural by-products is a very important source of fuel for rural households. Its storage, avoiding from the effects of flooding, is a matter of prime concern for most households. Bamboo trusses are placed 1–1.2 m from the ground, and fuel is stored in them (Figure 12).

**Figure 12** Fuel storage in preparation for flooding (©Ngo Tung Duc, 2007)

**Figure 13**
Car tyre tied under the bed to protect belongings (©Ngo Tung Duc, 2007)

**Figure 14**
Plastic barrels used in the model
(©Ngo Tung Duc, 2007)

**Figure 15**
The wooden selves system used in the model
(©Ngo Tung Duc, 2007)

- Taking advantage of perforated car tyres, some households in Son Cong village have been very successful in protecting their belongings from flood waters. These car tyres are tied below of the bed, two tubes per bed, and then items such as food, the television, the refrigerator, the computer, furniture and other goods are placed on top. Over many years, one family is now equipped with eight tubes, whose average price is 40,000 to 60,000 VND (Figure 13).
- Due to the flotation ability of closed barrels, some families in Son Cong village use plastic barrels, attaching them to four corners of a wooden shelf of 2.5 x 5.5 m, which thus can be used as a raft and can hold all important household appliances such as televisions, motorcycles, refrigerators, beds, cabinets and other goods, as well as family members. The informant family for this technique stated that it has been in use for a long time, even before the flood in 1999. The cost of creating this object is not high: 250,000 Dong can buy a 200-litre plastic barrel, and the materials to make the shelves can be obtained from the trees around the garden (Figures 14 and 15).

### *2. Improving production to adapt to floods*

a) Raising pigs: silage of leaves and cassava roots; building a two-storey pigsty in Huong Van Commune

Due to the long-term and frequent impacts of floods, local people have perceived that the storage of pig feed made from locally cultivated products, for example, leaves and cassava tubers, is extremely important (Figure 16). In the absence of floods, this source of feed satisfies livestock's needs and is easy to access and to purchase. However, this is entirely the reverse in the flood season. It is that it is impossible to reserve this food source in the normal form, not only because it cannot be stored enough term, but also because it has many toxins. The idea of silage to ferment leaves and cassava tubers for livestock production has brought quite fruitful results. After they are mixed, the materials are packed in a bag and buried in the ground. Thus, it can be stored even while the ground it sits in is inundated during the flood season.

Beyond preparing reserve feed, some have built a two-storey pigsty to prevent loss of animals from flooding (Figure 17). The pigs are moved to the second floor during flooding.

**Figure 16** Silage (fermentation) of leaves and cassava tubers (©Nguyen Thi Loc, 2008)

**Figure 17**
Two-storey pigsty (©Nguyen Thi Loc, 2008)

b) Biogas digesters

Pig farming is provides an important source of income for the people in Huong Van commune, accounting for 25% of household incomes, and 70% of households in the commune currently own 4–5 pigs. The manure from the pig raising is quite abundant and will affect the environment if it is not collected and managed properly. Especially in the rainy season, if it becomes waterlogged, the manure will be flooded and contaminate sources of water, causing pollution. For that reason, people have constructed of biogas systems to manage the source of waste while at the same time generating energy for cooking (Figure 18). In addition, an amount of decomposed fertiliser is serviced for agricultural production.

**Figure 18** Biogas system from manure serving cooking (©Ngo Tung Duc, 2007)

c) Brackish water polyculture and fish cultivation in Huong Phong Commune

Aquaculture is the basic livelihood activity of Huong Phong villagers beside wet rice cultivation. However, due to the impact of natural disasters and environmental concerns, it is possible that specialising in growing one species easily lead to the risks when diseases or disasters happen. Therefore, due to accumulated experience of frequent floods and their influence on the environment, people have changed their domestic economies from specialised farming to mixed farming (polyculture) in brackish water ponds (Figure 19). The model has proven effective and reduced risks in Huong Phong. Many households have adopted this model.

Beyond the model of polyculture in brackish water area, the flooding of freshwater ponds has brought positive results and has been conducted by many households (Figure 20). For this model, the creation of a barrier around the pond prevents the animals from moving from the pond during the rainy season.

d) Indoor mushroom cultivation in Huong Phong Commune

Using straws that are the byproduct of rice cultivation, people are growing mushrooms to create more income while avoiding polluting the environment. Before, mushrooms were once cultivated in summer season, usually outdoors, in a way that was low productivity, had requirements for a large space, was dependent on weather and was easily affected by floods (Figure 21). Since then, people have turned to a more effective form of farming: growing indoor mushrooms (Figure 22). This model has many advantages, such as 20% greater productivity, using a smaller space, not depending on weather, not being affected by floods and year-round cultivation.

