PRELIMINARY RESEARCH ON ICH SAFEGUARDING AND DISASTER RISK MANAGEMENT IN THE ASIA-PACIFIC REGION

PROJECT REPORT FOR FY 2016-2017

International Research Centre for
Intangible Cultural Heritage
in the Asia-Pacific Region (IRCI)

United Nations
Educational, Scientific and
Cultural Organization

Intangible
Cultural
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PREFACE

The International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI) was established in 2011 within the National Institutes for Cultural Heritage (NICH), Japan, as a Category 2 Centre under the auspices of UNESCO. Since its establishment, IRCI has been working extensively to enhance research for the safeguarding of intangible cultural heritage (ICH) in the Asia-Pacific region through implementing research projects in cooperation with research institutes, museums, NGOs, and government sections within and outside the region.

This project, 'Preliminary Research on ICH Safeguarding and the Disaster-Risk Management in the Asia-Pacific Region' commenced in April 2016, as one of the core projects under IRCI's Medium-Term Programme for Fiscal Year 2016–2020. As the first step to investigate this new research theme, the project started with a number of activities focused on understanding the current situations of natural disaster risk management and ICH safeguarding in the Asia-Pacific region, and developing a cooperative network of researchers for the project. These project activities were implemented in close cooperation with Tokyo National Research Institute for Cultural Properties, a research institute under NICH, which has become one of the first successful inter-organisational collaboration models within NICH.

It is a great pleasure to present this project report on the results of our two-year long preliminary research activities, which includes contributions from many researchers in the Asia-Pacific region. Within these few years, there have been many developments in disaster risk management (DRM) and ICH, such as the discussions on 'ICH in emergencies' during the 11th and 12th sessions of the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage. I hope that this publication can inspire additional studies and programmes associated with ICH and DRM, and contribute to the promotion of the Convention for the Safeguarding of the Intangible Cultural Heritage.

This project was made possible by funds donated to NICH for the protection of cultural heritage (for 2016–2017), with some of the activities in 2016 also being financially supported through the official development assistance (ODA) grant for supporting UNESCO's activities by the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

Thank you all for your generous cooperative efforts in this project, and I hope you continue to support forthcoming projects of IRCI.

Wataru Iwamoto
Director-General
International Research Centre for Intangible
Cultural Heritage in the Asia-Pacific Region (IRCI)

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ACRONYMS AND ABBREVIATIONS

DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ESD	Education for Sustainable Development
ICH	Intangible Cultural Heritage
IPCC	Intergovernmental Panel on Climate Change
IRCI	International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region
PDNA	Post Disaster Needs Assessment
SDG	Sustainable Development Goals
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISDR	United Nations International Strategy for Disaster Reduction
2003 Convention	Convention for the Safeguarding of the Intangible Cultural Heritage

PRELIMINARY RESEARCH ON ICH SAFEGUARDING AND DISASTER RISK MANAGEMENT IN THE ASIA-PACIFIC REGION: PROJECT SUMMARY

PRELIMINARY RESEARCH ON ICH SAFEGUARDING AND DISASTER RISK MANAGEMENT IN THE ASIA-PACIFIC REGION: SUMMARY OF ACTIVITIES IN FY 2016–2017

International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI)

PROJECT BACKGROUND

'Preliminary Research on ICH Safeguarding and Disaster Risk Management in the Asia-Pacific Region' started in April 2016, as a new research project under the new Medium-Term Programme (FY 2016–2020) of the International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI).

The project specifically focused on aspects related to natural hazards because in the Asia-Pacific region, a great number of countries frequently suffer severe events. Cyclones/typhoons, floods, earthquakes, tsunamis, drought and volcanic eruptions sometimes bring about disastrous consequences for these countries' peoples. Thus, natural hazards and disasters[1] are considered a factor threatening the viability of Intangible Cultural Heritage (ICH).

International awareness concerning protecting and safeguarding cultural heritage against disasters has been growing. UNESCO's Medium-Term Strategy for 2014–2021 (37C/4) emphasises the urgent need to respond to post-conflict and post-disaster situations (PCPD) (UNESCO 2014), and the UN's Sendai Framework for Disaster Risk Reduction 2015–2030 also calls for protection of cultural heritage (UNISDR 2015). However, while both domestic and international efforts have been increased for protecting and rescuing cultural heritage affected by severe disasters, such activities largely center on 'tangible' heritage while impacts on 'intangible' cultural heritage (ICH) are frequently overlooked. In the UNESCO policy framework for ICH, Operational Directives for the Implementation of the Convention for the Safeguarding of Intangible Cultural Heritage added a new paragraph on

1 According to UNISDR (2009), 'disaster' is 'a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources', resulting from 'the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences'. In this sense, a commonly used term 'natural disaster' is somewhat misleading because a disaster happens when natural hazards intersect with various human factors.

'Community-based resilience to natural disasters and climate change' (VI.3.3), reflecting the discussion on ICH and sustainable development (UNESCO 2016). Since 2016, the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage has also discussed this issue under the theme of 'Intangible cultural heritage in emergencies'.

Major disaster risk reduction (DRR) and management (DRM)[2] strategies and frameworks have not succeeded in effectively incorporating cultural dimensions; too, cultural sectors' active commitment to DRR and DRM programmers remains limited. However, it is significant that recent PDNA (post-disaster needs assessment) programmes in the Asia-Pacific region have started to include assessment of culture.[3] In contrast, DRM specialists have shown growing interest and effort to integrate traditional indigenous knowledge within DRR strategies (e.g., Dekens, 2007; Mercer et al., 2010; Shaw et al., 2009). Indigenous knowledge, sometimes referred to as local knowledge, is 'the understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings'. For rural and indigenous people, it 'informs decision-making about fundamental aspects of day-to-day life' and 'provide[s] a foundation for locally appropriate sustainable development' (UNESCO, n.d.). Such knowledge consitutes part of ICH, and at this intersection, we envisage a potential ICH contribution to DRM.

This project commenced against such a background, with a preliminary round of research activities. As a category 2 centre under the auspices of UNESCO, hopefully, this project will contribute to UNESCO for enhancing ICH safeguarding in the Asia-Pacific region, and especially for strengthening the community's resilience to disasters.

ACTIVITIES IN FY 2016–2017

The project had two main interest areas: 1) understanding the impact of natural disasters on ICH, and, by extension, a consideration of effective measures for ICH safeguarding, and 2) highlighting active roles of ICH for DRR and DRM.

As the project started in April 2016, IRCI established a cooperative relationship with the Tokyo National Research Institute for Cultural Properties, particularly with its ICH Department, which has experience of heritage rescue programmers after the Great East Japan Earthquake in 2011. Accordingly, various project activities were implemented in close cooperation with the Institute.

Within two years during FY 2016–2017, IRCI undertook activities as summarised in Table 1.

2 UNISDR (2009) defines 'disaster risk reduction (DRR)' as 'the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events', whereas 'disaster risk management (DRM)' is 'the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies, and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster'. Although they are used almost interchangeably, DRM could be viewed as the actions that aim to achieve the objective of DRR (PreventionWeb 2015).

3 In Samoa after Cyclone Evan (Government of Samoa, 2013), Vanuatu after Cyclone Pam (Government of Vanuatu, 2015), Fiji after Cyclone Winston (Government of Fiji, 2016), and in Nepal after the 2015 earthquake (Government of Nepal, 2015).

Table 1 Activities in Preliminary Research on ICH Safeguarding and Disaster Risk Management in the Asia-Pacific Region FY 2016–2017

FY 2016	
1 April 2016	'Preliminary Research on ICH Safeguarding and Disaster Risk Management in the Asia-Pacific Region' began
1 July 2016	First Working Group Session (Tokyo National Museum)
4–7 July 2016	Reconnaissance in Manila, the Philippines
20–22 October 2016	Reconnaissance in Port Vila, Vanuatu
24–26 October 2016	Reconnaissance in Suva, Fiji Participated in 'Pacific Platform for Disaster Risk Management' Conference in Suva, Fiji
11 November 2016	Second Working Group Session (Tokyo National Institute for Cultural Properties)
14–20 December 2016	Reconnaissance in Hue, Hoi An, and Ha Noi, Viet Nam
30 January 2017	International Working Group Session (Third Working Group Session) (Tokyo National Museum)
31 January 2017	Follow-up meeting with Working Group participants in preparation for FY 2017 activities
14–17 February 2017	Reconnaissance in Majuro, Marshall Islands
13–17 March 2017	Reconnaissance in Yangon, Mandalay, Bagan, and Inle Lake, Myanmar
FY 2017	
3 July 2017 -	Case studies assessing the current ICH situation in association with natural disasters proceeded under contract with researchers in Myanmar, Viet Nam, and the Philippines.
19–23 July 2017	Field survey on Gaua, Banks Islands in Vanuatu, in cooperation with Vanuatu Cultural Centre
26–30 September 2017	Field survey in Ra Province in Viti Levu, Fiji, in cooperation with iTaukei Institute for Language and Culture, and Blue Shield Pasifika
25–31 January 2018	Field survey in Abra and Ifugao in the Philippines, in cooperation with NCCA
25 January 2018	Case studies by collaborating researchers submitted to IRCI
20 March 2018	Final Working Group Session

Reconnaissance Survey in Asia-Pacific Countries in FY 2016

The first required step was to gain basic understanding of DRM in the Asia-Pacific region, how ICH is affected by various disasters, and active ICH roles for DRM. At the same time, developing cooperative relationships for implementing various project activities was critical. Therefore, IRCI sent researchers to selected countries in Asia and the Pacific to have discussions with researchers, specialists and government officials in fields related to DRM

and/or cultural heritage. While we were interested in finding some instances in which ICH was either damaged by a disaster or contributed to DRM, understanding social and cultural interests among those in DRM studies was also very important, along with heritage researchers' interests in examining ICH in the context of natural hazards and disasters.

Countries and organisations visited in FY 2016 are as follows:

Philippines (Metro Manila, 4–7 July 2016)
Researchers sent by IRCI: Yoko Nojima (IRCI); Tomo Ishimura (Tokyo National Research Institute for Cultural Properties)

List of organisations visited: University of the Philippines-Diliman (Department of Anthropology; Archaeological Studies Program); Center for Disaster Preparedness; National Commission for Culture and the Arts (NCCA); Oscar M. Lopez Center; Manila Observatory

Vanuatu (Port Vila, 20–22 October 2016)
Researchers sent by IRCI: Yoko Nojima (IRCI); Meredith L. Wilson (Stepwise Heritage and Tourism, Australia)

List of organisations visited: Climate Section, Ministry of Climate Change; Erromango Cultural Association; Lelema World Heritage Committee; National Disaster Management Office (NDMO); Vanuatu Cultural Centre (VCC)

Fiji (Suva, 24–26 October 2016)
Researchers sent by IRCI: Yoko Nojima (IRCI); Tomo Ishimura (Tokyo National Research Institute for Cultural Properties)

List of organisations visited: Fiji Museum; iTaukei Institute of Languages and Culture; National Disaster Management Office (NDMO)

*Researchers also participated in the 'Pacific Platform for Disaster Risk Management' Conference held by UNISDR during 24–26 October 2016.

Viet Nam (Hue, Hoi An, and Ha Noi, 14–20 December 2016)
Researchers sent by IRCI: Yoko Nojima (IRCI); Hiromichi Kubota (Tokyo National Research Institute for Cultural Properties)

List of organisations visited: University of Social Sciences and Humanities, Vietnam National University (Department of Anthropology); Hue University of Sciences (Department of Sociology); Hanoi University of Natural Resource and Environment; Hoi An Center for Cultural Heritage Management and Preservation; Hue Monuments Conservation Centre; Hue University of Agriculture and Forestry; Institute of Human Geography, Vietnam Academy of Social Sciences (VASS); Institute for Social and Environmental Transition (ISET)-Vietnam; Vietnam Institute for Culture and Arts Studies (VICAS); Vietnam Museum of Ethnology

Marshall Islands (Majuro, 14–17 February 2017)
Researchers sent by IRCI: Yoko Nojima (IRCI); Huy Nguyen (ISET-Vietnam)

List of organisations visited: Environmental Protection Authority (EPA); Chief Secretary's Office; Waan Aelõñ in Majel (WAM); National Disaster Management Office (NDMO); USP Center

Myanmar (Bagan, Inle Lake, Mandalay, and Yangon, 13–17 March 2017)
Researchers sent by IRCI: Meredith L. Wilson (Stepwise Heritage and Tourism, Australia); Shigeaki Kodama (National Museum of Ethnology)

List of organisations visited: University of Yangon (Department of Anthropology; Department of Archaeology); Group of Geographers (from Pathein University, Taunggyi University, and Yangon University); Intha Literature, Culture, Development Association; Ministry of Culture (Archaeology Department; Bagan Branch); MKRC&WKRC/SEEDS Asia Myanmar Office; Myanmar Engineering Society; Myanmar Upper Land; National Museum; SEAMEO CHAT; UNDP Myanmar Office; University of Mandalay (Department of Anthropology; Department of Archaeology); Yangon Heritage Trust

Through discussions with both DRM and heritage researchers, the general situation of ICH in relation to DRM was recognised.

1) Because many Asia-Pacific countries are frequently exposed to various natural hazards, heritage researchers, and specialists are very keen to understand ICH in relation to DRM. However, most existing efforts to protect heritage from hazards and disasters are made for 'tangible' cultural heritage, whereas examining the situation of ICH in this context was recognised as a new approach to be developed.

2) Governmental culture sectors and museums are interested in this approach and find it significant for enhancing the country's ICH safeguarding, but natural hazards and disasters do not necessarily take top priority in heritage management. Part of these entities' understanding is 'Yes, we need to protect ICH from natural disasters, but the challenge is how to achieve this goal'. Discussion with IRCI for this project provided an opportunity to start thinking about what we can do in the area of ICH.

3) DRM research and practices are dominated by science and technology approaches, and in most cases, culture is not part of them. However, some researchers are trying to incorporate 'indigenous knowledge' for DRM. Some examples are the use of traditional architecture (e.g., local materials enable faster recovery, structural characteristics withstand disasters), traditional hazard indicators, and food preservation techniques. These are all ICH, even though DRM researchers have not used this terminology.

4) The 'indigenous knowledge' exemplified above is recognised as the intersection of ICH and DRM. Some ideas emerged during discussions: The culture sector could promote such positive aspects of ICH through museum exhibitions and educational materials by making use of their existing collections.

Working Group Sessions

In FY 2016, IRCI also held a series of working group sessions, inviting researchers from related fields as guest speakers to explore the potential of various approaches and to discuss issues related to ICH and disasters, while familiarising ourselves with cultural approaches for DRM.

On 1 July 2016, at the Tokyo National Museum, the first working group listened to Professor Hiromu Shimizu of Kyoto University share his experiences during the Pinatubo eruption in the Philippines and transformation of Aeta societies based on his long-term research. Considering the ICH focus of IRCI, he added a brief presentation introducing his research in Ifugao. His presentation was timely because the session was held a few days before IRCI's first trip to the Philippines. Especially for the beginning of exploring ICH approaches for DRM, his talk was insightful in emphasising that culture is always changing and that a disaster becomes an opportunity for cultural change that often involves certain creative aspects during the recovery process.

On 11 November 2016, at the Tokyo National Research Institute for Cultural Properties, the second working group session invited Professor Isao Hayashi of National Museum of Ethnology, Japan, who talked about the culture to cope with disasters, or 'disaster culture', referring to several cases in Japan, Indonesia, and Papua New Guinea. Introducing the concept of 'indigenous knowledge', his presentation encouraged us to explore how ICH contributes to DRM. Notably, he indicated the major functions of disaster culture to be protecting people, transmitting the memory of disaster to following generations and healing the minds of the affected. This could be applied to ICH as well.

On 30 January 2017, at the Tokyo National Museum, the third working group session was convened as the 'International Working Group Session', with presenters invited from Asia-Pacific countries. Dr Rajib Shaw, DRM specialist at IRDR, was the guest lecturer delivering a talk on science and technology gaps and indigenous knowledge, extensively referring to various case studies in the Asia-Pacific region. The session also provided us a great opportunity to learn DRM viewpoints for indigenous knowledge and ICH. Eight Asia-Pacific participants shared information on current DRM and heritage situations, with their experiences in Bangladesh, Fiji, the Philippines, and Vanuatu, respectively. This full-day event provided an opportunity for Asia-Pacific researchers in both culture and DRM fields to gather for active discussions on ICH in the DRM context. On the following day, possible project activities for FY 2017 were casually discussed among Asia-Pacific participants.

Records of these three working group sessions are included in this volume. For the first two sessions, we provided lecture summaries because the original talk was in Japanese, and the lecture, participants' presentations and discussions were transcribed for the International Working Group Session.

Field Research in FY 2017

In 2016, IRCI's activities, which primarily involved discussions with related institutions and researchers, helped capture the current DRM/DRR situation, possible disaster impacts on culture and ICH's potential roles for DRR. However, assessing the situation at the local, community level is necessary for developing effective strategies and action plans allowing

future integration of ICH into DRR/DRM. Therefore, activities for FY 2017 focused on field research to assess current ICH situations in natural disasters by interviewing local people and ICH practitioners living in disaster-prone or disaster-affected areas, paying special attention to remote, rural areas. Specific areas for the case study were determined in close communication with project counterparts in given countries.

Goals of the field research were as follows:

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

2) Identify the impact of natural disasters on ICH

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

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

The researchers' network, established in FY 2016, was highly beneficial in identifying cooperating/collaborating partners; this action enabled effective implementation of a survey exploring various cultural and disaster settings in five Asia-Pacific countries. Three field research activities involving IRCI researchers were conducted in Vanuatu, Fiji, and the Philippines. In addition, collaborating researchers independently undertook six case studies in Viet Nam, Myanmar, and the Philippines.

To facilitate the survey and interview process, IRCI developed common guidelines (Table 2), which were used for all field research. These guidelines attempted to include major issues related to ICH and natural disasters; however, because of the project's preliminary stage and a limited timeframe for field activity, thoroughly covering all guideline items was not intended. Alternatively, each case study addressed aspects fitting specific field conditions and maintained overall goals to identify impacts on ICH, and active roles of ICH.