**Figure 19**
Polycuture of fish, crab and shrimp in the same pond (©Nguyen Phi Nam, 2012)

**Figure 20**
Over-flood fish-growing pond (©Nguyen Phi Nam, 2012)

**Figure 21** Outdoor mushroom growing (©Vu Tuan MInh, 2012)

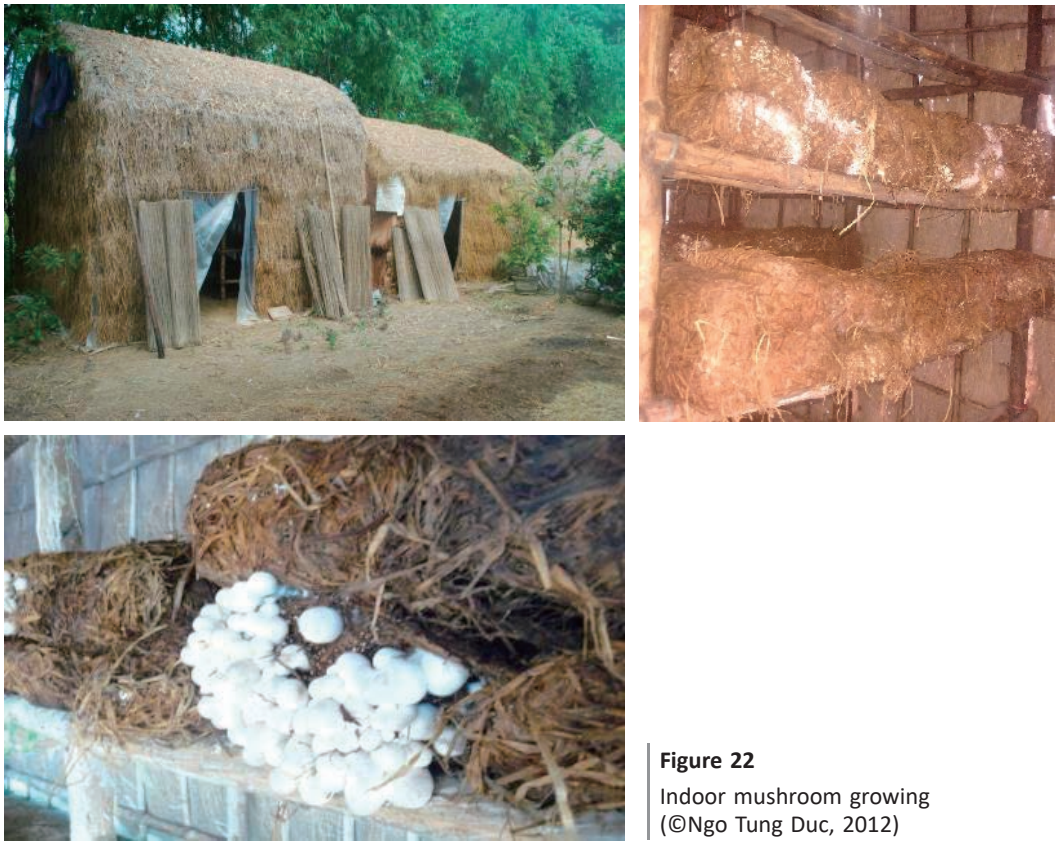

**Figure 22**
Indoor mushroom growing
(©Ngo Tung Duc, 2012)

## Traditional Systems/Mechanisms of Social Cohesion and Cooperation Contributing to DRM

### *Breeding club in Huong Van Commune*

Pig breeding is a main source of income in the communes. Many households are highly experienced and effective in animal husbandry, but others have little experience or effectiveness, especially poor households. Livestock breeding is most often the responsibility of women, and it is more risky to breed in areas that are frequently affected by floods. Therefore, to promote efficiency in husbandry, especially to increase the tendency of neighbours to help each other, sharing experiences, supporting livestock breeds, food and funds, the women in the commune have established a pig breeding club, with the support of the Women's Union (Figure 23). This model has proved fruitful and met with a very enthusiastic responses from locals and the government.

### *Water station in Huong Phong Commune*

Huong Phong is located downstream, in an area that has many river systems. The water station is a cultural symbol and a unique characteristic of the local culture (Figure 24). The water station is where people wash, bath, fetch water for their homes and transport equipment, materials and products for their household production. It is also where people meet, share information and experiences and talk about life and community activities. However, due to the frequency of floods, the quality of the water here has been reduced due to salinisation, so the frequency of use of and the need for this water station has tended to decrease. Village culture and community relations have also been influenced by this change.

**Figure 23** Breeding club meeting and visiting the model (©Ngo Tung Duc, 2008)

**Figure 24** People using the water station for daily activities (©Tran Thanh Duc, 2012)

## CONCLUSION

This study found the following, through documentation and fieldwork.

Thua Thien Hue Province is among the areas most affected by natural disasters, especially floods and storms. Floods and storms affect the lives, activity, production and intangible culture of residents of Thua Thien Hue. The communes of Hong Van and Huong Phong, within Huong Tra town, are affected by natural disasters and floods in particular. The people in these communities are especially vulnerable and are facing many challenges to their life and livelihood. The floods that occur every year damage agricultural production, affecting people's income. Floods alter crops and crops and livestock die or contract diseases, resulting in decreased production and increased costs of living.

Authorities and the local people have responded to the prevention, restoration and overcoming of the effects of various disasters. The knowledge and practice accumulated over time by the authorities and local people contribute to the sustainable use of natural resources and reduce the effects of climate change. Knowledge and coping strategies are an important foundation for managing the effects of disasters and climate change. Local communities, which are often situated in vulnerable and harsh environments, may be the first ones affected by climate change and natural disaster. Their knowledge of and

experience with nature and the climate are a source of diverse strategies for coping with the dangers of the natural environment. Through continual adjustment to adapt to the situation, such skills and knowledge are time-tested tools that aid local communities in reducing the risk of natural disasters and reconstructing their communities as needed and adapting to climate change.

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# ASSESSMENT OF THE IMPACT OF NATURAL DISASTERS ON INTANGIBLE CULTURAL HERITAGE IN AYEYARWADY REGION, MYANMAR

Khin Kay Khaing[1] and Saw Yu May[2]

## INTRODUCTION

This report discusses implementation of IRCI's project 'Preliminary Research on ICH safeguarding and Disaster Risk Management in the Asia-Pacific Region, Assessing the Current Situation of ICH in Association with Natural Disasters: Preliminary Field Survey in Myanmar'.

Natural disasters threaten the viability of intangible cultural heritage (ICH). Myanmar is vulnerable to natural disasters of earthquakes, cyclones, floods, landslides, and forest fire because of its unique geographic location. The cultural heritage of Myanmar, both tangible and intangible, has been exposed to various natural disasters, as well as other factors of threat such as development, urbanisation, and globalisation. Cyclone Nargis devastated the Ayeyarwady Delta in 2008, killing tens of thousands of people and ruining infrastructure. The damage to monasteries of Cyclone Nargis was the greatest impact to ICH. According to hazard profile of Myanmar, flooding is one of the major hazards accounting for 11% of all disasters, raking second after fire in numbers of occurrences (DFID, 2009). The Ayeyarwady River basin, the largest in the country, covers 404,200 $km^2$. Every year, over 2 million people are exposed to flood hazard in Myanmar (DFID, 2009). To the south of the basin, the Ayeyarwady Delta has experienced a series of floods for many years, due to its low-lying location and intricate stream system. Flooding usually occurs where high tide and high river water flow coincide, and such occurrences are worsening in recent years. The survey described here was conducted in the delta region. Because the Ayeyarwady Region experiences recurrent flooding, it was decided to make an assessment concerning what the impacts of flooding are on the residents of the Ayeyarwady Region.

The study assesses the impact of natural disasters on ICH in the specific area of the Ayeyarwady Region. The main objectives of this study are as follows:

- to observe the types, magnitudes and frequencies of natural disasters in the study areas;
- to explore the traditions, customs, beliefs, culture, religion and lifestyles of the community within study area; and
- to assess the impact of natural disasters on the ICH of the study area.

1 Geography Department, Pathein University, Myanmar
2 Geography Department, Taunggyi University, Myanmar

## GEOGRAPHICAL BACKGROUND OF AYEYARWADY REGION

The Ayeyarwady Region is also known as the Delta region, and it is situated in the southern part of Myanmar, between the Bay of Bengal to the west, and the Andaman Sea to the south. The Ayeyarwady Region consists of 26 townships, which has an estimated area of 35,031.88 $km^2$ (DPMIP, 2015). This region is the southernmost part of the Central Basin of Myanmar, which is composed of the watershed of the Ayeyarwady River and its distributaries. The whole area of the delta is crisscrossed by many rivers and streams. Most of these are tidal streams; some of the more important ones are Ngawun (Pathein), Daga, Pyanmalaw, Panmawadi, Ywe, Pyinsalu, Einme, Shwelaung, Bogale and Phyapon. The coastline of the delta is bordered by mangroves and mudflats. This region has a tropical monsoon climate. The monsoonal climate in the delta leads to an average annual rainfall of about 1,500–2,000 mm in the north, increasing to 2,500 mm in the southeast and 3,500 mm in the southwest. Over 90% of the rain falls between mid-May and mid-November. During the monsoon season, the maximum and minimum temperatures in the coastal zone are about 37°C and 22°C, respectively.

The Ayeyarwady Region is one of Myanmar's most populated regions, with an estimated population of 6,184,829 (DPMIP, 2015) and a population density of 176 people per $km^2$. It also has the greatest percentage of people living in rural areas (88%) relative to urban areas (12%). The region's population increased from 4,156,673 people in 1973 to 6,184,289 in 2014. However, it shrank in relative terms, going from having 14.4% of Myanmar's total population in 1973, to 12.0% in 2014. Most of the inhabitants of the Ayeyarwady Region rely on agriculture for their livelihood (Foster, 2017).