Table 2 Assessing the Current Situation of ICH in Association with Natural Disasters: Guidelines

1) Introduction to the project
a) About IRCI and ICH
* Introduce IRCI
- Category 2 Centre under auspices of UNESCO, established in 2011 in Japan
- Mission: Contribute to the UNESCO Convention for the Safeguarding of Intangible Cultural Heritage through facilitating research for ICH safeguarding in the Asia-Pacific Region
- Activity Focus on 'ICH safeguarding and disaster risk management' under its medium-term programme (2016–2020)
* Explain ICH
- UNESCO's categories: a) oral traditions and expressions; b) performing arts; c) social practices, rituals and festive events; d) knowledge and practices concerning nature and the universe; e) traditional craftsmanship
- Note that ICH here is not limited to the elements that are inscribed on the UNESCO representative list, but includes any knowledge, skills and practices that are held and transmitted by people from generation to generation, and are part of their culture and livelihood.

* With respect to natural disasters, ecological and environmental knowledge (e.g. traditional resource management) is important.

b) Why ICH for DRR/DRM
* Natural disasters as a potential factor threatening the transmission of ICH:
  - Directly damage places and objects associated with ICH practice; natural resources required for ICH (e.g. local craft production)
  - Indirect impact: transformation of lifestyles affecting ICH (e.g. local materials and techniques replaced by commercial materials and technologies)
* ICH has significant roles to play in community-based DRM process (positive roles of ICH)
  - Importance of indigenous knowledge and practice (built upon generations of experiences)
* Note that a natural hazard only become a disaster when the affected people and communities are vulnerable. While cultural factors may be part of vulnerability, they also contribute significantly to DRR. In this respect, ICH may be able to strengthen community resilience in self-sustainable ways.

c) Objectives and Goals of the activity
* Understanding the situation of ICH in relation to natural disasters
* Recognizing the importance/significance of ICH in the process of DRR against natural disasters
* Discuss with the local community and counterparts possible ways to strengthen disaster-related ICH, and to incorporate such elements into their own DRR/DRM actions

2) Understanding the locality and community situations

a) Geographical settings of the area: natural and social environment, access to urban centres, information, etc.

b) Baseline information of the community/village/settlement: population, history, economy, livelihood, resources, etc.

3) Identifying known natural hazards and risks in the area

a) Varieties of natural hazards (types, severity, frequency)
* Be aware of slow-onset hazards such as droughts, or ENSO-related climatic extremes
* Any influence of climate change?

b) Local perception of natural hazards and disasters
* Local terminologies (when appropriate)
* What is considered a disaster? Any positive aspects?
  (e.g. River flooding accumulates fertile soils for agriculture and is not necessarily a disaster.)

c) History of recent disaster events that have affected the community
* What were the major impacts/consequences?
* Any environmental/social/cultural transformation triggered by the disaster? (Loss of resources, places, relocations, etc.)
* How did they recover?
* Difficulties and challenges they faced
* Any local DRR strategy used? (related to section 4 below)

d) Assess the community's risks and vulnerabilities (based on sections 2 and 3).

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

a) Map ICH-based DRR/DRM techniques (traditional indigenous knowledge and practice for DRR)
* Maybe easier to do this with respect to each disaster type and asking how the locals prepare for, confront, and recover from the disaster.
* How such knowledge and techniques are learned and transmitted?
* Whether certain practices have changed due to adaptive advantages

b) Knowledge and techniques that were used in the past but no longer in practice
* What caused/contributed to the cessation of such practice?

c) Instances in which ICH is used in conjunction with introduced (scientific) technologies

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

* Local governance arrangements used in preparation, response, and recovery, and the roles of women, youth and the elderly
* Specific function and roles in the process of disaster

e) Memories of the disaster as ICH
* Sites/places and stories transmitting the memory/lessons of past disaster events
* New stories, chants, songs or performances, and other social practices that are emerged from recent disaster experiences, and why they emerged
* How they are performed and transmitted?

f) Community's priorities and willingness to promote such ICH based DRR techniques
* Consideration of practicality, effectiveness, etc.
* Ask people to identify positive/negative outcomes when particular techniques are used/not used.

5) Assessing natural disasters' impact on ICH (natural disasters as a factor threatening the safeguarding of ICH)

a) Representative ICH elements in the area
* They may not be directly related to disasters, but would constitute fundamental part of the people's identity, livelihoods, and community's solidarity.
* Note that all categories of ICH (according to the definition of UNESCO) are introduced to the community for consideration.
* Also note the importance of daily subsistence practices and resource management strategies with its close connection to the cultural landscape. (Elements that are part of their daily lives may be overlooked.)

b) Instances in which ICH practices were interrupted by disasters (with reference to recent disaster events)
* Temporary disturbance to natural resources, gardens and crops, damage to/loss of places, facilities, and tools to perform ICH, etc.
* Duration of the impact, and how they revived/transformed.

c) Indirect-impact and long-term transformation triggered by disasters
* e.g. replacement of raw materials (for houses, craft making, etc.) from traditional resources to imported commercial products may lead to the decline/loss of traditional knowledge and practices
* Note that natural disasters create opportunities for cultural changes. ICH in general is often under the endangered situation due to other common factors such as globalization, industrialization, and modernization. A disaster event that happens in such circumstances may lead to considerable transformation of ICH, especially in the process of recovery.

Supplement: When prominent ICH practitioners are available (e.g. wood carvers, potters, weavers, performers, etc.), information regarding the disaster-impact may be collected through additional, separate interviews.

a) Whether any past disasters interrupted the practice or not. If so, how it happened (what were damaged/lost) and how long it was interrupted.
b) Risks and concerns they have (in relation to, but not limited to natural disasters).
c) Transformation of ICH and its transmission before, during, and after the disaster. Did a disaster event contribute to the decline of the tradition?

IRCI undertook the following three field studies:

Gaua (Banks Islands), Vanuatu (19–23 July 2017)
Counterpart: Vanuatu Cultural Centre

Researchers sent by IRCI: Yoko Nojima (IRCI); Meredith L. Wilson (Stepwise Heritage and Tourism, Australia); Edson Willie (Vanuatu Cultural Centre)

Focus: Gaua is an island with an active volcano, Mt Garet. The latest eruption in 2009–2010 forced the locals living on the western and northwestern sides of the island to evacuate to other parts of the island for about 6 months. The Banks Islands are one of the most isolated areas in Vanuatu, and the local people's livelihood is largely based on subsistence agriculture. These islands are also known for their distinctive cultural expressions. Researchers expected that the people retained rich knowledge for dealing with various natural hazards, including volcanic eruptions and tropical cyclones.

Naocobau and Namarai villages, Ra Province, Viti Levu, Fiji (26–30 September 2017)
Counterpart: Blue Shield Pasifika/Fiji Museum; iTaukei Institute for Language and Culture

Researchers sent by IRCI: Yoko Nojima (IRCI); Tomo Ishimura (Tokyo National Research Institute for Cultural Properties); Elizabeth F. D. Edwards (Blue Shield Pasifika/Fiji Museum); Ilaitia Senikuraciri Loloma (iTaukei Institute for Language and Culture)

Focus: These two villages were devastated by Tropical Cyclone Winston in February 2016. Therefore, the research specifically focused on villagers' experiences of Winston, its impact on their ICH, and the situation of ICH during the recovery process.

Abra and Ifugao, Cordilleras Region, Philippines (25–31 January 2018)
Counterpart: National Commission for Culture and the Arts (NCCA)

Researchers sent by IRCI: Yoko Nojima (IRCI); Tomo Ishimura (Tokyo National Research Institute for Cultural Properties); Cecilia V. Picache (NCCA); Norma A. Respicio (University of the Philippines-Diliman)

Focus: Indigenous peoples live on both Abra and Ifugao, and researchers intended to understand hazards and ICH situations among communities in mountainous areas. The Ifugao possess both World Heritage sites and ICH elements inscribed in the list of the 2003 Convention of UNESCO; thus greater awareness concerning their ICH and its safeguarding are expected.

Collaborating researchers conducted case studies as follows:

Batangas, Philippines by Soledad N.M. Dalisay (University of the Philippines-Diliman)

Ayeyarwady region, Myanmar by Khin Kay Khaing (Pathein University)

Rakhain state, Myanmar by Chan Myae Myittar Development Association

Bac Ha region (Lao Cai), Viet Nam by the Centre for Advanced Research on Global Change (CARGC), Hanoi University of Natural Resources and Environment

Black Hà Nhì and Red Dao Communities (Lao Cai), Viet Nam by Phan Phuong Anh (University of Social Sciences and Humanities, Vietnam National University)

Bo River basin (Hue), Viet Nam by Le Van An and Ngo Tung Duc (Hue University of Agriculture and Forestry)

The final portion of this project report ('Assessing the Current Situation of ICH in Association with Natural Disasters: Case Studies') includes these case study reports.

SUMMARY AND PROSPECTS

During the past two years, our study identified several points associated with ICH. Major damage caused by disasters is as follows:

- Important places associated with oral traditions, ritual performances, social activities, and subsistence practices such as gardens and fishing places could be damaged or lost.
- Tools and equipment required for performing arts, rituals, festive events, and subsistence practices could be damaged or lost.
- Natural resources required for craft production, for instance, weaving, basket making, and pottery making, could be depleted or lost, leading to interruption and recession of practices.
- Disaster relief and aid items from outside sometimes disturb or replace local practices.
- Social events, ritual events, and ceremonies may be postponed or cancelled.

In some cases, positive sides of natural hazards were noted:

- In river basins and deltas in Southeast Asia, moderate flooding is part of subsistence systems—not considered disasters.
- In the Pacific, the local people can sometimes gain unusual fish harvests and excellent crop harvests.

Positive aspects of ICH include the following:

- Local knowledge systems associated with nature and the environment, including local resource management, conserve their environment and also protect from natural hazards. Traditional hazard indicators enable the local people to prepare in advance.
- Having environmental knowledge enables people to build their villages and houses in safer locations.
- Traditional houses have abilities to withstand major hazards. Traditional local houses utilising local materials are strong against cyclones and earthquakes. In Gaua, Vanuatu, thatched roofs last longer than corrugated iron roofs against volcanic ashfall. Houses in Viet Nam's mountainous areas protect people against cold weather. Houses along rivers in Southeast Asia are equipped with systems to reduce the impact of floods. Certain houses function as shelters during disasters.
- Traditional food preservation techniques and the knowledge of wild 'bush' food could increase food security.
- Memories of past disasters are transmitted as epics and songs, sometimes associated with particular places and monuments.
- Rituals are performed to mitigate risks or to avoid disasters. Such practices may not

be scientific, but are important in the community and function well to maintain social order.

- After the 2011 earthquake and tsunami in Northeast Japan, reviving local festivals and performances assisted the community's recovery.

In fact, rich knowledge exists concerning hazards and disasters, and it is effective for DRR. Possibly the biggest problem, however, is that such knowledge is no longer practiced in the contemporary context. Thus, the problem lies in transmitting such knowledge. Furthermore, recent introduction of the DRM framework and strategies intended to increase communities' DRM abilities are generally top-down; they sometimes override existing practices. Recognising and utilising local knowledge effectively is important for enhancing communities' resilience.

While disasters certainly impact ICH, it seems unlikely that the disaster itself leads directly to loss of ICH. Even before disasters, many ICH elements are already endangered because of long-term processes of modernisation and 'development'. In such a context, a disaster could easily lead to the loss of ICH. Recognising that ICH is always changing, disaster events are that happen at the edge of this process, and thus long-term research will be necessary to fully understand how a disaster transforms ICH.

Post-disaster revitalisation of local rituals, festivals, and performing arts in Northeastern Japan was highlighted and promoted as a means of consolidating the community's cohesion and enhancing the recovery process. When we conducted various research activities during this project, this case was always in mind. Interestingly, however, this seems unique to Japan. As an activity in FY 2018, IRCI has been planning an Asia-Pacific regional workshop on ICH and natural hazards to further examine this issue in the Asia-Pacific context.

Finally, the critical issue is still local awareness and perception of ICH. This is a fundamental part of ICH safeguarding and thus has to be further promoted, regardless of disasters. In such a process, knowledge and practices relating to DRR could be promoted and safeguarded.

REFERENCES

Dekens, J. (2007). *The snake and the river don't run straight: Local knowledge on disaster preparedness in the Eastern Terai of Nepal*. Kathmandu: International Centre for Integrated Mountain Development (ICIMOD).

Government of Fiji (2016). *Fiji post-disaster needs assessment: Tropical Cyclone Winston, February 20, 2016*. Suva: Government of Fiji.

Government of Nepal (2015). *Nepal earthquake 2015 post disaster needs assessment Vol.B: sector reports*. Kathmandu: National Planning Commission.

Government of Samoa (2013). *Samoa post-disaster needs assessment Cyclone Evan 2012*. Apia: Ministry of Finance.

Government of Vanuatu (2015). *Vanuatu post-disaster needs assessment: Tropical Cyclone Pam, March 2015*. Port Vila: Government of Vanuatu.

Mercer, J., Kelman, I., Taranis, L. and Suchet-Pearson, S. (2010). Framework for integrating indigenous and scientific knowledge for disaster risk reduction. *Disaster,* 34(1):214-239.

PreventionWeb (2015). *Disaster Risk Reduction & Disaster Risk Management*. [online] Available at:

https://www.preventionweb.net/risk/drr-drm [Accessed 24 Mar. 2018].
Shaw, R., Sharma, A. and Takeuchi, Y. (2009). *Indigenous knowledge and disaster risk reduction: From practice to policy*. New York: Nova Science Publishers, Inc.
UNESCO (2014). *37 C/4 2014-2021 medium-term strategy*. Paris: UNESCO.
UNESCO (2016). Operational Directives for the Implementation of the Convention for the Safeguarding of the Intangible Cultural Heritage. In: *Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage*, 2016 Edition. Paris: Intangible Cultural Heritage Section, UNESCO, pp.23-75.
UNESCO (n.d.). *What is Local and Indigenous Knowledge?* [online] Local and Indigenous Knowledge Systems. Available at: http://www.unesco.org/new/en/natural-sciences/priority-areas/links/related-information/what-is-local-and-indigenous-knowledge/ [Accessed 24 Mar. 2018].
UNISDR (2009). *2009 UNISDR terminology on disaster risk reduction*. Geneva: United Nations International Strategy for Disaster Reduction (UNISDR).
UNISDR (2015). *Sendai framework for disaster risk reduction 2015-2030*. Geneva: United Nations International Strategy for Disaster Reduction (UNISDR).

RECORDS OF WORKING GROUP SESSIONS

Date: 1 July 2016
Venue: Tokyo National Museum (Tokyo)

Lecturer: Hiromu Shimizu (Professor, Kyoto University)

NATURAL HAZARDS AS THE BIRTH PANGS: THE EMERGENCE OF THE NEW PERSONHOOD AND INDIGENOUS COMMUNITY AFTER THE 1991 MT PINATUBO ERUPTION IN THE PHILIPPINES

Dr Hiromu Shimizu, based on his long-term commitment to the Aeta people in the western Luzon, talked about the transformation of the Aeta self-consciousness and their communities in the past 25 years since the massive eruption of Mt Pinatubo in 1991. Looking into the processes of the breakdown and re-construction of Aeta communities, he demonstrated that a disaster could encourage the emergence of new personhoods and new communities.

The Aeta people used to live in the mountainside of Pinatubo as sifting-cultivators with hunting and gathering as sidelines, and sedentary agriculture has been introduced by an NGO since 1976. Their livelihood, however, was changed drastically by the 1991 eruption of Mt Pinatubo. The catastrophic eruption forced the Aeta people to leave the mountain to live in the resettlement areas, which were built along the foothills and were much closer to

The Aeta people as shifting-cultivators (©Hiromu Shimizu, June 1978)

Overlooking Mt Pinatubo and its foothills that are entirely covered with ash, from Baquilan resettlement area (©Hiromu Shimizu, December 1991)

Prof. Shimizu interviewing his long-term Aeta friend, Mr Victor Villa, about the situations before and after the eruption, and their day-to-day life at the evacuation centre (©Hiromu Shimizu, November 1991)

the towns. Just after the eruption in June, many Aeta people died of diseases such as severe dehydration, flu or measles, due to the poor living conditions in evacuation camps during the rainy season in July and August. While some people eventually returned to their homelands, most of them (80–90% of the affected Aeta population) continued living in resettlement areas. As exemplified in this case, a catastrophe strikes the most vulnerable part of the society, not only once but twice: firstly as a natural disaster that was unavoidable, and secondly in the evacuation camps during the post-disaster process, which was a human-induced disaster and could have been manageable.

As a couple of decades passed after the event, it gradually became possible for us to perceive some major changes in the Aeta societies. The Aeta people used to live self-sufficient lifestyles and rarely went down to towns, where they were disrespected, and were deceived or exploited by lowlanders. Now they actively visit towns by tricycles to sell their agricultural products and negotiate with customers on equal terms. Some of them participate in fiestas in nearby city and town to parade in loincloths, which represent their identity as the indigenous people in the Philippines, even though they usually are dressed in jeans. Among young people who were born in the resettlement areas and received school education, there were a few who went to work even abroad to earn considerable cash income. Some started to get married with non-Aeta individuals beyond ethnic boundaries. As exemplified in these cases, the 1991 eruption significantly transformed the Aeta society. Through this disastrous experience, the Aeta eventually re-established their new personhood with expanded perception of time and space, and their identity as the

Contemporary Aeta youths on motorbike. Two on the left, who are soon to leave for Saudi Arabia as overseas Filipino workers, are on the way to see their parents who have returned to the mountainside. (©Hiromu Shimizu, January 2013)

indigenous people of the Philippines. In a much larger sociopolitical context, the eruption event also led to withdrawal of all the US military bases in the Philippines, which led to the subsequent development in the Philippines of the new national identity as freed and independent Filipinos.

Since Industrial Revolution, societies all over the world experienced various changes from agricultural to industrial societies, from farmers to factory workers, which also transformed the people's perception and the worldviews. However, the Aeta people experienced such changes only within a decade or so, triggered by the eruption of Mt Pinatubo. The cases of post-disaster social transformation are also found outside the Philippines. For example, Tokyo was devastated by the Great Kanto Earthquake in 1923 and subsequently by the Great Tokyo Air Raid in 1945; nonetheless, these tragic events brought about opportunities to create a new 'modern' city of Tokyo and to resume a new lifestyle. In the case of Aceh in Indonesia, the liberation movement had been suppressed and the human rights had been violated by Indonesian National Armed Forces for more than twenty years. However, the peace was restored after the 2004 Indian Ocean Earthquake that caused more than 200,000 death due to tsunami, as international NGOs and disaster relief agencies who entered Aceh exposed such inhumane security enforcement by the National Force.