Because the western and southern portions of the region are contiguous with Bay of Bengal and because the whole region is low-lying with numerous streams, the major natural disasters in the Ayeyarwady Region are cyclones, storm surges and flooding events. It is situated in the major cyclone zone in Myanmar, but these are of low frequency and high impact relative to the coastal area of Rakhine. The Ayeyarwady Region is extremely flood-prone, and in recent years, the effects of the flood are becoming more severe, with longer duration of inundation. Floods damage houses and furniture, paddies, water sources, roads, schools, and monasteries, and it also has impact on ICH in the region. While the cost of the physical damage can be calculated, it is difficult to understand how great the impact of flooding is on ICH.

## STUDY AREA AND RESEARCH METHODS

Within the study area, discussions with local people, in-depth interviews with key informants and focus groups were conducted. The data for this study were gathered through purposive sampling, which is selected sampling of areas that have withstood natural disaster, such as cyclone- and flood-affected areas. Some parts of the Ayeyarwady Region are almost always experiencing flooding; therefore, general surveys were first conducted in selected villages of the townships (a township is an administrative subdivision in Myanmar, dividing a district) Thabaung, Kyaung-gon, Laputta, Ngaputaw, Kangyidaung and Mawlamyinegyun. Laputta and Mawlamyinegyun were affected by Cyclone Nargis in 2008. After a preliminary survey in these selected townships, Thabaung, where flooding takes place every year, was selected for in-depth study. In-depth interviews and focus groups interviews were conducted at the village tracts (a village tract is a rural

**Figure 1**
Focus group interview at Migaung kike Village, Gonhnyintan Village Tract, Thabaung (©Khin Kay Khaing, 2017)

administrative division in Myanmar equivalent to an urban ward; a village tract can be contained more than 100 villages) Okeshit, Gonhnyintan and Mazalikwinpauk, all in the township of Thabaung (Figure 1). An interview with a key informant and a focus group were also held at Nargis-affected areas of the village of Aleyekyaw in the township of Mawlamyinegyun and the village of Thin-gan-gyi in the township of Laputta. During all interviews and focus groups, notes were taken, and digital recording devices were used to record information, facts and figures.

All interviewees and focus group participants were of the Kayin and Bamar ethnic groups, and almost all were over 45 years old and native to the area. The villagers interviewed and participating in focus groups included farmers, religious leaders, retired teachers and NGO employees. They knew their villages well and had experienced a series of natural disasters in this area. Semi-structured questions related to natural hazards and disasters as well as to their religion, beliefs, customs, traditions and lifestyles were employed to interview the local people. More than 10 people actively participated in the interviews, and an average of almost 6 responded to questions in each sample village. A semi-structured focus group was conducted in the locales shown in Table 1, with the profiles of the interviewees. Figures 2 and 3 show selected townships in the Ayeyarwady Region.

**Table 1** Interviewee profiles

| Study area | Name of locales | Total number of Interviewees | Gender of interviewees | | | |
|---|---|---|---|---|---|---|
| | | | Males | Ages | Females | Ages |
| 1 | Okeshit (village tract) | 6 | 5 | 67, 70, 71, 69, 61 | 1 | 61 |
| 2 | Gonhnyintan (village tract) | 4 | 3 | 65, 54, 42 | 1 | 58 |
| 3 | Mazalikwinpauk (village tract) | 5 | 3 | 56, 59, 60 | 2 | 48, 61 |
| 4 | Thin-gan-gyi (village) | 7 | 5 | 55, 60, 60, 40, 48 | 2 | 45, 60 |
| 5 | Aleyekyaw (village) | 3 | 3 | 72, 45, 50 | - | - |

**Study Area 1 (Panpin-seik Village, Thabaung Township):** Panpin-seik Village is situated within Okeshit Village Tract, Thabaung Township in Ayeyarwady Region. It lies on the network of the creeks of Ngak-pauk Chaung, Kyein-ta-pin Chaung and Thabaung River, which flow into the Daka River. All these bodies of water affect this area by flooding during the monsoon period. Residents here depend on them to irrigate for the second crops cultivation after the monsoon and for fishing ; thus, they support the socio-economic condition of the local residents in this area. Therefore, the presence of these rivers has

both advantages and disadvantages. There are about 60 houses in Panpin-seik, and 90 households reside there. The majority of the people are Kayin, and they believe in Christianity. Their main occupation is agriculture and fishery.

**Study Area 2 (Miguaung-kike Village, Thabaung Township)**: The second study area, Miguaung-kike Village is within the Gonhnyintan Village Tract, in Thabaung Township. Similar to Panpin-seik Village, which lies on the network of Nga-pauk Chaung, Kyein-ta-pin Chaung (which are small creeks) and Thabaung Rivers. The main occupation of the villagers is agriculture, fishery and animal husbandry. The local people are of the Kayin ethnic group and believe in Christianity. In this village, there are about 128 households living in 125 houses.

**Study Area 3 (Hpan-ngar-gone Village, Thabaung Township):** The village of Hpan-ngar-gone, the third study area is located within the Mazalikwinpauk Village Tract of Thabaung Township. Tributaries of the Daga River cross its territory and flooding takes place every year. The main occupation of the local people is agriculture. This village has 353 houses and about 85% are of the Kayin ethnic group and 15% are Bamar. Only about 10% are Christians and the rest are Buddhist.

**Study Area 4 (Thin-gan-gyi Village, Laputta Township):** Laputta Township is situated in the lower Ayeyarwady Region, where Cyclone Nargis hit in 2008. The village of Thing-gan-gyi was completely devastated by Nargis and was moved to its present location. It is a fishing village. Before Nargis, there was a waterway from the Laputta to this village. Presently, road transport is possible to and from Laputta.

**Study Area 5 (Aleyekyaw Village, Mawlamyinegyun Township):** Before Cyclone Nargis, this village was part of the township of Laputta, but after Nargis it was transferred to the township of Mawlamyinegyun. Nearby villages were devastated by Nargis, but Aleyekyaw was not hit the worst.

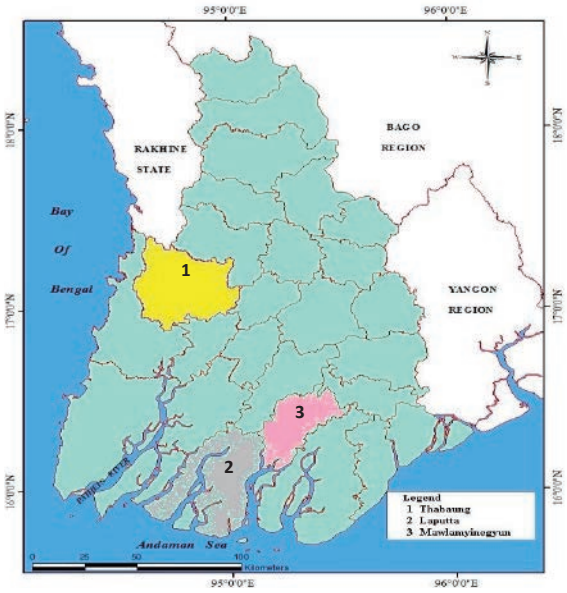


**Figure 2**

Location of the townships of Thabaung (1), Laputta (2), and Mawlamyinegyun (3) in the Ayeyarwady Region