Viewing culture as a continuous entity corresponding to a certain group of people, particular language, and places is not relevant in the contemporary world. An alternative and more dynamic view is that culture is discontinuous: it could be interrupted, forgotten, or forcefully abandoned. However, a culture is subsequently revived after a period of breakdown, with a creativity incorporating certain new elements.

The disaster strikes people over and over again, and we cannot entirely escape from it. Rather than arguing about the disaster reduction and mitigation, he emphasised the importance of evaluating the recovery process, more specifically the creative recovery and rehabilitation embracing the emergence of new societies. We should recognise the disaster as the birth pangs, through which a new personhood and society could be created, and navigate to consider the process of reconstruction in the longer timeframes such as five- and ten-year terms.

(Summary and captions by IRCI)

Lecturer: Hiromu Shimizu (Professor, Kyoto University)

THE SUCCESSORS OF UNESCO WORLD HERITAGE: LIVELIHOODS AGAINST/FOR GLOBALISATION IN THE RICE TERRACES OF IFUGAO IN THE NORTHERN HIGHLAND OF LUZON, PHILIPPINES

Dr Shimizu also talked about the rice terraces of Ifugao in the northern highland of Luzon in the Philippines, which is designated as a UNESCO World Heritage Site in 1995, and the basic livelihood of the Ifugao people. Ifugao is indigenous people in the northern highland of Luzon whose population is approximately 200,000. Ifugao also means the name of state, ethnic group and language. Ifugao also possesses Hudhud chanting, which was proclaimed in 2001 UNESCO's Masterpieces of the Oral and Intangible Heritage of Humanity, and then incorporated in the Representative List of the Intangible Cultural Heritage of Humanity in 2008.

Rice terraces in the Philippines are constructed on extremely steep slopes. In the past twenty or thirty years, some structures were destroyed by landslides, and water shortage caused by the decline of forests has made the irrigation of rice terraces difficult. Threats and concerns identified when the heritage element was placed in the List of World Heritage in Danger in 2001 are now being conscientiously and systematically addressed through efforts extended by the Provincial Government, as well as the concerned national agencies and NGOs.

Local people have also actively engaged themselves in the protection of rice terraces and reforestation programmes, one of which was the case of Hapao village in Hungduan Municipality. Dr Shimizu reported his research on the local community-led reforestation projects in this village, which started in 1997. While maintaining their rice terraces, almost 10% of the villagers (1,850 people in 380 households, three fourth of the village population is women) work abroad. Remittance by workers overseas enabled the community people to hold splendid funerals, and to redeem their rice terraces that were once sold. At the same time, they are also capable of buying the DVDs of Hollywood movies and TVs. The Ifugao people are enjoying the latest technologies of the world, and yet living a traditional lifestyle at the same time.

The Ifugao livelihood and culture as individual/ethnic identity are deeply rooted in the subsistence agriculture and the landscape centred on rice terraces, which are recognised as being inseparable from natural environment. Globalisation, in this context, has been reinforcing the awareness of their roots and identity. Traditional culture is rediscovered, reconfirmed and reinforced, as a tree stretches its branches while extending and strengthening its roots.

(Summary by IRCI)

Date: 11 November 2016
Venue: Tokyo National Research Institute for Cultural Properties (Tokyo)

Lecturer: Isao Hayashi (Associate Professor, National Museum of Ethnology)

DISASTER CULTURE AND THE TRANSMISSION OF INTANGIBLE CULTURAL HERITAGE

Instead of discussing ICH as a subject matter to be safeguarded/protected from disasters, Dr Isao Hayashi introduced an alternative viewpoint to understand culture and ICH in the context of natural disasters, using 'indigenous knowledge' and 'disaster culture' as key concepts.

There has been three major transitions in the field of disaster risk management in the past twenty years. The first is the change in the hazard protection measures: from the hardware-centred disaster management such as the construction of embankments and earthquake-resistant buildings, to the software-oriented management to reduce vulnerability in consideration of differential social factors such as geographical settings, genders, ages, and educations. Along with this change, a concept of 'resilience', a capacity to restore pre-disaster conditions while accepting the impact, has drawn an international attention. The second is the change in the focus from the post-disaster reaction to the pre-disaster risk reduction. The third is the increased emphasis on the community-based disaster risk management, rather than the government- or specialist-led approach.

Indigenous knowledge was once popular in the field of ecological anthropology in the mid-1970s onwards, although there was not much development after that. Since the beginning of 2000s, however, it regained an attention in the field of disaster risk management, in association with international trends related to the sustainable development emphasising environmental issues. There is no clear, basic definition of indigenous knowledge, but it generally refers to the knowledge which a person or a group of people has acquired empirically. It would be more important to understand how indigenous knowledge has been focused or how it has been evaluated, especially in relation to disaster risk management, rather than discussing the definition itself. However, it should be noted that indigenous knowledge is not in dichotomy with scientific knowledge, and that it is always changing.

A good example of indigenous knowledge that raised the attention in the field of disaster management is the case of *Nandong* in Simeulue island, Aceh province, Indonesia. At the time of the Indian Ocean Tsunami in 2004, almost 70,000 people who were living along the coastal area of the island survived while only seven people lost their lives. People of Simeulue island were able to evacuate safely, because they had inherited the traditional epic of *Nandong* recounting the episode of the massive tsunami that devastated the island in 1907, and the knowledge was properly transmitted as part of their daily lives.

'Disaster culture' signifies the culture (both tangible and intangible) associated with the

Active volcano, Mt. Tavurvur, near the town of Rabaul, in New Britain, Papua New Guinea. National Musk Festivals are held annually in Rabaul or Kokopo by the government of PNG, to support the local economy through tourism. (©Isao Hayashi, 2005)

acquisition, accumulation, transmittion and utilisation of the knowledge concerning the disaster. Disaster culture covers a wide range of elements: technical elements such as earthquake-resistant and/or fire-proof building structures and dams to control floodings, disaster-related traditions and associated perceptions of disaster, disaster awareness, disaster management communities and activities, evacuation behaviors and so on. Especially in the field of disaster management studies, disaster culture is perceived as a concept much wider than indigenous knowledge, including scientific knowledge and the knowledge learned through formal systems like school educations, in addition to indigenous knowledge. Disaster researchers may prefer to call it 'disaster management culture', as it is considered practical and useful for the disaster risk reduction and management. In contrast, cultural studies of disaster in general focus on recording the traditions and experiences of the past disasters and how disasters are percieved.

Indigenous knowledge and the disaster culture both caught the attention of disaster researchers from a viewpoint that the culture could save people's lives and livelihoods from the disaster. For example, in Tsuwano, Shimane prefecture, Japan, a canal system drawing water from Tsuwano River has been placed for the purpose of securing water against fire. In the case of Nohbi Plain covering the southern part of Gihu prefecture and the western part of Aichi prefecture in Japan, *waju* (traditional embankments surrounding the village) has been developed to protect the village from floods. Further efforts are also found in these regions, such as constructing residential houses on top of the raised stone foundation, and placing a *mizuya* on the foundation that is built much higher than the residential house to store valuables and foodstuffs, as well as to evacuate when flooded

Women of Kanbara village (Gunma Prefecture) producing rice dumplings known as *migo-dango* to be distributed to the community people. This is a local tradition commemorating a historic eruption of Mt. Asama volcano in 1783, when villagers received *dango* as disaster relief.
(©Isao Hayashi, 2009)

Kuromori-kagura ritual performance held in 2012, to pray for the deceased (Taro, Miyako-City, Iwate Prefecture). Behind the performers is the coastal levee destroyed by tsunami.
(©Takeshi Abe, 2012)

water comes inside the village.

However, it is important to note that there are other significant aspects and functions in indigenous knowledge and the disaster culture. One is to transmit the experiences of the disaster to the future generations, and the other is to heal people's mind. An example of the transmission is a story of a paddle in Papua New Guinea: a person escaped from a tsunami to the mountain with a paddle on his hand about 14 generations ago, and the story has been inherited among the people until today with the paddle itself. In Ofunato, Iwate prefecture, Japan, a theatrical play based on the memories of deceased parents has been created. Such storytelling activities are common in many places in Japan.

An aspect of culture to heal people's mind is associated with those who lost their lives by a disaster and those who were left behind. While government-led memorial services and ceremonies are carried out, it is hard to accept the death of the closest people. Traditional folk performing arts play an important role in this respect. After the Great East Japan Earthquake, for example, *shishi-odori* ritual dances were performed among the scattered rubbles, and the *Kuromori-kagura* were performed and *kagura-nenbutsu* were chanted to mourn for the dead. These examples suggest that culture has an ability to encourage the recovery of the communities and their livelihoods, while culture itself is also the subject to be revivied after a disaster.

Indigenous knowledge and disaster culture are often narrowly focused in the context of pre-disaster preparedness and post-disaster emergency responses. Howerver, when we look at the relationship between the disaster and culture, we can recognise that culture plays important roles in various places in the process of recovery. Culture's link to the disaster may not be recognised in daily life. However, it is significant to recognise the active roles of culture when a disaster strikes, and during the immediate response and the recovery, and promote the transmission of such culture to the future generations.

(Summary and captions by IRCI)

Date: 30 January 2017
Venue: Tokyo National Museum (Tokyo)

Lecturer: Dr Rajib Shaw (Executive Director, IRDR)

SCIENCE TECHNOLOGY AND DISASTER RISK REDUCTION: THE MISSING LINK

Part 1. Science and Technology Gaps

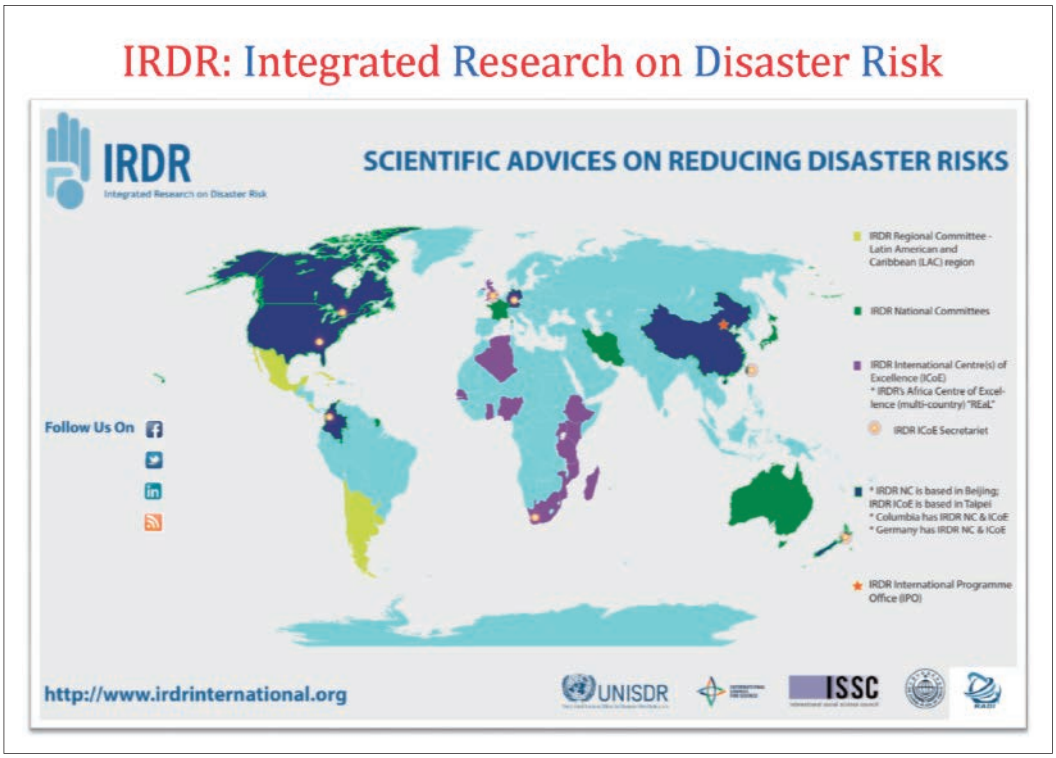
A very good morning to all of you, and my sincere thanks goes to the IRCI for inviting me here. I hope the weather will still be good by the time I end my presentation, so let's see how well behaved we are.

I had a little bit of mixed interest in disaster risk reduction. I started my career as a private consultant at a consulting firm in Tokyo. And then, I worked for the UN for five years before spending 12 years at Kyoto University. Therefore, I have experienced risk reduction from the perspective of the private sector, the United Nations Office, and then the University and then currently, I am leading a research programme, IRDR (Integrated Research on Disaster Risk). I will explain this work a bit later. However, what we usually do is very simple in the field of disaster risk reduction: we don't develop new technologies, but we rather try to see the application of technology through working with people and communities in different countries. We don't try to teach them anything on technology, but instead we seek to learn from them, because there is a huge resource there. We often underestimate the community resources, and that's where, possibly, my main presentation links to the theme of this research programme, which is the intangible cultural heritage. Personally, I am not an expert on cultural heritage. Therefore, my stake in this is more oriented toward disaster risk reduction and my role lies in linking community practices and local knowledge—or what we call 'indigenous knowledge', which is the missing link that I cover in my presentation.

There are two parts to this presentation. The first part concerns the gaps in science, technology and their applications; then, I would like to talk a little bit more on the topic of indigenous knowledge, which has been an area of major interest for me and my research area. Some of my Ph.D. students have conducted research in this particular area for several years, as I will discuss further in the second part of this presentation.

The IRDR Programme has three major components, namely the UNISDR, which is the main body for disaster risk reduction, the International Council of Science (ICSU), and the International Social Science Council (ISSC). These three organisations are essentially the sponsors of this programme, and many of you possibly know that from next year (2018) onward, the International Council of Science and the International Social Science Council will come together and form one unit, which is so important because all too often, disaster risk has been looked at from the natural science perspective.

The ICSU has a very strong natural science component. However, this is possibly the first programme on disaster risk in which natural sciences and the social sciences have come together, which is critically important because no one discipline will be able to solve this problem alone,



and we need this multi-disciplinary linkage. We are hosted by the Chinese Academy of Science, and that's why our office is based in Beijing. However, we actually also have several committees based in other nations. For example, we have a very active national committee in Japan, called *Gakujutsu kaigi*, or the Science Council of Japan, which is directly under the jurisdiction of the Cabinet Office, and the IRDR National Committee is under the Science Council of Japan. Similarly, we have national committees in Australia, Iran, US, Canada and so on. We also have several Centres of Excellence.

The oldest of the thematic Centres of Excellence was established in Taipei. Today, in total, we have around 12 Centres of Excellence, which focus on different types of research on disaster risk reduction. Again, however, one of our key overarching goals is not to develop new research, but rather to provide more science advocacy or science advice for disaster risk reduction. Since I took on this charge last year, we have begun some programmes engaged in developing the National Science Plan in 12 countries. We are working in Bangladesh, in the Philippines, and in Fiji with the University of the South Pacific, and we are working with SOPAC to develop the Regional Science Plan for Disaster Risk Reduction for the Pacific Islands. Today, if possible, I would also like to learn how you look at the element of intangible cultural heritage based on your own experiences.

Many of you are of course aware that 2015 was a very important year that saw the emergence of three major global frameworks: the Sustainable Development Goals (SDG), the Sendai Framework for Disaster Risk Reduction (this was a global framework for disaster that was held in Sendai), and the World Conference for Disaster Reduction. All of these have time frames extending for 15 years from 2015 to 2030. And then of course, we have the Paris Agreement. So, last year, we did some analysis to define the synergy or linkages between these global frameworks.

We wrote a separate paper on that, which is a policy note, the details of which I can share with you if you are interested. It involved simply counting different words, such as 'sustainable development', 'disaster risk' and 'climate change' in these documents. It is interesting that the

Inter-relationship of Global Framework

	SDG (UN 2015b)	SFDRR (UN 2015a)	Paris Agreement (UN 2015c)
Sustainable development		20	16
Disaster risk	12		1
Climate change	20	15	

	SDG	**SFDRR**	**Paris Agreement**
Use of term "LOCAL"	10	48	9
Number of Pages	35	25	32
Context	Authorities, communities, culture, materials and planning (Goal 6, 8, 11 and 13)	Government, community, knowledge, priority, DRR strategy	Communities and knowledge (in terms of Adaptation)

SDG was a 35-page document, the SFDRR was a 25-page document, and the Paris Agreement was a 32-page document, and those terms are mentioned in all these documents. Therefore, there appear to be strong linkages between the SDG and the Sendai Framework, and it is quite clear the issue of disaster risk reduction is very much linked to the development issues. However, while the Paris Agreement concerning climate change was very strongly connected to the issue of sustainable developmentit, it was not that much connected with the disaster risk, which is actually very strange, because in our view, there are also very strong connections between the themes of climate change adaptation and disaster risk reduction. Yet, this linkage is not reflected very much in the Paris Agreement. Another interesting thing is how commonly the word 'local' is used in these documents; you can actually find quite a few mentions of this word, and that's actually very important.

The importance of local action was also clearly recognised in the document that preceded the SDG, which was the Millennium Development Goals and in the earlier document dealing with disaster, which was the Hyogo Framework for Action. However, this term was not used very much in the official documents. What it says is that even at the global level, in these negotiations concerning disaster or sustainable development or climate change, we recognise the importance of local action, and the importance of the local community, culture, material, local knowledge, then local DRR strategy, and local adaptations.

Without focusing on the local issues, it's very difficult to achieve any global target. At least I look at this particular three documents in that way. We have the global targets, and the global framework, but ultimately, the actions happen at the local level, and that's possibly the key reason why we are doing this particular research work to look at the disaster impacts and the relationship between disaster risk reduction and intangible cultural heritage. Therefore, it's really, really a critically important subject that will possibly have numerous connotations in development and disaster risk reduction, as well as in climate change adaptation.

Let me now say a little bit about the evolution of science technology. If we see the evolution of disaster risk reduction, science technology has always been there. Actually, many of you may not be aware that back in 1984, there was a World Conference on Earthquake Engineering; and, at that time, Frank Press, then the US National Science Academy's President, proposed an International Decade of Hazard Reduction, which was brought to the UN General Assembly in 1988 and 1989. It was approved and that's how, in 1990, the first 10-year decade long disaster programme, the International Decade for Natural Disaster Reduction (IDNDR) began in the UN. So, the root was very much located in science technology.

Frank Press mentioned about hazard reduction in his keynote speech at the 8th World Conference on Earthquake Engineering in San Francisco. It is very interesting that back in the 1970s and 1980s, we used to think a great deal about ways to reduce hazards. This, however, has become less relevant now. At that time, the scientists and the technologists used to focus on reducing hazards. However, hazard is something that is natural and very difficult to reduce. Now, we talk about reducing risk. My point is the evolution of the disaster concept has changed from hazard reduction to risk reduction.

Now, we talk more about vulnerability reduction, the root causes in the society. We also talk more on the positive side, in terms of resilience building and how we can enhance resilience. Disaster has been always negative, but there are positive side. Let's look at community strengths, which is where this whole concept of resilience comes from. Over time, in the last 30 years, this concept has evolved quite a bit. However, science and technology's role has been there always.

Very recently, just two years back, after the Sendai Framework in 2015, the UNISDR established the Asia Science Technology and Academia Advisory Group (ASTAG), which began as a small 10-member group. Now we have added two more members to form a 12-member group. I am co-chairing this group with one professor from Beijing in China, and one from Bangladesh, a very famous professor called JRC, Jamilur Reza Choudhury. Everybody in Bangladesh knows of JRC; he is like the godfather of earthquake risk reduction there. I have known him since 1997, which is nearly 20 years now. At the time we met, there was not much awareness about earthquakes in Bangladesh, and he was possibly the only person that was trying to advocate for earthquake risk reduction there. From the Philippines, we have Toni Loyzaga, who was the Executive Director of the Manila Observatory, one of the oldest observatories in the Philippines; now she is the chairperson of the International Board for the Manila Observatory. We have a somewhat diverse group, and our role is again to somehow provide science advocacy at different levels: we advocate for using science in disaster risk reduction at the regional level, at the national level and at the local level also.

After a series of consultations, we have come out with three very specific aspects. One is strengthening science technology in the academic community and making our research more meaningful. Instead of just doing research within the laboratory within the university, how we can try to identify problems in the field and develop customised solutions? Instead of being only interest-driven, how can we develop demand-driven research? The second focus is to support governments in their decision making. We have had a few exercises for that, which is the regional and national mapping of science technology status. I will come back to that later. Lastly, science is not effective unless we collaborate with other stakeholders. It's not just scientists' responsibility, or rather, let me put it in this way; scientists cannot reach the goal unless they collaborate with civil society, the private sector, members of the media and different levels of government. Therefore, how can we create networks linking these different stakeholders? These are the three very specific areas where we are currently working for advancing science and technology in disaster risk reduction.

I listed some bullet points. I won't go into the details of these, but over years of experience and

seeing the various types of the successes and failures of science, I think we have learnt many different issues. We have learnt that we can provide very good technology, but it's of little use if it is not affordable for the local community. I will return to this issue a little bit later. The point is how we can turn a particular technology into an affordable technique that the local community can afford.

Multi-transdisciplinary: No single discipline can solve the problem. I mentioned the need for science to change from being interest-based to demand-based. Yet, there are pros and cons for this idea. People will argue if you always have demand-based research, that's possibly not right because research should be more interest-driven, and that's how you get innovation. However, my argument is we need to have a balanced approach of both: the interest-based research, which brings innovation, but also the demand-based research, which brings application. Both innovation and application are important.

Product and Process: We often talk about different types of technology. While the technology itself is important, the process of developing a particular technology is also very important. And then, finally, research training and action linkage are also quite important.

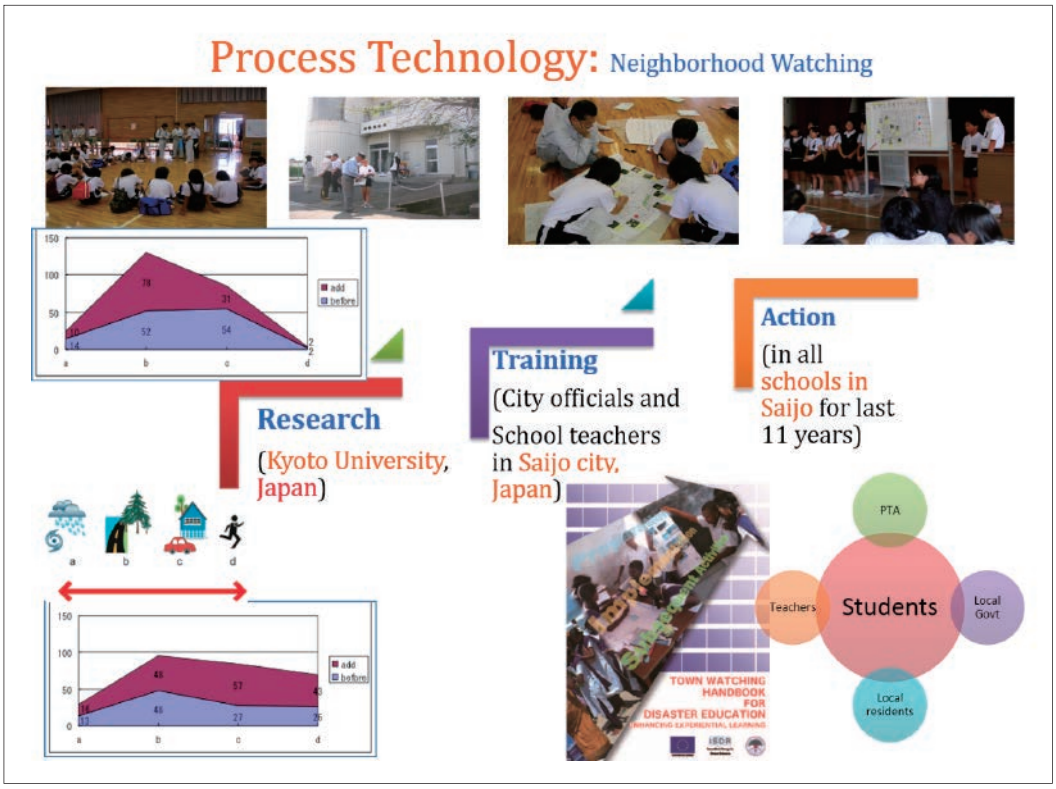
Let me tell you about three different types or categories of technologies that we investigated in a programme at an institute called Earthquake and Disaster Mitigation Research Centre (EDM), to which I was attached through Kyoto University. This was funded by the Ministry of Education in Japan as a 5-year programme under a special coordination fund (*shinkou-chouseihi* in Japanese). In this case, we tried to understand different types of disaster technologies, one of which is called implementation-oriented technology.

For example, we know mangroves play a very important part in reducing the effects of storm surges, cyclones or typhoons, tsunamis and so on along coastal areas. However, the root system of the mangrove differs depending on the species. That's why it is not only the height of the mangrove that matters, but also the width of the mangrove belt, whether it is 50 m, 100 m or 500 m has very strong connotations on how much storm surge it can withstand.

A Japanese institute based in Tsukuba called ICHARM did some pure hydraulic modelling of the relationship between waves and mangrove height and width. In Indonesia, the Coastal Dynamic Research Center tried to customise this model based on the root systems of the mangrove species available in that country. They then provided training on this model to local managers all over Indonesia as a part of the JICA Training Programme. In one city called Padang in Western Sumatra, which had experienced several earthquakes, including a recent one in 2008 or 2009, the inhabitants took up that particular training and started a Community-Based Mangrove Plantation Programme based on the particular width that was prescribed. This is a very classic example of an implementation technology or implementation science, whereby we develop something in the laboratory that is customised based on the local context, and then that result is actually applied in the field in participation with local communities.

I am sure there are plenty of these types of examples in every country. Yet, we often ignore those examples, or possibly do not focus on them or learn from them. Therefore, I am very interested in the second part of what we are doing here today, when I would like to listen to your presentations and try to learn from your own experiences in your respective countries.

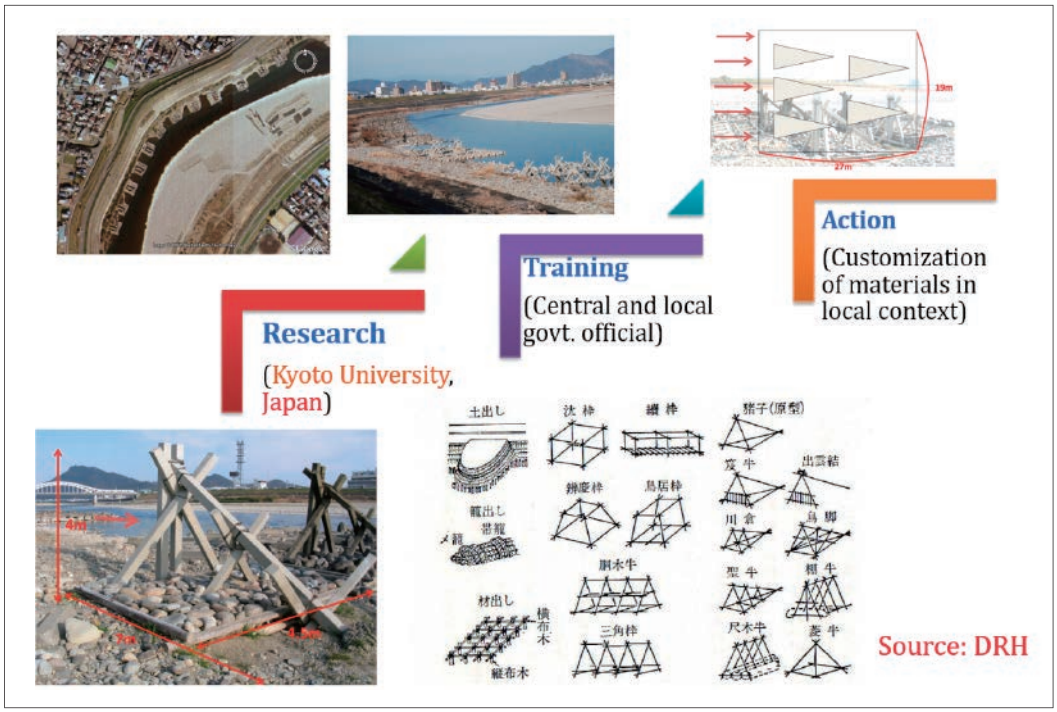
Let me provide another example, which is 'town watching' or 'neighbourhood watching' involving the local community. People think 'oh, that's not the scientists' job; it's a job for the NGO'. This is not academic work, but one thing I did at Kyoto University. With my students, we developed a research methodology to understand the impact of the town watching or neighbourhood watching on the students.



I won't go into all of the details of this project, but we identified four different sets of indicators: one on the hazard; one on the infrastructural impact; one on the impact on the asset; and one on the impact on people. The chart shows the two comparisons that were made: the blue area shows the level of student awareness before the town watching; while the maroon part shows the level after the town watching. You can see after town watching, the students' awareness became very high.

To measure the impact on people is a task for which you actually need to interact with people, and in Japan, we interacted with a group called the *jichikai*, which is the Resident Association and Resident Welfare Association, a local community group much like the *Barangay* or *Barangay* Captain in the Philippines, or the *Upazila* in Bangladesh, which likewise comprises village or local community leaders. In the urban areas, there are many different associations, such as the resident welfare association, so each particular school's 'before and after' was quite different. We developed a methodology, which we applied in training with the city officials and the school teachers in a city called Saijo in Ehime Prefecture, a small city that had been hit by a major typhoon. Now, all of the schools in Saijo have been practising town watching over the last several years. Again, we see an interesting linkage between research, training and action.

The final example concerns indigenous knowledge. I will come back to this issue of transferable indigenous knowledge a little bit later, but for now, many of you know in places where a river that is meandering or bending, it is very prone to erosion. Because there are very strong waves, small blocks are positioned to prevent river bank erosion. There are many different types of structures to protect river bank erosion, which have been evolved over time. In Ibigawa in Central Japan, between Nagoya and Kyoto, these structures were previously mainly made of wood. The wood, however, was very difficult to maintain, so they now utilise concrete structures. Certain measurements were made by hydraulic engineers to see how much force the structures can actually withstand based on width, height and length parameters. This is not a very difficult



technology, but rather something that has been used in many countries, even by villagers.

Similar technologies have been used in Bangladesh, where river bank erosion is a major problem with the famous Bandar River. We had a 3-year project there with JICA, and we saw unbelievable levels of river bank erosion. Here in Japan, the rivers are somewhat shorter and narrower than the Bandar. So, the context is different, but the methodology or the technology is the same. JICA provides this type of training, and we actually personally took several of the participants from among both the central and local government officials to the field area and tried to customise the structures based on the available materials. This customisation is what we call the 'transferrable issue'. I will come back to this issue a little bit later, but the point is these types of technologies.

These are the three examples to make research more meaningful: making research, linking it to training, and then to a very specific action through that training.

A second part of our current activities is national and regional mapping. We have conducted this mapping exercise in 11 countries, but I will describe the example of the work we did in Japan.

After some discussion, we tried to come out with a range of different indicators for three major categories, one of which is science, technology and decision making. Other categories are investment in science and technology, and the link of science technology to people. In total, there are 21 indicators based on a very simple qualitative to semi-quantitative evaluation of the status of that particular country on a scale ranging from 1 (lowest) to 5 (highest). In Japan, we worked with the Science Council of Japan, and a committee on disaster risk reduction approved our rating. We also did this exercise in the Philippines and in Bangladesh, along with several other countries. The table shows the normalised science and technology attribution scores from all 11 countries where we made the analyses.

I need to emphasise this is not a beauty contest I am talking about. But you can see that while China does very well in the areas of decision making and investment in science and technology,

	Attributes of Science and Technology to DRR	Bangladesh	China	India	Indonesia	Iran	Japan	Malaysia	Myanmar	Pakistan	Philippines	Vietnam
1	**Science and Technology in decision making (normalized score out of 100)**	**45**	**90**	**70**	**68**	**63**	**85**	**70**	**48**	**50**	**53**	**53**
1.1	Presence of Science and Technology advisory group to Disaster Risk Reduction (DRR) nodal ministry and/or related ministries	2	5	4	3	2	4	4	2	2	3	2
1.2	Presence of Science and Technology group in DRR national platform	2	5	3	4	3	4	4	2	3	3	1
1.3	Existence of inter-ministerial discussion/dialogue on science related issues	1	4	2	3	2	3	4	3	2	2	2
1.4	Implementation of risk, needs and damage assessment with involvement of Science and Technology group	2	4	4	3	3	5	2	1	2	3	2
1.5	Existence of Early Warning system and mechanism with Science and Technology knowledge and tools	3	5	5	4	4	4	4	4	3	4	3
1.6	Availability of disaster data/statistics on damage and impacts and its data collection mechanism	3	4	3	3	2	4	2	2	3	2	4
1.7	Involvement of Science and Technology group in infrastructure design	3	5	3	3	4	5	4	3	2	1	3
1.8	Scientific revision/ updating of regulations, policies and guideline for DRR including building code, disaster response and preparedness plan etc.	2	4	4	4	5	5	4	2	3	3	4
2	**Investment in Science and Technology (normalized score out of 100)**	**33**	**87**	**53**	**77**	**60**	**73**	**70**	**40**	**47**	**40**	**60**
2.1	Existence of grant support by the national government to researchers in disaster related topics that focus on Science and Technology	1	5	3	5	2	4	4	1	3	3	3
2.2	Establishment of disaster related courses in higher-education	3	5	3	4	5	3	4	2	2	2	2
2.3	Presence of national research institute and organization for disasters	3	5	3	4	4	4	3	2	2	1	4
2.4	Investment/support by the national government in national/international conferences and events on disasters for knowledge sharing	1	5	3	3	3	4	4	3	2	3	4
2.5	Support to collaboration with academia and the private sector for developing innovative technical solutions	1	3	2	3	2	4	3	1	2	1	2
2.6	Support to collaboration with academia and civil society for developing innovative social solutions	1	3	2	4	2	3	3	3	3	2	3
3	**Link of Science and Technology to people (normalized score out of 100)**	**34**	**57**	**57**	**69**	**51**	**69**	**51**	**40**	**40**	**43**	**37**
3.1	Availability of a hazard map to people, developed based on scientific knowledge	1	3	3	2	1	4	2	1	2	3	2
3.2	Scientific validation of indigenous knowledge	1	2	1	2	1	2	1	1	1	1	2
3.3	Involvement of Science and Technology group in developing program for evacuation drills	2	3	2	4	4	4	2	2	2	3	1
3.4	Availability and participation of Science and Technology group in community discussion as facilitator or advisor/commentator	2	1	3	4	3	3	3	2	2	2	3
3.5	Dissemination of science based early warning and forecast to people	3	3	5	5	3	4	3	3	3	3	2
3.6	Involvement of Science and Technology group in developing disaster related education curriculum	2	4	4	4	4	3	4	2	2	2	1
3.7	Existence of facilities such as museum and events such as expo to disseminate disaster knowledge and deepen understanding on disasters among citizens	1	4	2	3	2	4	3	3	2	1	2
Normalized Science Technology Atribution Score (out of 100)		**38**	**78**	**60**	**71**	**58**	**76**	**64**	**43**	**46**	**45**	**50**

when you look at the linking of science and technology to people, the score goes down to 57. Similarly, in many of the other countries, while you will see that decision making and investment are at very high levels, the actual link to the people is very, very low.

Indonesia received the highest normalised score for linking science and technology to people, and there is a reason that. After the Indian Ocean tsunami of 2004, the Disaster Management Act or Disaster Management Law was passed in Indonesia in 2006 or 2007, and it requires that for every local government, even the lowest level of local government has to have one person in charge of disaster risk reduction, and that person must be closely linked to the local community's activity. His/her role in the local community is not just to oversee disaster risk reduction, but also to link with local cultural festivals and other community activities. We need to do a more detailed survey; however, that is my understanding of why Indonesia scored relatively well in the science technology to people part.