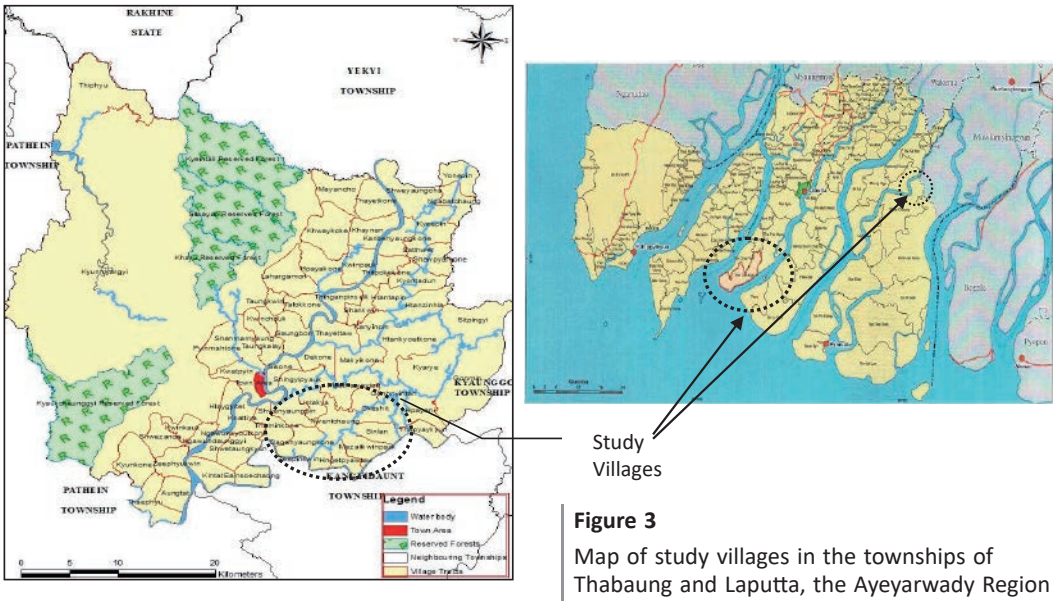


**Figure 3**

Map of study villages in the townships of Thabaung and Laputta, the Ayeyarwady Region

## NATURAL HAZARDS AND DISASTERS IN THE STUDY AREA

The Ayeyarwady Delta has historically experienced numerous natural disasters. As it is situated on the delta, the Ayeyarwady Region often experiences riverine floods and tropical cyclones. The region was affected by the 1974 Pathein Cyclone (303 dead, 10,191 cattle killed, 246,700 houses destroyed, estimated losses of 446.5 million kyat [DFID, 2009], the 2004 tsunami (10,000 houses destroyed, 40,000 acres of paddies flooded [Roussy, 2008], the 2006 Cyclone Mala (37 people dead, damages of 428.56 million kyat [DFID, 2009]), and the 2008 Cyclone Nargis (138,373 people missing or dead, 300,000 cattle killed, houses and over 4,000 schools in more than 6,000 villages destroyed, damage cost 13 trillion kyats [DFID, 2009]). Cyclone Nargis of May 2008 was the greatest devastation in the country's history, with a death toll of 140,000, according to official figures. Ayeyarwady Delta also experiences regular cyclones, although their effects are usually smaller in scale than those of Nargis. In 1991, the Hteinngu embankment, which was constructed in 1872 on the Ngawun River, a branch of the Ayeyarwady River, was breached between markers 19/6 and 19/7, near Hteinngu Village. The impact of the damage was disastrous: 1,146,000 ha of paddies, 68,000 ha of other crops and 74,740 houses flooded, 74,674 animals drowned and 326,926 people from 269 villages in 8 townships affected (Delta Alliance, 2015). Furthermore, Ayeyarwady Delta experienced severe floods in 2011, 2013 and 2015, as well as smaller flooding events in 2012 and 2016 (Foster, 2017).

In Thabaung Township, the tropical Pathein Cyclone in 1974 and Cyclone Nargis in 2008 have been the major events in memory; a severe storm wind of the latter of these killed a person. An earthquake occurred in 2006, and a person was killed in the township, crushed by a house. There have been no severe disasters in this area, beyond these. However, flooding occurs every year since 1988, and its effects are becoming more and more severe year after year. Due to natural and man-made processes, riverbank erosion is also prominent in some parts of the Ayeyarwady Region today. Local residents estimate that Thabaung Township has been experiencing flooding for 30 years. Due to its location in the lower portion of the delta region, near many streams, this flooding is not unusual. After

**Figure 4** Schools in Setdaunggyi Village, Thabaung Township in the 2016 flooding period (©Basic Education High School, Setdaunggyi Village, Thabaung Township)

**Figure 5** Pagoda and monastery in Htanzinhla Village, Thabaung in the 2016 flooding period (©Administrative Department of Thabaung Township)

1988, however, flooding there worsened, and it is becoming more and more of a disaster (Figures 4 and 5).

The lower part of the Thayat Chaung and Akai Chaung, both of which are small streams flowing across the Kangyidaung Township (once named Pathein East), was blocked for agricultural purposes by local residents living upstream. They built a small dam to protect the flooding in their agricultural land to intensify cultivation. Developments in infrastructure, such as the construction of road networks and flood-protection embankments may be also an issue for increased flooding in the Ayeyarwady Region. Flood-protection embankments in the northern villages of Thabaung have caused flooding in some areas in the lower part of that Thabaung. After 1988, the floodwater began to rise about two or three feet above the banks of the river and reach settlement and cultivation areas. The degree of flooding gradually increased, regularly reaching 2 m in recent years, and even 3 m. In the early 1990s, local residents faced 2 weeks of flooding, but over 30 years, flooding began to last for longer periods, from 3 weeks to even a month, and now flood durations reach 2 months. The most serious flooding occurred in 2004, 2012 and 2016. In those years, flooding occurred twice or three times a year. Such flooding is not

only related to the local rainfall but also to the climatic conditions in the upper Ayeyarwady River. If the northern part of Myanmar has heavy rainfall, the lower Ayeyarwady Region experiences flooding.

In 2004, the Hteinngu embankment broke, and the resultant prolonged flooding caused the complete displacement of the cattle owned by some farmers and killed 60% of cattle in the village of Hpan-ngar-gone; all the grazing lands were covered with water, and there was no food left to support the animals. Currently, farmers in this area cannot raise cattle because of the shortage in grazing land. Due to the necessity of preparing their houses for flooding and repairing them again when the water levels drop, cultivation is practised once per year, which has slowed the socio-economic development of the area. In some years, the flood plains have been entirely covered with sand, rendering it impossible to cultivate crops on it.

After the period of flooding, diseases, such as dengue fever, break out almost every year, because of the growth of the population of mosquitoes. In 2016, there was a mosquito outbreak, affecting some domestic animals (pigs and dogs). According to interviews with the locals, mosquito outbreaks can kill their pigs, so they used mosquito coils to protect them, sometimes placing their pigs inside mosquito nets. Local residents secured themselves from disease using traditional ways (burning turmeric powder for getting mosquitoes out) and using medicines from the healthcare centre.