Therefore, my main point here is that in this part, there are many different indicators such as hazard maps, the validation of indigenous knowledge, and the dissemination of science-based early warnings and forecasts to the people, among others. There are many important indicators, which needs lots of not just a scientist involvement, but science-people linkage or linkage between science and local community leaders, and that part is still lacking in most of the countries. We need more work on that, and that again highlights the importance of this particular research programme: why we need to focus on intangible cultural heritage, why we need to see the positive sides of the community, the strengths of the community, and how we can properly utilise that. It won't be changed overnight; it takes a great deal of money, investment and infrastructure. This top part will need more time, but through more interactions to identify community strengths, we can possibly work more closely on that.

1st ASTCDRR: Bangkok 2016

Priority 1 Understanding risk	Priority 2 Risk governance	Priority 3 Investment	Priority 4 Preparedness to respond
Action 1 Enhance disaster loss and damage accounting, national and local disaster risk assessment and communication of disaster risk	Action 4 Strengthen science-policy-practice nexus at all levels	Action 7 Make DRR an area of focus within education including networking between universities	Action 10 Promote the role of inter-disciplinary science and technology in effective pre-disaster planning, preparedness, response, rehabilitation, recovery and reconstruction to build back better
Action 2 Use space and disaster risk mapping technologies and strengthen the capacity	Action 5 Develop inter-disciplinary national science and technology plans to support implementation of the Sendai Framework	Action 8 Ensure risk-sensitive investments	Action 11 Develop an efficient and effective cooperation among the science community and business sector by utilizing the advancements of the fast developing information and communication technology (ICT) including big data
Action 3 Strengthen regional exchange on disaster risk information and science	Action 6 Enhance collaboration between local governments, academia and other partners to promote local communities knowledge and traditions and to sustain and replicate many good practices that exist locally for science-based decision making	Action 9 Develop young professionals in the field of multi-disciplinary disaster risk reduction	Action 12 Research into innovative solutions to promote the whole-of-society engagement

In August 2016, we had the first Asia Science Technology Conference in Bangkok, which was organised by the Government of Thailand. The theme of the conference was to determine the key actions for the enhancement of science to address the four priority areas of the Sendai Framework. We discussed 12 very specific actions that needed to be done in Asia for the advancement of science and technology, and one of the very important actions is very much related to this particular research, which is the enhanced collaboration between local governments, academics, and other partners to promote local community knowledge and traditions to sustain and replicate many good local practices for science-based decision making. It's very interesting that these goals supplement my earlier slide very strongly, whereby we saw there is a huge gap in most of the countries, in science's links to the people.

We held a Regional Disaster Forum also at the Asia Ministerial Meeting, which was hosted by the Government of India and held in Delhi in November. The discussions from the science group actually went into the ministerial meeting, and these 12 actions are now officially part of the Ministerial Declaration Annex for the science and technology stakeholders group.

My point of telling this is that we have a strong regional advocacy platform for science and technology, how we can bring science and technology into decision making. And then, the national mapping, which demonstrated the current status that exists for all these 11 countries plus the Pacific. For these countries, we are trying to promote the development of the National Science Technology Plan for the implementation of the Sendai Framework, and for the Pacific, it is the Regional Science Technology Plan. So, this is the current work that we are doing, and my point of telling you all these things is to show the linkage that what the current project is trying to achieve fits very well with the regional priorities in Asia and the Pacific, and the gaps we saw in some of the very specific countries, especially the science-people linkage.

This was Part 1, and let me continue a little bit for Part 2, and then at the end, we will have an interaction session.

Part 2. Local and Indigenous Knowledge and Disaster Risk Reduction

Part 2 deals with the topic of local and indigenous knowledge in more detail. This is the work that we have been doing from about 2007 onwards. We published a book on this issue called *Indigenous Knowledge and Disaster Risk Reduction*, as well as a policy document with UNISDR called *Indigenous Knowledge for Disaster Risk Reduction,* which is a compilation of best practices, and this one is a policy note (*Indigenous Knowledge: Disaster Risk Reduction Policy Note*).

We have conferred on this very interesting concept of indigenous knowledge, asking what is indigenous knowledge, and how do we approach it? We had several gatherings and workshops, and we came up with this idea of 'nutrition guide versus cookbook or recipe'. Nutrition guide is something that tells you at which age you need a certain type of nutrition and how much nutrition you need, especially when you talk about the child's growth. However, from which ingredients the nutrition comes, how you take that nutrition through which food; whether it is a Filipino dish or a Pacific or Fijian dish or a Bangladeshi fish curry or a steak in Australia? It all depends on the local context, and this is an underlying principle of transferable indigenous knowledge.

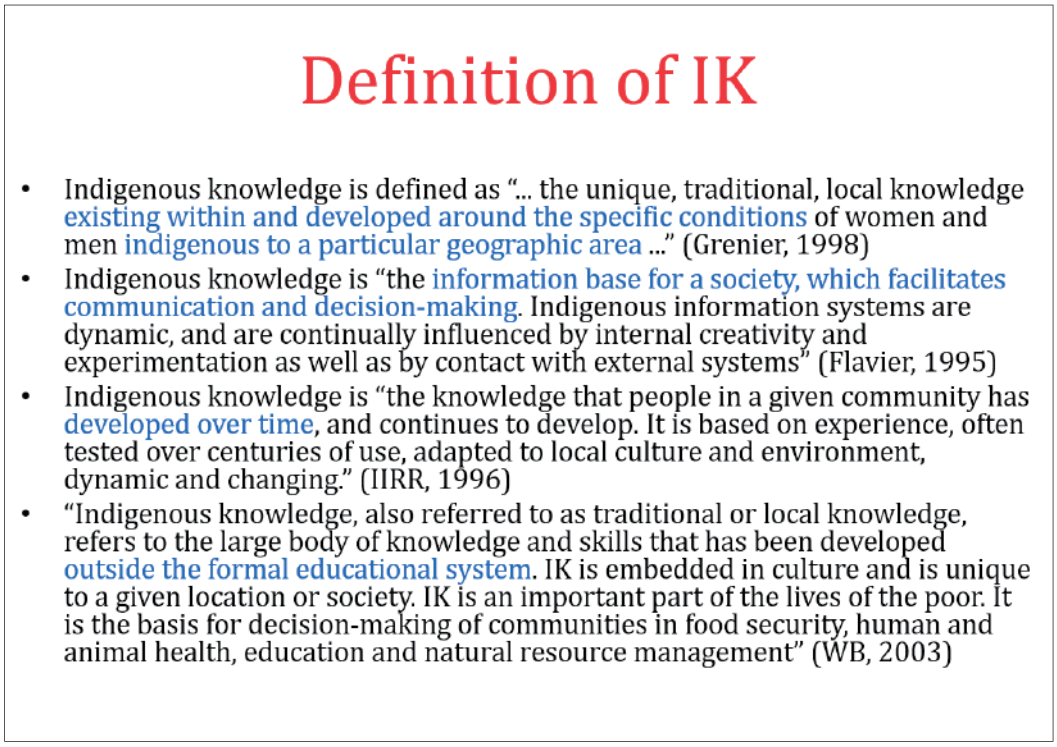
Therefore, what we are talking about here is something on the level of a nutritional guide that defines the basic principles behind different types of local knowledge. However, in determining how the knowledge is practised in different contexts, even in one country, there are many different connotations based on the locational issueand the local hazards. In the Philippines, what applies in the north versus what applies in Mindanao — will be totally different based on the local climatic conditions. These are possibly the cookbooks or recipes that already exist at the local level. So our possible target is to look at those recipes, try to analyse them and try to find some commonalities. They are very case-specific, but there are some commonalities possibly, the basic principles that can be shared widely with other regions or countries.

Time-space sharing is very important, especially with the next generation, and we need to understand that our lifestyle is changing. We are entering into a different age: the information age. Information technology — which did not even exist 50 or 100 years back — has become very relevant these days. Now, even in the most remote parts of most countries, everybody has a mobile phone. Therefore, nobody looks for the normal landline anymore. There are many different new technologies emerging. How, therefore, can we link traditional, local knowledge with the advancements of technology, and bring it to the next generation? I think that's a very important issue. Therefore, we need to look at the cookbook to understand the local recipes and try to filter up certain basic principles to bring them into the nutritional guide. This is my understanding of the indigenous knowledge. I might be totally wrong. However, for the last 50-plus years, if you see, these have been very relevant for the disaster risk reduction, in that there has been a very strong emphasis on the modern technology in disaster risk reduction.

We have been focusing on issues such as early warning systems and risk assessments, in many countries. We have been focusing on strengthening the buildings and the earthquake technologies, and so on. There has been a great deal of emphasis on modern technology, which is very good. However, then, we found that modern technology has applied only 0.1%, or depending on the country, possibly 0.01% of the building stock available. Therefore, there remains 99+% of building stock that needs different types of input.

In the case of an earthquake, there are many ways of retrofitting mud buildings or retrofitting stone constructions, and the principles will be different for a concrete building. Our basic principle of retrofitting is the building should not collapse because it is a big investment. There can be cracks but the building should not collapse. You know, however, you cannot really protect a mud building or a stone building because it will collapse anyway. You can't use a steel band to reinforce the mud building. So, the building will collapse, but how we can have some time so that people can get out, so that there are no casualties when the building collapses? So the principles are totally different. When we retrofit the traditional mud or stone construction, we try to make different types of bands, joining these two walls together (the walls are sometimes very thick) to make a proper linkage between the outer wall and inner wall.

Again, affordability is a very important issue. You can make a very good design and some very good models based on your experiment at the university, but whether the people who are living there can afford it. With many different statistical data, we came to the conclusion that if the retrofitting cost is more than 7% of the construction cost, then it is not affordable for the lower middle income group or the lower income group. Therefore, the cost has to be below 7%. But of course, as you reduce the amount of the investment, the safety level is also reduced. It's a balance between cost and safety. What are the critical positions where we need the proper safety issues or safety elements? This is where refocusing on indigenous knowledge becomes very important, because we need to really understand the dynamics of each particular local material and the local building technology. That's what we have really tried to focus on from the 1980s onward. Some hard-core civil engineers or earthquake engineers, such as in Japan at my Kyoto University have thought that only earthquake engineering can solve the problem, but all their strength or pride was devastated by the 1995 Kobe earthquake, when we saw a major problem, in spite of all the different technologies. The major casualties were associated with old wooden houses and buildings, in which fire incidences were a major issue, and most of those who died were elderly people. This is more of a social issue, rather than only a matter of earthquake engineering. And that's how, again, the disciplinary linkage focusing on the indigenous knowledge becomes very important.



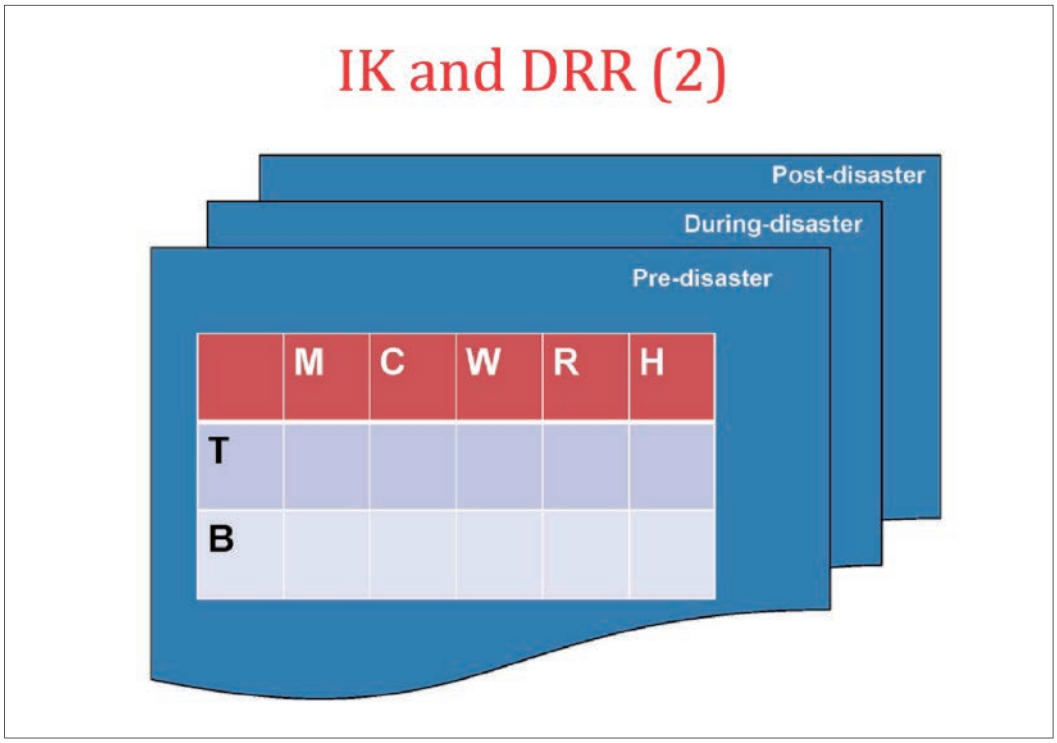
The science agenda of 1999 emphasises the cooperation between the holders of traditional knowledge and scientists to explore the relationship between different knowledge systems, which is very important. I do not underestimate the importance of modern technology, but the interaction of these two types of knowledge can be a very good collaboration.

There are many different definitions of indigenous knowledge. UNESCO has been the pioneer in bringing this indigenous knowledge issue to the global platform through different types of global agendas. And now, whether it is the World Bank, UNESCO or some other institution, they see indigenous knowledge in different aspects. I've just put a few definitions here, from the World Bank, the IIRR and a few others. I won't go into the details but I think that we can define a few thing. Of course it's indigenous to a specific area and community, which relates again to the idea of local recipes, and it's very, very local. It's very much within that particular community; it is very culture and context-specific. It is non-formal knowledge, and it is mostly orally transmitted over generations. There is a very strong time issue that indigenous knowledge was developed by the people there, and it has changed over time through the trial-error method. If it is related to disasters, different types of disaster issues bring new findings; something failed, so how we learn from the disaster, and then bringing back? There are many different ways of looking at these issues, survival and subsistence, and there are dynamic evolution.

In our book on the indigenous knowledge, we tried to categorize it. There are many different ways of categorising indigenous knowledge and disaster risk reduction (DRR). Especially for indigenous knowledge in DRR, we tried to look at indigenous knowledge in river basin system, mountain regions, plains regions and coastal regions. For example, as I have mentioned, the common building technology in the mountain regions is stone construction; stone masonry is very common in most of the areas because of the availability of the local material. Nowadays, building in stone has become much more costly. In the past, people would use larger stones, but now, bigger stones have become very difficult to obtain, which makes them more costly. There were very specialised masons who used to do that type of bigger stone construction. But they are not available now, so people use the rubble, or very small stones, and this transition from stone masonry to rubble masonry has made constructions very weak and vulnerable to earthquakes. There are many different stones here with a wall thickness of around 50 cm to 60 cm. Because of the weather conditions, most of the stone constructions in the mountain regions used to have very thick walls to protect people from both cold and hot weather. The technology that existed for the earlier larger stone masonry is no longer valid for this rubble masonry, but there are certain basic principles that remain valid, like how to stitch these two walls together.

In the river basins in Bangladesh, especially along the major rivers, there are *chars,* which are formed by the sediments carried and deposited by the rivers. When those islands have been stable for over four to five years, people start living there. So they are virtually living within a river. But there are benefits to this in that the soils are very fertile, so they can have very good agriculture, and they can have lots of fish. It is good for their livelihood, but every year for about two months, they have to face the flooding water, which rises very slowly and also recedes very slowly. So the upliftment of the buildings in the *char* area is very common. We have similar thing in Japan, which is well-known *mizuya* raised houses that are built on foundations that are about 80 cm or 1 m higher. In the old days, the whole neighbourhood used to come to have a shelter in this type of *mizuya*. Similarly, in Thailand, people living along the Chao Phraya River are using a type of stilt to make their buildings a little bit higher. So there are many different types of technologies in the floodplain areas. Concerning the coastal areas, I already talked about the role of the mangroves and so on.

We have classified indigenous knowledge like this (M for 'mountain', C for 'coastal', W for 'water', R for 'river', and H for 'housing'). There are many different ways of defining the technology, and we tried to see this as a hard-core technology. But also we need to understand that there is the



belief system, which may not be reflected physically, but possibly exists in the local community, and there are certain scientific validations. When we were working in the southern part of Viet Nam, local people told that if the dragonflies fly high, then there will be rain in the next day, but if they fly low, then there will be longer period of drought. I am sure that in Africa, there are also many different types of well-documented indigenous knowledge such as if a certain type of bird puts its nest on the higher part of a tree, then there will be rain, but if it is built closer to the ground, then there will likely be drought. So there are these belief systems, which possibly have some correlation with a certain level of technical and scientific validation.

However, there are also belief systems that are just linked to the local religion, cultural practices and so on, which may not be scientifically validated every time, but that's how people believe. How we try to understand that, and how we try to look at the positive side of it and utilising it in DRR will be very important, and this is very relevant to your current project about intangible cultural heritage.

We also tried to categorise this as pre-disaster, during disaster and post-disaster. For example, the Moken communities, sea gypsies in Southern Thailand, have been told that, if you look the water recedes, instantly move to higher ground as a big wave may come later. That's how it happened for the 2004 Indian Ocean tsunami, and how it is transmitted is through the folk songs in the local community in the local language. Nobody documented this one; the old people just sing it to the next generation, and that's how it is all transmitted. Some of the indigenous knowledge or belief systems have scientific validation and some of them do not. So we tried to somehow categorise them. When you talk about intangible cultural heritage, a certain level of categorisation will be very important. Try to see that there are many different ways of categorisation, and depending on your identification of the types of intangible cultural heritage, you can possibly have your own type of categorisation.

Transferable indigenous knowledge is a traditional art of disaster reduction that is indigenous to a specific region, have a time-tested reliability, but also has the potential to be applied to other

regions. Again, going back to the cookbook or the nutritional guide analogy: the knowledge has been tested in one place, but it can also be applied to other areas. To understand the transferability, we need to understand what to transfer, who transfer it to whom, and how to transfer. I will give you a few examples to see how we can understand such indigenous knowledge, and how we can look at the transferability issue.

This is an example from Gujarat in the western part of India. In 2001, there was a major earthquake in this particular area, and almost 14,000 people lost their lives. In this area, the highest temperature I have experienced in the field was 49 degrees, and it's so difficult to stand outside in the sun for 10 minutes. I remember I had a Japanese colleague who was taking a video while we were talking to the community, and the video became so hot as if it would melt. So it's a very high, very strong heat in the peak of summer. In the winter, the temperature can be as low as around 2 or 3 degrees at night. There is a variation of around 40-plus degrees from winter to summer, and to withstand that variation, the people use very thick walls and thick roofs. Both of them are equally dangerous in the earthquake, and major casualties have occurred when a whole building collapsed and the people could not get out. As I mentioned earlier, the basic principle of stone masonry or rubble masonry is how the buildings can withstand the shaking a little bit longer, so that people can evacuate.

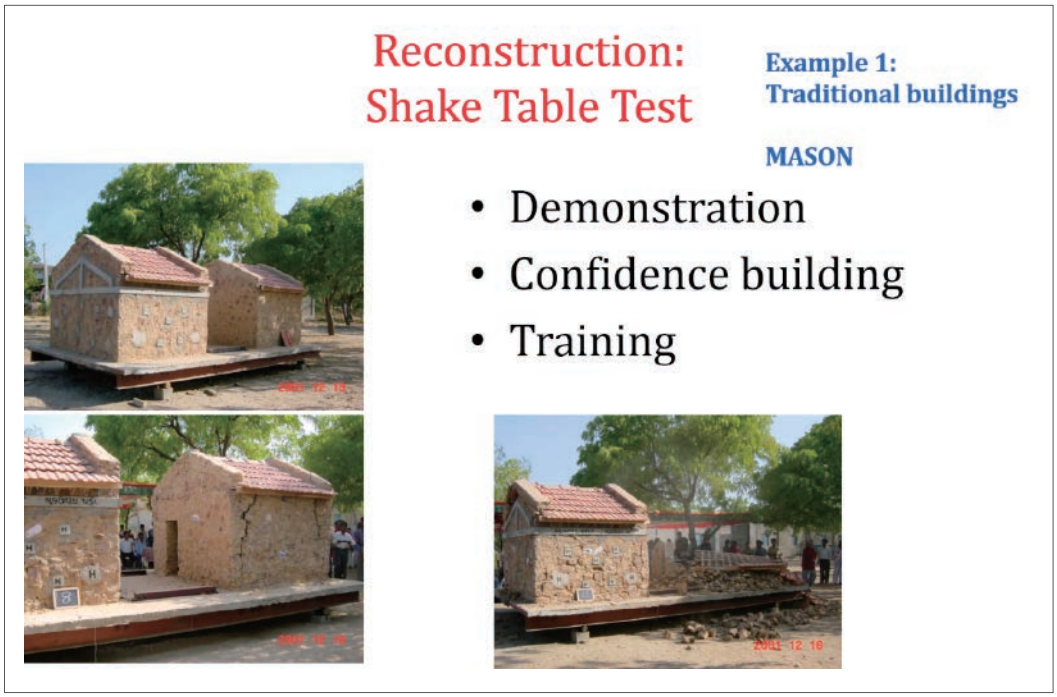
Because these are very simple structures, just one-storey buildings, and there is open ground in front of the inner courtyards of most of the houses, you are safe once you get out. But the building should not collapse instantly; it should shake a little bit before collapsing. That is a very basic principle. We had certain discussion initially with the local communities and the local masons who actually do this type of building. These local masons are all trained by their parents, so the whole technology is handed over from generation to generation. Then we found this type of belt to reinforce the wall. As I mentioned earlier, a single stone is now very expensive, so people put rubble in between only a few large stones. A few larger stones, or the 'true' stones, is very important, so these two points came out very strongly in our discussions with the local masons. They told us they knew the technology, but asked how they could use it in an affordable way.

So with our colleagues in India and Japan, we thought that we should have some acceptable demonstration to show the importance of this principle, because the common people would say, 'No, no, no, this building will collapse. If we had concrete buildings, it would have been better, so in the reconstruction, we need concrete buildings'. This is totally wrong because concrete buildings cannot withstand midsummer temperatures of 48 to 49 degrees Celsius.

So we made this half-sized model building with certain technological interventions, and then we had a seismograph brought there. We had a tractor actually hit the building to demonstrate how much of shock it absorbed. This was very easy to understand. We used to tell them, 'okay, this is about 70%; you have felt particular shaking; so think about that shaking is continuing longer time or less time', and something like this, to add a certain level of interpretation.

We had the top-level policy maker, then the researchers from Japan, the house owners and the local masons, and interactions with them were very important. My point is that the technology exists, which needs a little bit of refinement to have that particular principles that it should not kill people, it should give a little more time before collapsing. But to build confidence in the local community, we need to have different types of change agents. One of the best change agents were the local masons to whom we gave training, and through them disseminate this technology to the outside.

Another example is the town watching programme in the school in Saijo, Japan. In 2004, a major typhoon hit this small city of around 10,000 people. It has mountains, plains and coastal areas

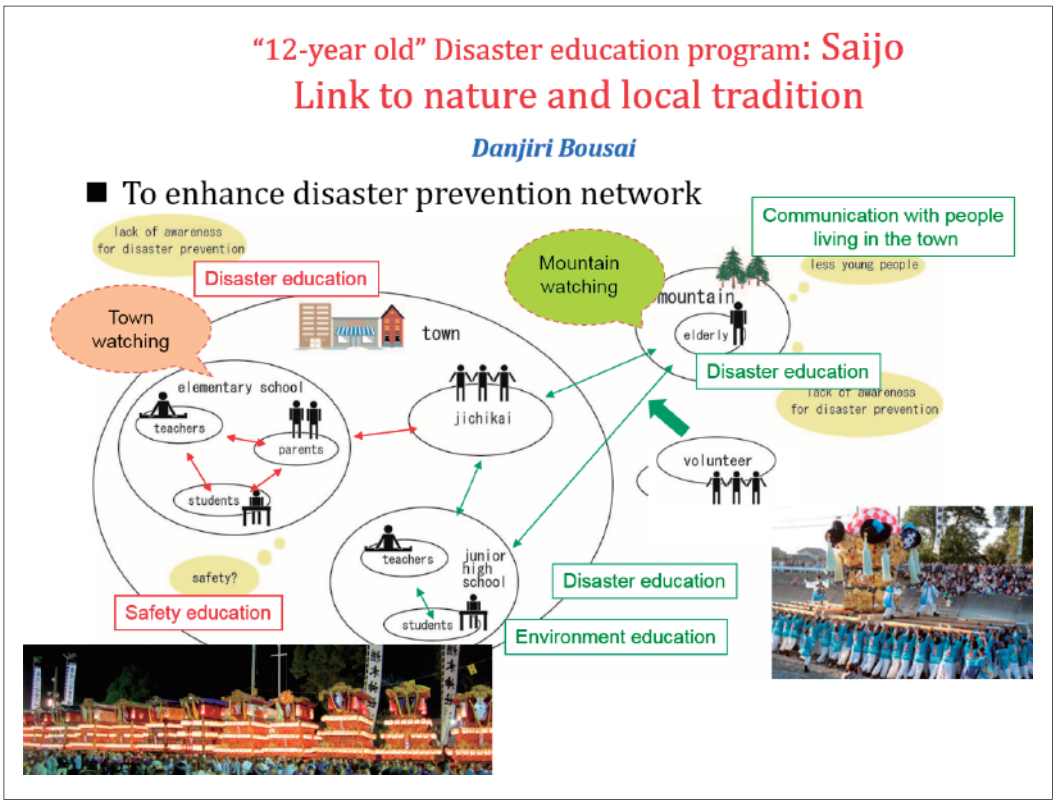


and there were two days of continuous rainfall that caused lots of landslides and inundations, so, there was quite a bit of damage. What we did there is, we tried to do this town watching and the mountain watching. Some of the students will look at the mountains, and try to identify the key issues there.

Deforestation is a major problem in Japan. In developing countries, we cut trees; in Japan, not cutting trees is a problem because ultimately, trees are living objects. All these trees were planted after World War II in a National Plantation Program, and the trees were planted very closely together, which was fine when the trees were small, but then they become very tall and heavy, so there is no percolation of sunlight inside the forest. Many of the community members told me that you actually need a torchlight to enter into the forest even in the daytime because it is so dark. This has a very strong impact on the soil conditions, because the trees will bend in strong winds, and the whole soil is washed when there is a heavy rain. This is a major issue, so these volunteers actually does lots of work on the forest-related activities.

The *jichikai*, which is the local resident association or community group, gave lots of advice to the teachers, parents and students, so it was a collective watching. We did this several times, and then we had *'danjiri-bousai'*, which is a very strange word in Japanese. A *danjiri* is a festival, using some sort of small chariot owned by each community. People really value it, and the Mayor of the city explained that people might be reluctant to give monthly fees of 500 yen for the *jichikaihi*, but for this *danjiri*, they will donate 50,000 yen or even 100,000 yen without a problem; it's a pride for them. Every year, for three days of October 15–17, they bring in all these *danjiri* from different communities to hold a festival. The whole city is closed, and you will see people at the festival drinking. People drink the whole night and enjoy themselves. I personally went there several times, and then I decided better stay away. It's a very lively festival, and the community bonding is extremely important.

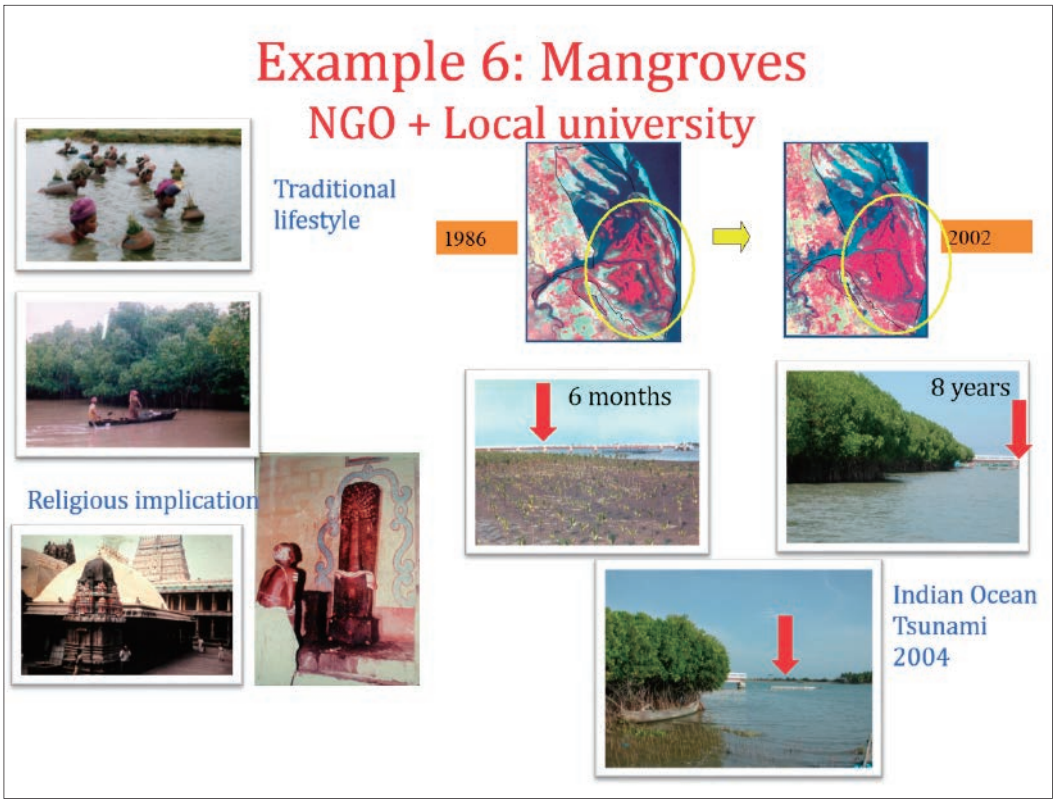
So, the mayor came up with the idea that we should have the DRR concept somehow injected in this type of festival, and so he started this *danjiri-bousai*. The children who did this town watching and mountain watching gave presentations in front of this *danjiri* of course, during the daytime, while people were still awake. In the evening, you can't make any presentation as half of the people are drunk. But in the daytime, when people are still fresh or maybe a little bit of



hangover, then they listen to the students and performance, drama and other activities. The point here is that this *danjiri* is a very local festival, which has been rooted in communities for centuries, and people really value this community festival. This is how we injected different types of risk reduction measures by utilizing this local festival.

2004 was the year of the disaster, and I went there for the three years of 2005, 2006 and 2007. The interesting thing is that now I don't do anything and I hardly go to the city anymore, but the disaster festival there has continued over the last 10 years. My point of presenting this example is that if we can really understand the local festival or local culture or local tradition as intangible cultural heritage, then that will be our real entry point for disaster risk reduction. Every city, every location, every community has its own way of doing things.

Here is another example of indigenous knowledge and information communication technology (ICT) that we implemented in the southern part of India to provide a warning system to the fishermen. These fishermen have been in the area for generations. They are very sensitive to the temperature of the sea. Before a typhoon, they understand that the top part of the sea wave becomes a little warmer, and that the warm wave or that particular layer, maybe 30 to 40 cm of that water, brings a very specific type of fish. They have been doing this for a long time, but the negative part is that to catch that fish, they actually enter further into the sea near the cyclone area. So the challenge was that we couldn't stop them from fishing there, because that was their livelihood and they need to do it. Then how can we link them to a proper warning system up to where they can go, and when they should return?



This was done through one company called BREW application, along with a few research institutes and universities. They measured the sea temperature and the cyclonic pressure and created a simulation. Now, even the fishermen have smartphones, and there is a smartphone application that actually helps them determine the optimal time to go back. I don't say that this solves each and every problem. You know people, we are all greedy, so we go, catching more fish and going further. There are still some casualties, but I think the casualties have been lowered quite a bit. This is another example of scientific knowledge and the local belief system. By trying to link it with the modern technology, at least we can change and save people's lives.

Another example from Japan is a very traditional water governance scheme in a well-known area called Gujo Hachiman, which is a UNESCO Heritage Site. This whole city was actually burnt down in a major fire 400 years back. The city was rebuilt with all wooden buildings, and there are many different types of water structures in the city. There is a small river there, and there are also some middle sized canals filled with water. In front of every house there is a water canal, and there is a wooden board. You can put that board to accumulate the water for you to use. There is also a point structure where you can use different types of water; these are step-wise water points, the top one is for the drinking water, this one is for washing the vegetables or other food, this is for washing the utensils and tableware, and this is for other uses.

What is very interesting about these water systems is nowhere is it written that this water is for this particular purpose. This is a very traditional water governance system that has existed in the local community over many years. We tried to document and sketch it, but nowhere in the city is it written in that way. Rather, it is rooted in the people's beliefs and their behaviour, and we got to understand it by observing it and interviewing some of the people. We did some research on the water governance and tried to see how the people and the water link have been in place over the years, how it has evolved over time, and how different types of governance systems actually affect the water usage. This is a very traditional way of looking at local communities'

behaviour; but it has a very strong governance structure.

I talked about mangroves in an earlier example. This is another example about mangroves in the southern part of India. This is a remote sensing image of the Pichavaram mangrove in the state of Tamil Nadu, which was hit by a tsunami in 2004. From 1986 to 2002, there were some plantation exercises. There are many villages where people do lots of traditional fishing; they do hand picking from the mud and spend about seven to eight hours of a day in this water. There are also different types of non-timber products from the mangrove, which has some religious implications. This is a very famous South Indian temple where the mangrove is depicted in a painting and people actually worship it. There is a very strong cultural and religious attachment to the mangrove, but it is also related to their lifestyle.

A local NGO and a local university started this mangrove plantation project. The slide shows the progress of the project after six months and eight years. The bridge there broke down during the 2004 tsunami. However, the people who were living on the other side of this mangrove forest were all protected. I remember a professor at this local university, whom I respect a great deal, told me that when he visited this particular village two to three days after the tsunami, many people came to him. In the Indian tradition, they touch people's feet, just to have blessings, so the people touched his feet and told him 'You saved our lives. At the beginning, we didn't understand, but we worked with you for the last eight years planting these mangroves, and that's how we were protected.' Then, the professor told me 'I got my Nobel Prize. I don't need any other Nobel Prize because my main target was to bring science or to give a benefit of science to people', and this is a classic example.

So there are local traditions and local cultures. But possibly, we need some sort of external trigger. In this case, the trigger was this local university and the local NGO, who worked with the local community to bring all these traditional values together. Again, it's a classic example of having a very strong local cultural asset that has been transferred to a biological asset and that actually saved people's lives. There are many, many other examples of this intangible heritage.

One important thing in intangible heritage is how we can make it tangible in different forms. Tangible doesn't necessarily mean we have to build something, but tangible in policy, tangible in practice, tangible in the belief system, or tangible in the education; there are so many different ways of making this intangible cultural heritage tangible. These are my reflections that ICH or the indigenous knowledge is rooted in local systems, governance, values, cultures, food habits, festivals, and so on. It's very important to recognise that ICH or indigenous knowledge plays an important role before, during, and after disasters to reduce the disaster impact, and there is plenty of evidence for this.

So, it would be good to look at this issue in a more systematic way how it has reduced different types of impact. Depending on the nature of the hazard — be it an earthquake, a volcano, a tsunami or some climate-related disaster like a typhoon, a cyclone, a flood or a drought, the approaches are different. It often goes unnoticed, and not reflected in local or national government priorities. That's why I would say that making intangible cultural heritage tangible is very important.

How we can notice it? How we can reflect it? How we can make it into the local and national governments? I think that's very important, and that's my expectation for Nojima-san and the team — that during these three years of experience on this particular project, you will at least make certain changes, at least to link ICH to the local government or certain level of national policy priorities, through policy advocacy, documenting, analysing and validating. It is very important, and this first year is possibly to try to understand these issues from different places and perspectives.

Specific change agents or advocates are also required. In the example I gave from Gujarat, it was a mason, and in Saijo in Japan, we had the school teachers, the local volunteers, the *jichikai* or the local resident association leader, and the *danjiri matsuri*, which is a festival where the role of these local leaders became very important. For the fishermen case in southern India, the local ICT company was very important. And for the last mangrove example, it was the NGO and the university who became the change agents. Different cities and contexts will involve different types of change agents. So we need to recognise that and try to work with them for the sake of advocacy.

I think that's all from me, and I am looking forward very much to listening to your questions, comments and suggestions. Thank you.