## PERCEPTIONS OF LOCAL PEOPLE ON NATURAL DISASTER

Because locals in this area have had 30 years of experience of flooding, they are aware of how to adapt to it. They pay attention to the weather forecasts from the Meteorological and Hydrological Department over radio and television. If they learn that they can expect a flooding year, they prepare drinking water, purifying it in the traditional way, using alum and harvesting rain water. People living in flooding areas rebuild the floors of their houses and raise the floors of other buildings to a higher position, as flood levels have been gradually rising over the last 30 years. They employ water-resistant materials like bricks in their buildings, instead of using traditional wood and bamboo (Figure 6). Some schools, monasteries and churches must often be upgraded necessary due to flooding. Certain individuals are aware that flooding adds rich nutrients to the soil, which becomes more productive for crops when the water recedes. Water transportation becomes more convenient and favourable during flooding, because they can reach their exact destinations without walking, thanks to the higher water level; without it, it is difficult to arrive certain places, because of the muddy soil.

Some residents have recognised that the longer durations and higher levels of floods in recent years are due not only to the intensity in rainfall but to changes in the environmental conditions, such as the construction of dams and embankments. Myanmar has three distinct seasons: summer, the rainy season and winter (which are relatively cool but not cold). Local people are also aware of the changing climatic conditions, which are causing intense rainfalls without changing the amounts of total annual rainfall.

**Figure 6**

Photos showing the present house style in Thabaung Township.

People in flood-prone villages build their homes upon a higher platform. If they cannot afford to build a higher floor, they have to relocate their houses to safer areas (©Khin Kay Khaing, 2017)

## ASSESSMENT OF IMPACTS ON ICH

The majority of the people in the village tracts Okeshit, Gon-nyin tan and Hpan-Khar Gone in Thabaung Township are of the Kayin ethnicity, most of whom are Christians, although some are Buddhists. Therefore, most beliefs, customs and traditions inherited from their Kayin ancestors are related to Christianity and Buddhism. The most prominent natural disaster in these village tracts is flooding. In interviews, the festivals of the local people are mainly classified as either Christian or Buddhist. For Christians, celebration of Christmas, Easter, the Kayin New Year, Mary's Birthday and other religious festivals are traditional. Christmas and Easter are in the pre- and post-monsoon periods. Flooding during the monsoon period does not affect these festivals. However, Mary's Birthday must be celebrated in August, so it cannot be celebrated in these village tracts, due to flooding. At that time, the residents must go to other places, especially to Pathein, the capital of the Ayeyarwady Region. This causes a challenge to arise for the Christian Kayin here. Not every small village has a church. Those from villages without them may go to other villages that do have churches. There is also a chance for villagers to get together. However, whenever the river flood, it is difficult to go to church on Sundays. Sometimes, Christians worship in

a temporary place set up for the purpose, and sometimes they do it in the small school. For the Buddhist people, the flooding period from July to October includes certain special months, called *War-twin*. During which most people believed in Buddhism use to observe a Sabbath once every eight days (the *Outh-bote or Thi-la Pwe*), perform good deeds and offer things to the monks together (*Ah-lu*) at the *dhammayone* (a building for the community's religious centre and for other social activities) or at a monastery. Thus, these are special months for the social-religious activities of the Buddhist people. Many Buddhists organise and meet at the dhammayone or at the monastery, to do these activities, which create opportunities for the social cohesion and unity of the community, especially for the older people. Coincidently, the period of flooding and special months for Buddhism (*War-twin*) overlap in time, which causes difficulty for Buddhist residents. The flooding prevents people from gathering regularly, leading to a degradation of the cohesion of the community and diminishing religious values.

The main occupation of the villagers in this area is paddy cultivation. In the former times, other crops, like beans, pulses, chilli and other vegetables, were cultivated during the late monsoon period, thanks to the presence of favourable quantities of moisture in the soil after the rice was harvested in October or November. At present, only rice can be grown, because the duration of flooding is getting longer, and the ground is totally covered with water from July to mid-September, which leaves insufficient time for the cultivation of secondary crops. In 2017, flooding was prolonged, lasting until November, and farmers were not able to have a second harvest. Figure 7 illustrates the cropping calendar in flood-affected areas and the non-flooding areas in the Ayeyarwady Region.

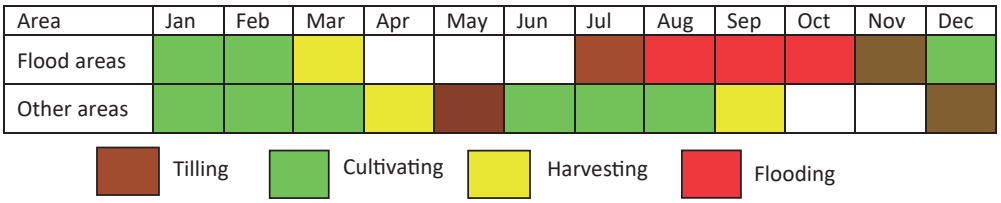


**Figure 7** Cropping calendar of flood affected areas and non-flooding areas

Black sticky rice is usually first cultivated in September or October and harvested after 3 to 4 months. Its cultivation enables traditional special snacks to be made for the locals and respect to be paid to the *Koe-myo-shin* spirit before and after *War-twin* (July and October). This is an important traditional custom that has existed since the time of the ancestors of the present inhabitants. They believe that this spirit helps socio-economic development of the people. Therefore, they must pay respect to it, offering it special snacks every year. At present, they cannot grow black sticky rice due to the prolonged flooding, and it is a long-duration species that takes about 3 to 4 months to be cultivated. After harvesting of paddy, they have no more time to cultivate this sticky rice species, again and they must buy it from nearby towns or other areas for this purpose.

Every year, in February, glutinous rice (*htamanae*) is cooked and offered to the monasteries and distributed in the neighbourhood. This is also one of traditional cultural practices in Myanmar. 30 years ago, when flooding was not so severe, this was a harvest time, and farmers were able to obtain money from their farm products. They could celebrate the traditional *htamanae* festival with great generosity with the first harvest of glutinous rice, peanuts and sesame. However, this festival is not be celebrated today, not only in the study

villages but other villages in the surrounding area; if it is carried out, it is reduced in scale.

An interview with a retired teacher provided evidence that almost all schools in the area closed during the flooding period, so students could not regularly attend the school. Although students are given supplementary classes after flooding, they never complete the school lessons for the academic year. This will have a serious impact for the education of future generations (Figures 4 and 8).

The most challenging events during flooding are funerals, because the entire cemetery is under water. This is a serious problem for both Buddhists and Christians. When a family member or relative passes away, people usually take care of the body within 3 to 5 days and they feel great sadness. Buddhists usually either cremate the body or bury it in or near the cemetery. However, they cannot do this as usual during flooding, as there is no ground space available, so they preserve the dead bodies until the flooding season is over, at which point they carry out their funeral. The Christians do not cremate the dead, because they believe that the person will be resurrected one day. Therefore, whenever they experience the death of a loved one, they tightly pack the body with plastic bags and put it on a shelf in the village or by the cemetery, where it is tied beneath the water to posts. After the flooding period, they bury the body in the cemetery, and this can be stress inducing. This problem remains to be solved.

The villagers of Thin-gan-gyi Village, Laputta Township, an area affected by Cyclone Nargis, experienced an increase in mental illness after they lost their family members and their properties in one day. Due to this experience, all social activities and culture affairs appear to diminish in value. During the post-disaster periods, some people who have lost their lands and jobs turn to drink, both males and females. The residents of this village are working to stabilise their socio-economic condition. This is because they were relocated from an old site that was totally destroyed by the cyclone to a new location, where they do not have sufficient facilities and job opportunities.