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Brief Discussion Concerning the Lecture

A few questions and comments followed the lecture, while some of the issues relating to indigenous knowledge were kept aside for the final discussion.

Confirming the importance of indigenous knowledge by sharing his own experience of Bangladesh, where the mangrove forests saved the people from storm surges during the Cyclone Sidr in 2007, Mr Mahmood (UNESCO Office in Dhaka) questioned how the younger generations, who are largely dependent on different types of technology, could adopt indigenous knowledge.

Dr Shaw responded that the issue of transferability beyond the timeframe and the generations becomes very important because each generation has a different orientation to their dependency on different types of technology. As an example, he introduced his work in Kyoto, which was to develop an information and communications technology (ICT) application that enables people to access a community hazard map that the local communities are working on and to write different types of comments. He noted that many young students from outside the community have made significant comments, which were subsequently brought to the notice of the local community. To solve issues related to the intergenerational transmission of indigenous knowledge, certain types of interfaces, mechanisms, or change agents should be included, which may vary depending on the location.

With reference to *danjiri-bousai* that was cited as a case of a pre-emptive DRM programme by Dr Shaw, Mr Ishimura (Tokyo National Institute for Cultural Properties) added the importance of community festivals for the community's cohesion and resilience during post-disaster situations, and introduced their research and documentation of coastal communities in the Tohoku region after the Great East Japan Earthquake and Tsunami.

Dr Shaw explained how he had also been involved in the recovery process in some cities in Tohoku through his NGO (SEEDS Asia), where the disaster was utilised to revitalise traditional songs and dances that had gradually declined since 30 or 40 years, and expressed his interest in learning more about the findings related to the role of ICH during the post-disaster recovery process.

Mr Iwamoto (IRCI) followed that festivals bring local people together as well as encourage people who had left the community to return for help. They also unite the older and younger generations, all these factors being crucial for the sustainable development of the community.

ICH SAFEGUARDING AND DISASTER RISK MANAGEMENT IN BANGLADESH

Rahmatullah Al Mahmud Selim[1]

Welcome everybody and greetings from Bangladesh. Bangladesh is a repository of intangible cultural heritage for centuries and at the same time, Bangladesh is one of the most disaster-prone countries of the world. From the ancient time, Bangladesh was individual villages isolated and self-sufficient. They had their own production system, own culture and own entertainment system. So, they developed different types of intangible cultural heritage and different types of ballads, different types of songs, different types of stories, etc. Due to that, as a whole Bangladesh has inherited a lot of varieties of intangible culture heritage. Of course, most of them have disappeared now.

Bangladesh every year faces natural disasters and some other disasters. There are two types of disasters in Bangladesh, one is natural disasters and another is human-created disasters. Natural disasters: you know one is a storm, cyclone or tidal bore; the second is the flood; third is the erosion of river banks; fourth the tornado; fifth the earthquake; then tsunami and drought.

Cyclone: Bangladesh every year faces cyclones. The biggest cyclone was on 12 November 1970 when Bangladesh was under the rule of Pakistan. The loss of life was 300,000 and the financial loss was not available because at that time it was pre-independence time and the government of Pakistan didn't look at us and they didn't do any calculation. On 29 April 1991, the loss of life was 138,882 and the financial loss was 60 billion BDT (Bangladeshi Taka). On 15 November 2007, it was named as Sidr, and the loss of life was lessened to 3,363 but financial loss was 134 billion BDT. When you see the four pictures after the devastation, the houses have been devastated and on the right side two dead bodies are being collected from the paddy fields. And then lower left, near Sundarbans many beasts, deers etc., died and on the right side, people are trying to recover their losses.

Flood: Flood also happens almost every year in Bangladesh. Bangladesh experiences floods to different degrees and the most disastrous floods are in 1987, and 38% of the land of Bangladesh was inundated. Death tolls 1657, crops lost 1.5 million tons, and financial loss was 35 billion BDT. And in 1988, 60% inundated, 2379 people died, 3.2 million tons of crops lost and BDT 40 billion was the financial loss. In 1998, 75% of Bangladesh was inundated but life loss was 1050, crops lost 4.5 million tons and financial loss was BDT 142 billion.

River bank erosion: I have not given any chart but according to World Disaster Report 2001, published by IFRCS (International Federation of Red Cross and Red Crescent Societies), about 1 million people are affected every year by river erosion and 9,000 ha of cultivable lands vanished in the river. Most of the affected people become homeless, for an uncertain period. This is the hazard for ICH properties because many people are *baul* singers, or folk singers. They lost their places and they have to work in the towns by pulling rickshaw and/or anything else.

Earthquake: Earthquake is a disaster, of course, and the first recorded earthquake in India is 1548. I think Dr Rajib Shaw would know any further previous record is there. No Richter Scale

1 Gaanbangla Television, Bangladesh

Major Natural Disasters & it's Effects: Cyclones

Date	Loss of Human life	Financial loss
12th November 1970	300,000	Not available
29th April 1991	138,882	BDT 60 Billion
15th November 2007 (Sidr)	3,363	BDT 134 Billion

available in 1548 and at that time earth opened in many places in Bangladesh and threw up water and marks of sulfurous smell, it was a big earthquake but it was not measured. In 1762, still no Richter Scale available, permanent submerges of 155 km^2 of land in the sea near Chittagong and 500 people lost their lives. In 1885 it was measured magnitude 7; 1895 magnitude 8.7; 2009 Bay of Bengal Earthquake, magnitude 7.5; and 2011 magnitude 6.8, epicenter 500 km north from Dhaka. If you see the map, the map is divided by colors, the darkest color is the highest risk region. From the northeast regions to the southwest, the risk is gradually lower for the earthquake in Bangladesh. But it is told that if any big earthquake happens in Bangladesh, most of the high-rise buildings of Dhaka will crack down and collapse because of its unplanned development and unplanned constructions.

Human-created disasters are famine, riot, war, political unrest and others.

Famine: The most devastated famine is the Great Bengal Famine from 1769 to 1773, 10 million people died. It was when the British rule started and due to their wrong policy 10 million people died. The next greatest famine is the Bengal Famine from 1943 to 1944, 3 million people died as British rulers hoarded foodstuff. Japan was attacking from the eastside, so they thought that Japan would be more powerful if they get the food, and due to that they hoarded all the food from the market and people died mercilessly.

Riot: In 1946 the Indian riot, actually told the Calcutta riot caused deaths of thousands of people and accelerated the division of India for which billions of people had to migrate leaving their place of birth. Many ICH properties have been disappeared from Bangladesh. It is to be cited that many ICH properties have disappeared from Bangladesh due to the migration of Sanatani population, Sanatani means Hindu people from Bangladesh. You know India was divided on the basis of religion, Muslim's land will be Pakistan and Hindu's land will be India. It was nasty politics called 'Divide and Rule', so it was divided and from East Pakistan, Hindu people had to migrate to India. Most cultural activities and cultural properties were held by Hindu people because they religiously do that. They religiously practice the culture but in Muslim people, for some reason, cultural activities are not accepted like that. It is a sort of monothetic ideas, so it was very bad for ICH properties of the then East Pakistan and now Bangladesh.

War: You all know about the independence war of Bangladesh in 1971. Genocide carried out by Pakistani army caused the death of 3 million people and a huge loss of properties. Pakistani people, with the help of Razakars, the collaborators of Pakistani army against Bangladeshi people, thought that cultural activities and intelligentsia activities are not good for their rule, so they should be killed first. So they planned and mercilessly killed many professors, many singers and many ICH stakeholders during the 1971 war.

Major Natural Disasters & it's Effects : Flood

Year	Inundation	Death	Crops loss	Financial loss
1987	38%	1657	1.5 million tons	BDT 35 billion
1988	60%	2379	3.2 million tons	BDT 40 billion
1998	75%	1050	4.5 million tons	BDT 142 billion

Major Natural Disasters & it's Effects

River Bank Erosion

According to "World Disaster Report-2001" published by IFRCS about 1,000,000 people are affected every year by river erosion and 9000 hectares of cultivable lands banished in the river. Most of the affected people become homeless for an uncertain period.

Political and others: Recently, a religious fundamentalist group burnt out a music school named Ustad Allauddin Khan Sangitalay in Brahmanbaria district of Bangladesh, along with all its musical instruments, memories, mementos and all ICH properties of Ustad Allauddin Khan, the great music maestro of India. Another group conducted a mass torture of some *baul* singers. *Baul* singers are the humanist singers and fundamentalists are always against the humanism. So, they tortured them to frighten them not to practice *baul* singing. From 1999, bombing on cultural activities and cultural places like festivals and *melas*, started by fundamentalist groups, and now it has been reduced for government step. This attitude is a disaster not only for Bangladesh I think but it is for the world also, as we have observed ISIS activities of destructing cultural artifacts, Taliban activities destructing statutes etc. So, I think it should be addressed.

I am going for disaster management in Bangladesh. Bangladesh government has taken steps for managing disasters, taking into consideration the Hyogo Framework of Action 2005–2015, and there are (A) National Policy and Coordination, (B) Local Level coordination, and (C) Disaster Management Action Matrix.

I am just showing you, the regulatory frameworks for National Policy and Coordination are: (a) Disaster Management Act, (b) National Disaster Management Policy, (c) National Plan for Disaster Management, (d) Standing Order on Disaster, and (e) Guidelines for Government at all levels.

National mechanisms for policy guidance and coordination are: (a) National Disaster Management Council, (b) Inter-Ministerial Disaster Management Coordination Committee, (c) National Disaster Management Advisory Committee, (d) Earthquake Preparedness and Awareness Committee, (e) National Platform for Disaster Risk Reduction, (f) National Disaster Response Coordination Group, (g) Cyclone Preparedness Programme (CPP), (h) CPP Implementation Board, (i) Committee for Speedy Dissemination and Determination Strategy of Special Weather Bulletin, (j) Committee for Focal Points Operational Coordination Group, (k) Coordination Committee for NGOs Relating to Disaster Management, and (l) Disaster Management Training and Public Awareness Task Force.

The local level coordination has the followings: (1) City Corporation Disaster Management Committee, (2) District Management Committee, (3) Upazila Management Committee, (4) Pourashava Management Committee, (5) Union Management Committee, (6) Local Disaster Response Coordination Group, and (7) Multi-level Multi-agency Disaster Incident Management System.

Finally, the Disaster Management Action Matrix has the following strategy goals:

- Professionalising the disaster Management System
- Mainstreaming disaster Risk Reduction and Climate Change Adaptation
- Strengthening Institutional Mechanisms
- Empowering at Risk Communities
- Expanding Risk Reduction Programming across hazards and sectors
- Strengthening Emergency Response System
- Developing and strengthening Regional and Global Networks

I have to say that the IRCI is doing a very good job to unite us against disaster and safeguarding ICH, it's the new field for us also. We didn't calculate the ICH property loss during the disaster but from now on we will try to do. Thank you very much.

DISASTER AND ICH: BANGLADESH CONTEXT

Md. Amanullah Bin Mahmood[1]

Good afternoon. My name is Amanullah Bin Mahmood. I am working with the UNESCO Dhaka Office as a Science Officer. Many thanks to IRCI authority to inviting me, and my office also is very happy to participate in this event. My responsibility is science and disaster environment. We have a dedicated culture officer in our office, and actually this is the inter-sectoral issues and we are working together here.

1 UNESCO Office in Dhaka

Bangladesh

- Area: 147,570 sq. Km
- Population: 152 million (2015)
- Projected Population: 167.37 m. (2019)
- Population density: 1063 per sq. km
- Life expectancy: 70.7 (2014)
- Per Capita Income: 1314 USD (2014-15)
- GDP Growth: 6.51% (2014-15)
- Administrative Unit:
  - Division: 7
  - District: 64
  - Sub-district: 544
  - Union: 4543

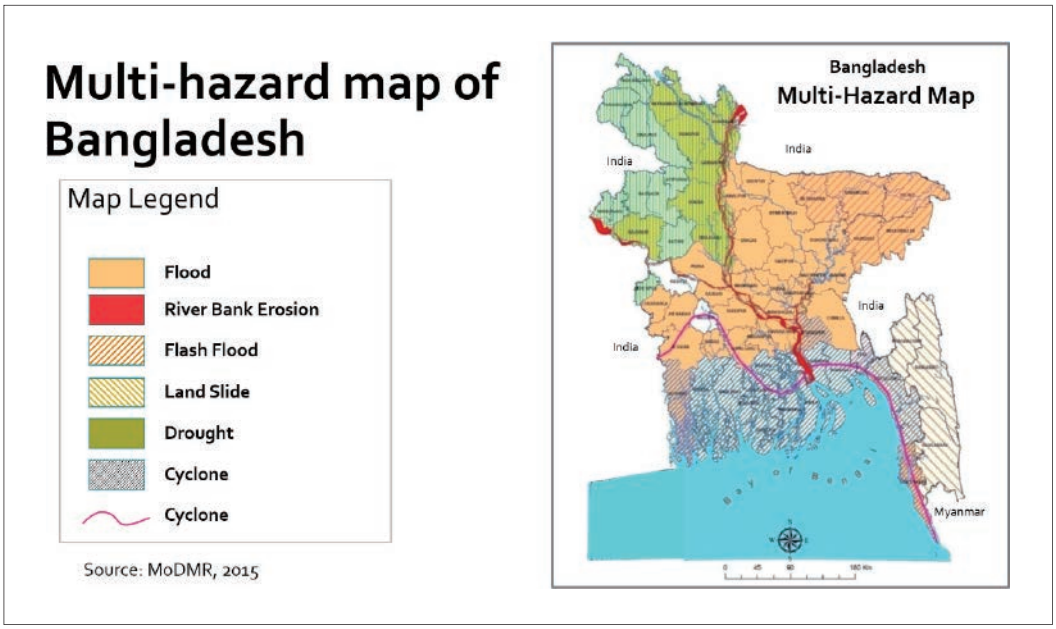
Here is my presentation content. I will discuss first about some basic things, then the vulnerability of Bangladesh, and main disasters: my colleague Selim has already described this, so I'll just a little bit discuss about that. Then the Bangladesh disaster management, he also already covered that. Then the policies, Bangladesh Seventh Five-Year Plan, intangible cultural heritage of Bangladesh, and then I'll try to link with the present situation of intangible cultural heritage and the disaster situation in Bangladesh. After that, our activity in intangible cultural heritage, and some way forward.

I know all of you are aware about Bangladesh. Bangladesh is a very small and populated country. Our total area is about 147,570 km^2 and very populated country. We have 152 million in 2015, the total population and we are expecting, in 2019, 176 million. And population density is 1,063 per km^2, life expectancy is 70 years in 2014 and our per capita income is 1,340 in 2014 to 2015 and GDP growth is 6.51. We administratively have seven divisions, 64 districts and 544 sub districts and we have small administrative units, called the union 4,543.

And as part of the study of the UNDP, our Climate Change Strategy and Action Plan adopted that. Bangladesh is the number one most vulnerable country due to the cyclone. Per 100,000 people, our death rate is 32. And we are sixth most vulnerable country due to the flood. And here are the few disasters of Bangladesh, already Mr Selim covered that. I'll just mention that our main disaster is flood.

We are habituated long time about the flood; we are a flood prone country and we are regularly habituated about the inundation. But inundation is sometimes going to be flood; it damages our crops and different types of properties. Then the cyclone – major cyclone with most casualty happened in 1970, when more than 500,000 people died.

In addition to that we have the tornadoes, river bank erosion, 5% of our land eroded every year. And other disaster, even that cold wave sometime and we are the most vulnerable country due to the earthquake, then other disaster is drought, landslide, excessive rainfall and water logging and another two man-made disasters here, the building collapse. Nowadays it's very frequently happening in Bangladesh, and the fire is another man-made disaster.



Here I mentioned a multi-hazard map of Bangladesh, you see the whole Bangladesh here, and the legend. Actually all over the country, except this region, is habituated to flood. We have three major rivers: this is the Brahmaputra, this is the Ganga, in Bangladesh, it's named as Padma, and this is the Meghna. These are the three large rivers that drained out in Bangladesh and fall in the Bay of Bengal, and this part is the piedmont area of the Meghalaya Hills, it's habituated to the flash floods. And this is the drought-prone area and this is the cyclone-prone area, and this is landslide-prone area and the red color is showing actually the river bank erosion prone area.

Our disaster management administration is our National Disaster Management Council, which is headed by our Prime Minister and after that all of these national committees and national activities here. This is our main Ministry of Food and Disaster. Now it's divided into two ministries, Food and Disasters Alert.

Here is our Policy Regulatory Framework, I just mentioned here the policy names, so already Mr Selim mentioned the National Plan for Disaster Management. It's created in the 2010, and Bangladesh Climate Change Policy and Action Plan 2009, National Adaptation Plan – NAPA, Bangladesh Disaster Management Act 2012, Guideline for Disaster Management, Standing Order for Disaster Management and now we are adopting the Seventh Five-Year Plan. And, we have adopted the Sendai Framework for Disaster Risk Reduction in our five-year plan and we have adopted four goals of the Sendai Framework in our five year plan.

And now it's time to talk about the intangible cultural heritage of Bangladesh. Actually three intangible cultural heritage is inscribed on the representative list of UNESCO. First one is the *baul*-song. This is the oral tradition. It's inscribed in 2008. It's a mystic song about Bangladesh. There are lots of *baul* who are living in Bangladesh. This is the *Jamdani*. *Jamdani* is the weaving technology. It's handicrafts. This is the *Mangal Shobhajatra*. It's a Procession of the Good Hope. Now I try to interlink with the location and the intangible cultural heritage.

At the river-bank prone area, lots of weavers are living over there. This is a drought-prone area, and lots of pottery-related people are living there. The indigenous people who are living there, they have lots of strong ICH, local technologies, local beliefs and festival over there. This is the Dhaka City. Old Dhaka City has lots of traditional things: their beliefs, their festivals and lots of

things. Old Dhaka City is one of the most vulnerable areas due to the earthquake. This is the cyclone prone area and here, our natural cultural heritage, the Sundarbans, one of the largest mangrove forests is located here. And there are many beliefs over there. Before going for extracting resource from the forest, they have few goddesses there, it's called *Bonbibi*.