**Figure 8**
Temporary school in a relocated Nargis-affected village in Laputta Township (©Khin Kay Khaing, 2017)

## CONCLUSION

In the study area, both Buddhists and Christians have distinct festivals, activities, practices and beliefs. The results of interviews and focus groups suggest that some of cultural festivals, such *as Outh-bote* or *Thi-la Pwe*, and *Ah-lu* for Buddhists and *Su-taung Pwe* or Sunday schools for Christians have been gradually diminishing its value, due to prolonged and intense flooding, although they have not entirely disappeared. Buddhist people have gradually reduced their social cohesion in religious activities such as observing the Sabbath and offering flowers together to the monastery *dammayone*. Moreover, going to the monastery and the traditional practice of paying homage to the spirit is gradually waning today, due to the combined impact of modernisation and natural disasters. The Christians face difficulties when their loved ones die during the flood season. The duration of flooding is becoming longer and longer, and it is more and more difficult to safeguard people's common and habitual daily affairs. However, people have been living with flooding for more than 30 years and have the ability to adapt to it. However, it must be noted that they are not aware of what they are losing: traditions and part of their lifestyles; nor do they know what will happen in coming generations.

In conclusion, the Ayeyarwady Region experiences natural hazards such as cyclones (and storm winds) and floods and river bank erosion, which have had prominent effects on the tangible heritage of monasteries and churches, as well as on intangible elements such as agriculture, lifestyle, etc. In fact, tangible and intangible culture is closely related to each other, because certain aspects of intangible culture, such as social activities, traditions and customs rely on tangible culture. This paper was only able to assess the impact of natural disasters on the intangible culture of the people ofAyeyarwady Region in Myanmar, and a more detailed study, with a longer-term perspective, will be necessary.

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# ASSESSING THE CURRENT SITUATION OF ICH IN ASSOCIATION WITH NATURAL DISASTERS: PRELIMINARY FIELD SURVEY IN FOUR VILLAGES OF TOUNGUP, RAKHINE STATE, MYANMAR

Chan Myae Myittar Development Association (CMMDA)[1]

## BASIC INFORMATION ON THE AREA AND COMMUNITY EXAMINED

Rakhine is one of the least developed parts of Myanmar; it is characterised by high population density, malnutrition, low incomes, poverty, high risk of disaster and poor infrastructure. It is located on the northwestern coast of Myanmar and characterised by a contrast between the coastal plains and the Arakan Mountains in the east (Figure 1). This study was carried out in seven project villages in the township of Taungup (Table 1), where the Chan Myae Myittar Development Association (CMMDA) has ongoing work.

According to the 2013 administrative data for the township, 6,472 people are living in the seven project villages of Taungup, in 1,294 households. Each village is several hours away from Taungup, the closest larger city (27,477 inhabitants), by foot. With only 31 inhabitants per $km^2$, the township of Taungup has among the lowest population densities in Rakhine State.

Rakhine is a cyclone-prone area and the potential negative impact of natural disasters should be thoroughly monitored during monsoon season (from April to August) and prevented. CMMDA is currently considering starting a community-based disaster risk reduction programme in the target area. In the event of a natural disaster, CMMDA assesses whether humanitarian assistance is needed, and if it is, it will obtain assistance from international non-governmental organisations (INGOs).

CMMDA is currently implementing an integrated project focusing on nutrition and


**Figure 1**
CMMDA Head office at Yangon and Sub office location at Taungup, Rakhine State

1 Soe Thu and Thaw ZIn were interviewers and Zaw Moe and Aung Myat Kyaw compiled the report.

an integrated project on water and sanitation hygiene (WASH) in seven villages of Toungup. The seven villages are under the administrative control of six village tracts. Constrained by the availability of villagers and transportation facilities, CMMDA conducted field visits to four villages under four the administrative control of four village tracts. These villages were Kan Pyin, Zee Kwin, Tar Yae and Taung Ywar.

**Table 1** Number of inhabitants in the seven project villages

| Name of village | Inhabitants |
|---|---|
| Taung Ywar | 1,371 |
| Zee Kwin | 673 |
| Tar Yae | 1,553 |
| Thin Chi Gyne | 849 |
| Nga Lone Maw | 794 |
| Kan Pyin | 673 |
| Tae Mauk | 559 |
| **Total** | **6,472** |

(Source: Township General Administrative Department, 2013)

Tar Yae village is situated about 7 miles away from the town of Toungup. However, transportation between the two communities poses difficulties. Villagers must cross a small river by boat during the rainy season, and the current is strong. Tar Yae has no health centre despite its large population (over 1,500 people). Taung Ywar is the closest to the town of all the villages, at a distance of only 3 miles. However, these villagers must also cross a river to reach town. During the rainy season, the residents must cross the river in a small, locally made boat. From November to May, village residents can cross the river on the bamboo-wood, mixed-structure bridge, which was constructed by a private owner, paying a toll of 200 kyat for each passage. Kan Pyin village is 18 miles from the town and entirely surrounded by water. Zee Kwin village is situated beside the Taungup–MaEi highway road but is approximately 23 miles from town. None of the villages has electricity, and few have a solar system for lighting. However, each village possess an early childcare development centre. All villages have had access to mobile telephone communications since 2016.

Thanks to severe droughts between June and September, as well as the extreme rainfall of the rainy season from October to May, the climate is considered to be extreme, relative to global standards. The region is often hit by typhoons and floods. The state has around 3.2 million inhabitants in total, who mainly rely on rice cultivation and fishery. The average income is around 2.50 € per day.

Major disasters occur in the State from June to October. This is the rainy season, including the pre-monsoon (April–May), monsoon (June–October) and post-monsoon (November–December). Riverbanks collapse, landslides and heavy rains occur every year during the rainy season. All disasters, including storm, flooding and irregular rainfall, greatly affect the cultivation practices of the farmers. The cycle of rice cultivation in the region is as follows:

as soon as rainfall starts, in approximately June and July, farmers begin to grow rice seedlings. Around August, they move seedlings to larger fields to nurture and harvest the rice in November. Short-term rice varieties take around 120 days to grow, and long-term varieties take around 180 days. In this area, a 120-day variety is preferred. Generally, in Myanmar, rice cultivation season is rainy season, and this is also true during disasters. During this period, farmers must take the risk with their agricultural practice of losing their investment in planting due to natural hazards such as flooding, irregular rainfall and storms. However, they have no choice, because their main chance of income comes through cultivating rice. No farmer can afford to miss this period.

Rainfall is irregular in November, December and January, and this is when rice should be harvested. Most crops may be destroyed during this period due to irregular rainfall. Technology has thus been adopted that is locally friendly to planting and cultivating to reduce losses of crops. Nevertheless, updated technology is needed to sustain cultivation and harvest.

## INTERVIEW STRATEGIES

In this study, information was primarily collected through focus group discussions (FGD) and in-depth interviews (IDI) with local people. The participation of elders and youth was highly encouraged, and the gender balance was also considered. Semi-structured questionnaires were used that were created based on the guidelines provided by IRCI. In planning this study, the needs of local people and concerns regarding disaster risks and ICH safeguarding were fully considered. The survey team was two field assistants (FA). Before the beginning of the interview, FGD were introduced to the project, including IRCI, ICH and the objectives and goals of the activity by FAs. In total, eight FGDs and one IDI were conducted in the four villages Kan Pyin, Zee Kwin, Tar Yae and Taung Ywar. A summary of the FGD and IDI is shown in Table 2.

**Table 2** Summary of focus group discussions and in-depth interviews

| Name of village | Information-gathering means | # of participants | | |
|---|---|---|---|---|
| | | Men | Women | Total |
| Tar Ye | Focus group discussion (participants over 50 years old) | 5 | 3 | 8 |
| | Focus group discussion (participants under 50 years old) | 4 | 4 | 8 |
| | In-depth interview | 1 | 0 | 1 |
| Taung Ywar | Focus group discussion (participants over 50 years old) | 3 | 5 | 8 |
| | Focus group discussion (participants under 50 years old) | 3 | 5 | 8 |
| Zee Kwin | Focus group discussion (participants over 50 & under 50 years old) | 6 | 7 | 13 |
| Kan Pyin | Focus group discussion (participants over 50 & under 50 years old) | 7 | 7 | 14 |

## ANALYSIS OF THE DATA

### Understanding the Locality and Communities

#### *Geographical setting: natural and social environment, access to urban centres, information and other factors*

One of four villages is situated in the upland and the rest are in lowlands and on islands. The villagers from the three lowland villages suffer floods most years. All four villages suffer heavy rain, storms and floods in May, June and October and irregular rainfall from November to January.

In addition to these natural hazards, Zee Kwin has a history of cholera, because villagers did not have access to adequate water, no fly proof latrine and limited knowledge of water and sanitation. Cholera struck 20 years ago, and some villagers lost their lives. The village was relocated to a new site that was assumed to be free from the disease. After the cholera epidemic completed, the villagers returned. Tar Yae is the most severely affected by natural hazards and disasters, while Kan Pyin, Tar Yae and Taung Ywar have been less affected.

#### *Baseline information on communities, villages and settlements: populations, histories, economies, livelihoods and resources*

Summary of collected villages was shown in Table 3.

**Table 3** Information collected for the survey

| | Zee Kwin | Kan Pyin | Tar Yae | Taung Ywar |
|---|---|---|---|---|
| Ethnic group | Rakhine & Chin | Rakhine | Chin | Rakhine |
| Religion | Buddhist | Buddhist | Buddhist | Buddhist |
| Population | 736 | 690 | 1757 | 1300 |
| Vulnerable (children, mothers with children, pregnant women, elders and disabled) | 44.9728% | 41.159% | 45.8% | 35% |
| Youth under 18 | 289 | 206 | 723 | 420 |
| Children under 5 | 58 | 47 | 91 | 68 |
| Elderly | 40 | 70 | 70 | 30 |
| Pregnant women | 2 | 5 | 4 | 5 |
| Disabled | 0 | 3 | 7 | 0 |
| livelihood | Farmers, day labourers, wood/bamboo cutters, timber cutters | Farmers, fishermen, daily labourers | Farmers, wood/bamboo cutters, daily labourers | Farmers, fishermen, daily labourers |

| | | | | |
|---|---|---|---|---|
| Culture | Every boy must become a novice, no excuses, and gather together on the 1st day of the Myanmar new year | Has assembly on full moon day of *Tha-Din-Gyut** | Chin Cultural Committee holds meeting on Chin National Day (February 20) | Religious ceremonies such as *Kahtain** |
| Festivals | Buddha memories, Chin national day, *Thingyan**, serving food to *Ywar Daw Shin** (the spirit of the village) praying on the Tuesday before the monsoon | Festivals regarding Buddha, serving foods to *Ywar Daw Shin* | Festivals regarding Buddha, Chin national day, *Thingyan* (water festival) | Festivals regarding Buddha |

* *Tha-Din-Gyut* is a lighting festival in Buddhist culture, which usually happens on the full moon of the month of *Tha-Din-Gyut* (October). *Kahtain* is also a religious festival during the month of November. It was a festival of donation of monk's robe. *Thingyan* is a water festival in Myanmar culture. It usually lasts for 4–5 days and people throw water on each other with good cheer. It happens in April. At the festival of *Ywar Daw Shin*, one prays to the head of village spirits before farming activities.

### *Existing DRM plans for the area, local DRM groups or committees, and cultural heritage-management groups or committees*

The status of Disaster-management team is shown in Table 4.

One local NGO, the community development association, has begun working in disaster management in Tar Yae. This village thus has a DM team. There is a disaster-escape building in Tar Yae village built specifically for this purpose (30 feet long and 15 feet wide). However, there was no evidence that the escape building was actually used during a disaster. There was no evidence that the DM team of the village was active and functioning. Villagers needed to take care of the victims and help them to move their property using traditional methods of voluntary contribution of labour for rehabilitation and to secure dwellings to compensate for their losses, such as residences and house

**Table 4** Status of Disaster-management team

| | Zee Kwin | Kan Pyin | Tar Yae | Taung Ywar |
|---|---|---|---|---|
| Village-based disaster-management (DM) team | No | No | Yes | No |
| Presence of non-governmental organisation or international non-governmental organisation concerned with DM | No | No | Yes | No |
| Traditional method of DM | Yes, but lacking | | Yes, but lacking | Yes, but lacking |
| Own method for DM | Yes, but lacking | Yes, but lacking | Yes | Yes, but lacking |
| Disaster-escape building | None | None | Yes, good | None |

compounds. The other three villages mitigated their disasters in their own ways, using their traditional methods. However, the problem-solving methods used were different from village to village.

Methods of defecation, farming and cultivating methods, transportation methods, cultural worshipping, and methods for producing goods have been changed according to their experiences with daily challenges and frequent disasters. The fodder-storage system also changed from open-air storage to sheltered storage, due to the irregularity of the rainfall.

## Identifying Known Natural Hazards and Risks in the Area

Destroyed residence, homelessness, loss of property, disease and loss of domestic animals, disease and death of villagers and relocation of households are a prominent impact of natural disasters in the survey area. There were at least one or two occurrences of disaster per year. For natural disasters, the following local mitigation strategies were most often used:

- contribution of labour to affected families;
- preparation of shelters to prevent rain water;
- advance collection of needed materials, such as materials for ceremonies, and their storage in the village monastery;
- alerting or informing the community of the disaster through person-to-person communication and radio and TV news;
- using tractors instead of oxen in farming to finish planting and harvesting quickly;
- obtaining construction materials such as wood and bamboo from the village, for use in rehabilitation;
- donations from NGOs or INGOs, such as hygienic materials and kitchen sets are brought to assist others' rehabilitation after a disaster;
- raising rice storage above the highest water level; and

**Table 5** Varieties of natural hazards

| | Zee Kwin | Kan Pyin | Tar Yae | Taung Ywar |
|---|---|---|---|---|
| Heavy rain | √ | √ | √ | √ |
| Irregular rainfall | √ | √ | √ | √ |
| Storm | √ | √ | √ | √ |
| Heavy wind | √ | | | |
| Flooding | | √ | √ | √ |
| Landslide | | | √ | |
| Riverbank collapse | | | √ | |

- evacuating to the monastery, which is usually built in the highest part of the village and relocating one's cows to higher places.

## Identifying Local ICH in Association with Natural Hazards and Disasters

Religious, traditional and cultural activities that were not conducted as a result of natural hazards and disasters (Table 6) were as follows:

- ceremonies closely connected with village customs, such as novice ceremonies, could not be held;
- ceremonies were postponed;
- social cohesion and social relationships were lost due to natural hazards (according to village norms, villagers should participate in and help each other during festivals, but most villagers could not fully participate in festivals at the time of disaster, because they needed to focus on the safety of the crops they were harvesting); and
- everyone learned how to row, because of the disaster-prone nature of the village.

**Table 6** Natural disaster and ICH status

| Natural disaster (type) | ICH | Status | How to face | How to recover |
|---|---|---|---|---|
| Irregular raining and flooding | Traditional spiritual beliefs | happens every year | postpone | Family-level cooperation |
| Storm | Religious festivals | Yearly happened | postpone | Receiving help from the community |
| Heavy rain | Social festivals | Yearly happened | postpone | Receiving help from community |
| Storm | Village customs | Yearly happened | postpone | Getting help from community |

No evidence was found any combination of ICH related to natural disasters and scientific technologies. Traditional mechanisms of social cohesion were found in all four villages. These were generally based on village-level ceremonies, such as religious ceremonies and funerals. People met together, worked together and exchanged past knowledge and experiences. However, they did not speak of ICH directly, because it was a new concept for them, even when they spoke of it indirectly. Certain cultural traditions are maintained to the present time, most of which are related to religion. However, relative to changes in weather and natural disasters, some adjustments of time needed to be made for scheduling religious ceremonies. Many restrictive traditional rules sustained that cultural knowledge. The traditions of paying respect to God and/or goodness have gradually diminished. Many assets of tangible heritage are stored at monasteries, which are usually built on safer places, away from disaster-prone areas. Most monasteries are also built of wood and would not be destroyed by earthquakes, although earthquakes have not been identified as a disaster factor in these villages.

## Accessing Natural Disaster's Impact on ICH

Disaster can affect not only vulnerable groups, their livelihoods and their means of transportation but also their intangible culture. Buddhists usually keep the Sabbath from July to October, especially on full moon days. While there are traditional ceremonies in Myanmar every month, most of them occur during the rainy season. However, important religious festivals, such as Tha-Din-Gyut and Kahtain, are carried out immediately following the rainy season. Most of the novice festivals are usually conducted after harvest, because families have more income then. Such ceremonies are occasionally hit by irregular rainfall. Irregular rainfalls usually pose a challenge for traditional ceremonies, as well as for crop harvesting. Because the harvest period, ceremonies and irregular rainfalls all occur in the same time, participation in traditional ceremonies is reduced among the struggles and challenges. Residents prefer harvesting crops to ceremonies. They thus tend to postpone traditional ceremonies to times convenient to them. In this way, the cultural significance of traditional ceremonies will gradually wane. This may lead to a loss of social cohesion and transmission of local knowledge from the older to the younger generation.

## Additional Notable Issues Related to ICH

### *Concern of handicraft maker*

U Tun Hpe, who is 64 years old, lives in Tar Yae. His livelihood has hitherto relied on his practice of bamboo handicrafts. He has made baskets and products using bamboo since he was 35 years old. Although he was once able to make money from selling his handicrafts, he can no longer practice his arts, because of the scarcity of raw materials. This is due to changes in weather patterns, increases in the numbers of people living on bamboos and wood cutting, changes in national policy (Myanmar forest laws), and substitutions for bamboo products by plastic products, which began 10 years ago. He is afraid that his bamboo handicrafts might disappear. His business was inherited from his parents, but there is a scarcity of materials due to man-made forest depredation.

**REFERENCE**

Township General Administrative Department (2013). *Taungup Township Profile*. (Unpublished report for intra-department circulation)

**Annex:** Semi-structured questions for FGD and IDI (general and probing questions)

1) Understanding the locality and community
a) The geographical area:
• Your village is located in which territory, state or region?
• What is the natural environment and the social structure like?
• Do you have access to urban centres and information? If yes, which ones and how?
b) How many people live here: how many households and how many families? Who are they?
• How was your village established (when, by whom and how).
• What is the status of the economy?
• What is the main livelihood?
• What resources are available?
Note: if village has resource mapping, please take a photograph
c) Does the village have existing DRM plans? If yes, what are they? Do you have local DRM groups or committees or cultural-heritage-management groups or committees?

2) Identifying known natural hazards and risks in the area

a) What are the types of natural hazards in the area? (Which types? What severity? How frequent?)

- Is there any influence of climate change on your village? What is the evidence?

b) Local perception of natural hazards and disasters

- What do local people call disasters or hazards and risks?
- How do people think about disasters? What are its positive or negative aspects? What is considered a disaster? (Please give an example)

c) History of recent disasters that have affected the community

- Could you and your group explain the major effects and consequences of disasters?
- What are some environmental transformations triggered by a disaster?
- What are some social/cultural transformations triggered by a disaster?
- How is recover possible?
- What are the difficulties and challenges faced with regard to disaster?
- Please note a local DRR strategy that local people practice.

3) Identifying local ICH in association with natural hazards and disasters (ICH-based DRR/DRM)

a) What are some ICH-based DRR/DRM techniques (traditional indigenous knowledge and practice for DRR)?

- Could you please tell me, based on different types of disaster, when and how to prepare, how to face a disaster and how to rehabilitate from it?
- What kinds of knowledge and techniques are learned and how transmitted?
- What are the adaptive advantages?

b) Knowledge and techniques that were used in the past but are no longer in practice

- Are there any practices that were common in the past but are no longer used? What caused or contributed to the cessation of such practices?

c) Instances in which ICH is used in conjunction with introduced technologies: What are some instances of ICH in conjunction with scientific technologies?

d) Traditional systems or mechanisms of social cohesion and cooperation (within and between communities) contributing to DRM, including traditional social events and festivals

- Any local governance system used in preparation, response, and recovery?
- What kind of festivals and social meetings are held in villages?
- What are the roles of women, youth and the elderly in disaster preparation, response and recovery
- Please mention certain specific function and roles in the process of disaster

e) Memories of the disaster as ICH

- Could you please give sites or places and stories regarding the transmittal of memory or lessons of past disaster events
- Are there any other new stories, chants, songs or performances, and are there any other social practices that have emerged from recent disaster experiences? Why have they emerged?
- How they are performed and transmitted?

f) The community's priorities and willingness to promote such ICH-based DRR techniques

- What are the considerations of practicality and effectiveness regarding ICH-based DRR techniques
- Could you please identify positive and negative outcomes of the use or abandonment of particular techniques?

4) Assessing the impact of natural disasters on ICH (natural disasters as a factor threatening the safeguarding of ICH)

a) Representative ICH elements in the area

- What is the fundamental basis for people's identity and livelihoods and the community's solidarity?

- What are daily practices were related to ICH?
- What have been the temporary disturbance to natural resources, gardens and crops, damage to/loss of sites, facilities and tools to perform ICH?
- How deep and long-lasting was the impact? How were the ICH revived or transformed?

b) Indirect-impact and long-term transformations triggered by disasters

- How can raw materials (for houses, craft making, etc.) be replaced from traditional resources?
- Can natural disasters create opportunities for cultural change?