In the definition of the Convention for the Safeguarding of Intangible Cultural Heritage 2003, Article 2, there are lots of things mentioned, and two things I highlighted here. The preservation and protection, and Article 11, role of state party. Here I just highlighted in view of the safeguarding – how to ensure the preservation and protection, it's when you are thinking about preservation and protection. It's obviously come to the safeguarding from the disasters and losses.

In National Plan for Disaster Management, in the Strategic Goal 4, 'Empowering the Communities at Risk', two things are mentioned: the key target to identify the community and the household level risk, and action is in the risk of diversified group including women, children, and elderly people. Intangible cultural heritage actually is linked with the community. There are lots of community, craftsman community, weaver community, the *baul* community, and so on.

Already we are adopting these types of safeguarding but our policy does not mention that the intangible cultural heritage protected here, but now the time for protecting here. Our current policy is adopted during 2010 to 2015, and now the government is thinking about new thing. So, this is the time we are trying to push something to adopt these.

And now I am talking about a few of our projects. In UNESCO Dhaka, they are currently conducting a workshop on ICH. Under our project 'Strengthening National Capacities for Safeguarding Intangible Cultural Heritage for Sustainable Development in Bangladesh', we are adopting two types of activities: the capacity building and the pilot activity. Under the capacity building, implementing the 2003 Convention, then the inventory of ICH in Bangladesh, and nomination of the ICH. Actually, there is no government adopted list of ICH in Bangladesh. So, we are trying to push this. In the pilot activity, we are trying to develop a methodology to identify ICH.

Now, I talk about the way forward, what we are expecting or what we are thinking. A complete

inventory of ICH in Bangladesh, it's very necessary to adopt the policy and listing ICH for preservation and conservation. The integrated safeguarding measures for ICH and policy level intervention. I already mentioned that we need to put this in our policy. And linking the safeguarding and disaster management for ICH and last one is cooperation and partnership in research and planning for disaster management policy in ICH. Thank you very much.

INTEGRATING LOCAL AND INDIGENOUS KNOWLEDGE IN DISASTER RISK MANAGEMENT: LEARNING FROM PHILIPPINE COMMUNITIES

Fatima G. J. Molina[1]

Okay, good afternoon. So, first of all, thank you for this opportunity to be able to share about the Philippines experience. I will share about the integration of local and indigenous knowledge in disaster risk management.

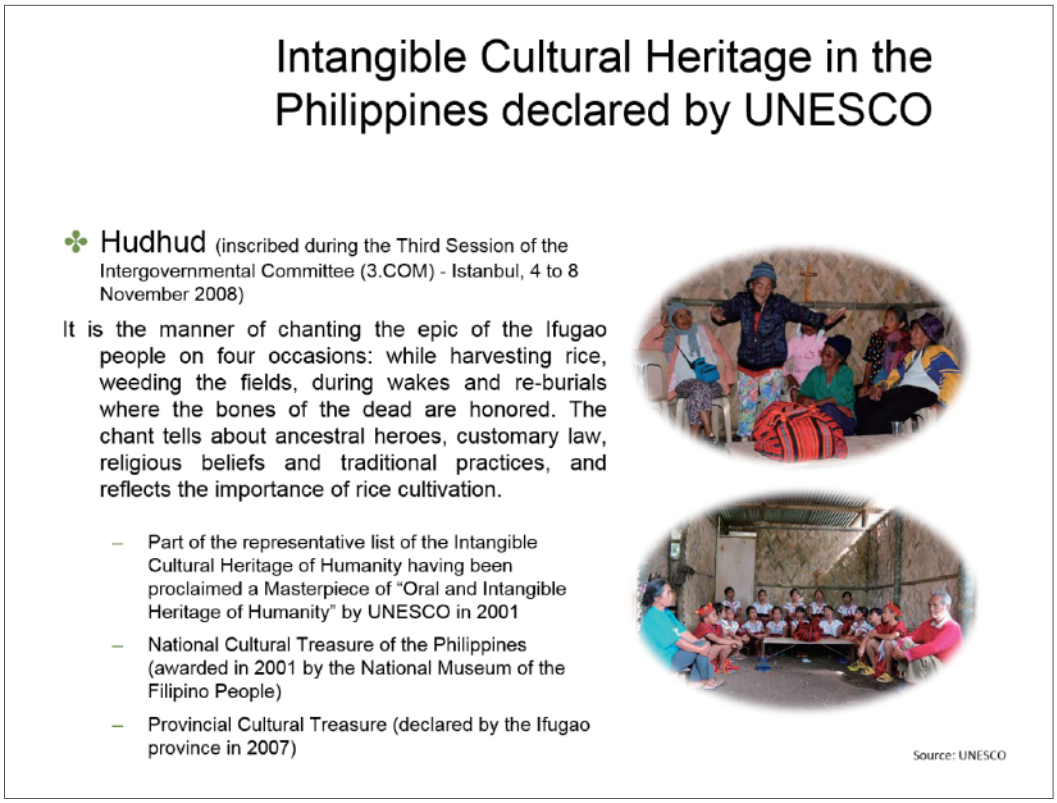
Firstly, I would like to share something about my organisation. I am from the Center for Disaster Preparedness, which was established in 1999; so it has been in the field of disaster risk reduction for the past 20 years. Before, we started as a very small organisation. I am one of the members who came in the second round and before we were only five. But right now, we are presently 54 people in the organisation. We have branched out from one office to three offices around the Philippines.

I don't know if I should be thankful to the disasters, but then, I think because of the changing types of hazards in the country, there is more need for people like us who are in the field of disaster risk reduction. So, we have operated and partnered with more than 15 countries and Dr Shaw has been with us in different projects with the UNESCO and other engagements internationally.

For the outline, I will present first the different examples of intangible cultural heritage in the Philippines, and also the Philippine disaster profile; followed by the examples of actual local and indigenous knowledge, which are useful for risk management, and also publications.

Our first example of ICH is called *Hudhud*. So, it was inscribed as one of the representatives for ICH in 2008 but it was recognised by UNESCO in 2001. It is actually an epic, but the one that was registered in the ICH Registry is the manner of chanting. *Hudhud* is sang in the northern part of the Philippines by the Ifugao indigenous peoples, which is a matrilineal society. It is usually sung by the women. So the chanters are women and women's brothers occupy a higher position in singing the chants versus the husband of the lead chanters. It is chanted on four occasions, like in the harvesting of rice to appease the gods, to have a bountiful harvest, and it's actually also part in weeding the fields so they sung it whenever they weed the fields- when they remove some of the weeds in order to have healthier produce; and, lastly, it is actually sang also during wakes and rituals for the soul to transfer to the other life and welcome the divine being in prosperously. It is actually also a part of honoring the dead. Therefore, the people of the Ifugao also practice ancestor worship. They chant about the ancestral heroes, the customary laws and religious

1 Center for Disaster Preparedness, Philippines



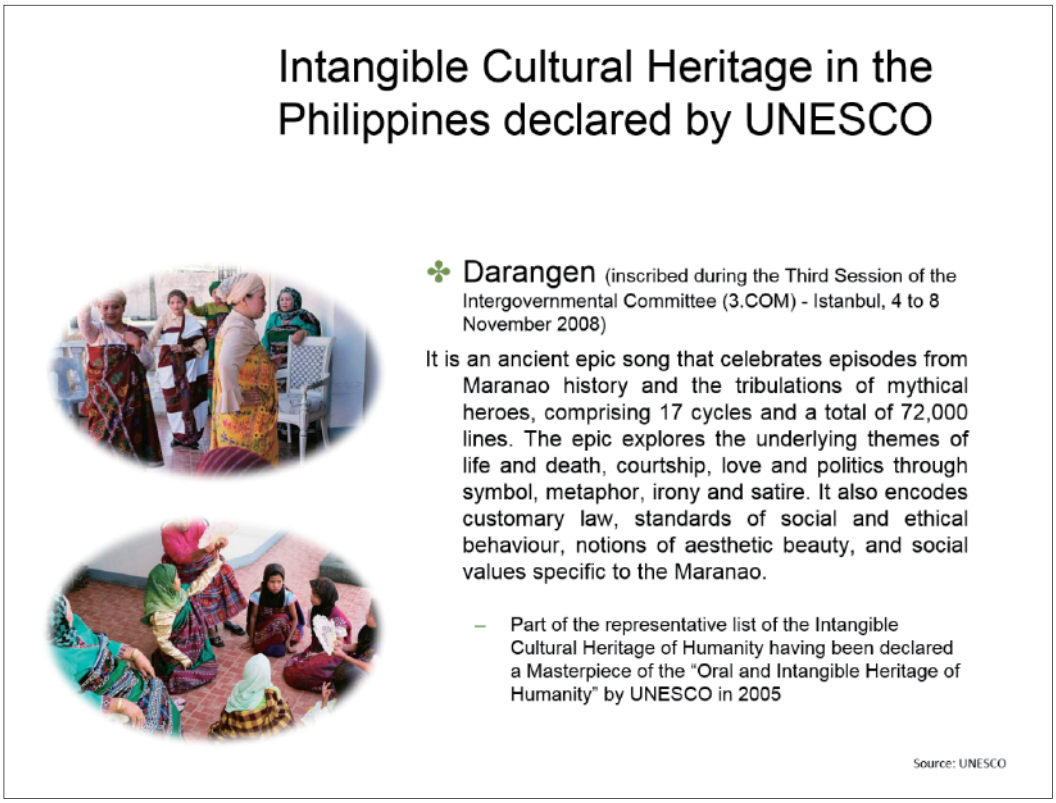
beliefs. So, this is a good opportunity to look at how it can be useful for risk management. If we include customary laws and integrate risk reduction, chanting can be a form of early warning system. In the photo, there are also performances, so the chant has different dance as well. So, it's a performance also.

The next ICH is *Darangen*, which literally means to narrate a song. This is sang in the southern part of the country, Mindanao Area by the Maranao people. So, it is believed to have existed even before Islam was organised in Mindanao. So it was believed to be founded in the 14th century and it's written through an ancient language that is based in the Sanskrit, but at present it's translated in Arabic, because most of the chanters are Muslims.

It is an ancient epic song that celebrates the episodes of the Maranao history that caters to the customary laws, mythical heroes and it is comprised of 17 cycles. So, it's a very long process. The chanting process is very long and it's performed both by men and women in the area and it's composed of 72,000 lines. So it's a very, very long chant. It explores underlying themes of life and death, the concept of after-life as well in Maranao and courtship, love and politics through the symbol of metaphors. It was inscribed also in 2008 in UNESCO but was recognised as early as 2005.

Right now, our indigenous people in the Philippines really face as well the adverse impacts of disasters. This is one of the statements of an Ibaloi person, like Ibaloi indigenous peoples' member. The Ibaloi are also from the northern part of the country, which are neighbors of the Ifugao. This is the statement translated in English: 'you must see the devastating events that are happening to our place, floods, storms, that is what is happening to our people. My farm products and those of my people and the places where we used to plant are all gone'.

So, you see, the people's lives are altered as well because they no longer have a healthy place to



plant their vegetables and especially the paddy rice because it's the main source of subsistence for the people. The people are actually affected mainly by flood and this also results to erosion. Why is the Philippines at high risk?

In the ranking of the United Nations International Strategy for Disaster Risk Reduction, the UNISDR, the Philippines falls next to Vanuatu as one of the high-risk countries in the world and this is due to its location. Here you can see that the Philippines is in close proximity to Pacific Ocean. It's part of the Pacific Typhoon Belt and it is also part of the Pacific Ring of Fire. You can see that its location becomes a favorite destination of hydro-meteorological and geological hazards.

And right now, the Philippines is able to define certain examples of local and indigenous knowledge. Based on the UNESCO research that we conducted together with UNESCO Jakarta and Paris, entitled, 'Strengthening resilience of coastal and small island communities', we were able to document the local knowledge of the people in the coastal and small islands.

So, maybe this project can explore documenting some ICH for the mountain areas, and also the everyday in the urban areas also what are other possibilities now. For us, we adopted the definition used by UNESCO where local and indigenous knowledge is seen as cumulative and complex bodies of knowledge, know-how practice. So you see, it's not just on the indigenous knowledge itself but the local practices. So it's more holistic because it sees as well, what are the everyday activities that people do, which is different from ICH which is more focused on the rural areas. But now it integrates practices also in the peri-urban and urban areas.

We see it as something communal, so it is extended in different generations. So out of this research we developed a framework together with the people. Here is an example of different categories of the local and indigenous knowledge. You can see here at the diagram that there are

Sound for provision of Early Warning

Color	Alert Level	Kanungkong Warning Signal
White (Ready)	Normal	0
Yellow (Get	Alert (There is	5 strikes at 20 minutes interval
Orange (Go)	Prepare for evacuation or proceed to area (There is possibility of flooding)	10 strikes at 20 minutes interval
Red	Full evacuation encouraged (Forced evacuation if necessary)	Non- stop (15 strikes at 10 minutes Non-Stop (20 strikes at 5 minutes
Green	Back to normal	

Figure 2 A and B: People testing the *kanungkong* (Source: Dagupan City Information Office) and Table of Warning Codes adopted in Dagupan City (Dagupan City Government, 2008; Molina, 2016; Victoria, 2008)

five examples. There is material culture, observation of natural environment, traditional preparedness practices, animal behavior and faith-based practices.

So, we included the faith-based practices because we believe that we should just not focus on the natural environment but also the social experiences that the people do in order to adapt in the changing context of risks and as the Philippines has four approaches for disaster risk management process: mitigation, preparedness, response and recovery.

In this research we tried to look into the integration in the different pieces of disaster risk management for ICH or LINK. And we ask about in the box below. We documented what is it about, it's duration, it's frequency, so as to know if it's relevant because you see the LINK is not static, it's changing over time. Sometimes some knowledge are no longer relevant today because environment is also changing and the people inhabiting an environment is also changing because of migration and many other things.

One of the examples that we were able to get from the people is the sound that they do in order to provide early warning for flooding. This sound is made out of an instrument which is made up of bamboo and locally called as the *kanungkong*. This is used by one of the research areas; it's an urban area in the city of Dagupan in Northern Philippines.

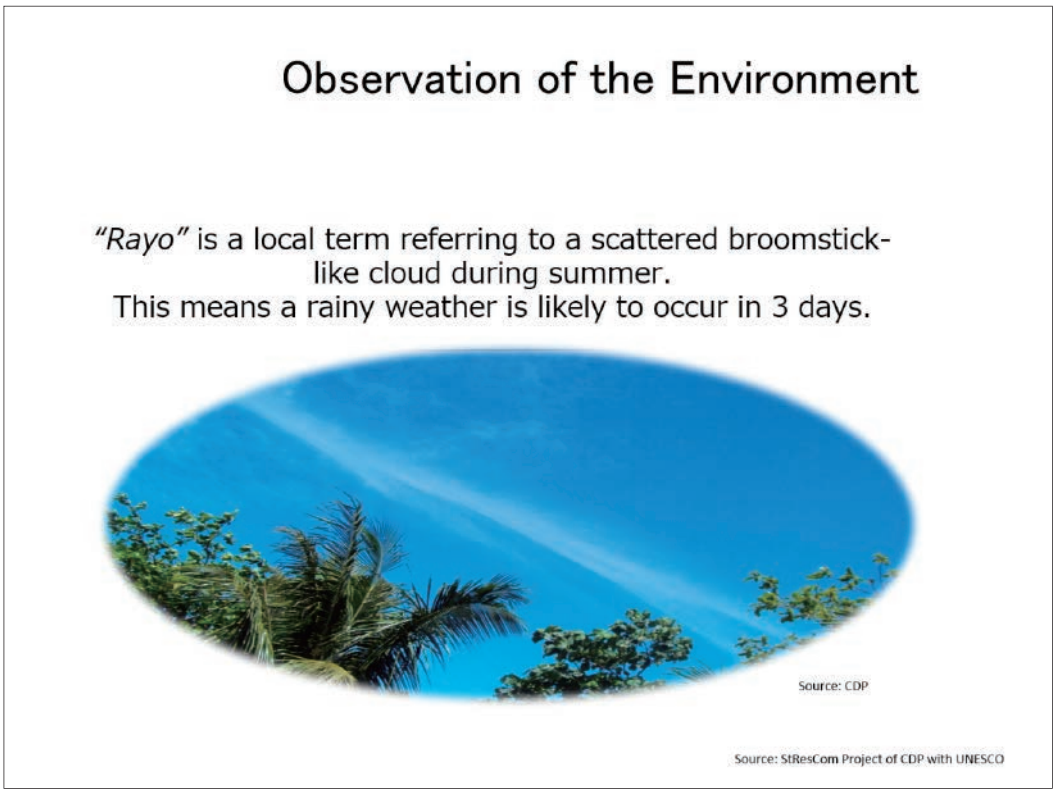
You see that it has different meanings. A sound has a corresponding meaning. At first it has also a corresponding color so as to easily disseminate the information. For the white one, it's assigned that the people have to get ready once the *kanungkong* is set up. So no sound is made yet, but it's already put in place. And the second one is the yellow one, means people have to prepare. So it's already an alert, and every 20 minutes five strikes are played. Each village is divided into a zone and in each zone, there is someone who carries the *kanungkong* around the area. You see

that it is very focused, it's really divided among the community people, so that they can easily communicate with each other. So, it's really a huge responsibility of the messenger. One wrong strike, like if he commits a mistake, it can affect the overall early warning process. So, for the orange one, ten strikes for every 20 minutes and then the red one, it's nonstop 15 strikes in every 10 minutes. So, it means that full evacuation is needed.

So, what's the meaning of other colors? The orange one is for the preparation for evacuation and the red one implies actual evacuation of the people. For example, the white one will be activated if the status is that there will be a high-tide forecast accompanied by heavy rains. The city also has to get forecast from other agencies, for instance, there is flood alert forecast from the Agno Flood Control. Therefore, it means that it is inter-governmental. Other groups and agencies must act upon the situation. The city has neighboring municipalities and these municipalities are surrounded by the Agno River. So there is a warning from the Agno River System Control, goes down to the city, the city down to the communities, the community leaders down to the zone leaders. So, there is a system.

Who are the corresponding villages that respond to it? There is the village like Lasip Chico and Pogo Grande, these are the high risk zones. The warning starts from the high risk zones, then to the medium risk zones, and then to the low-risk zones. So, the village officials in these zones act upon the situation and also report to the city level government agencies involved in the disaster risk management such as the City Disaster Risk Reduction and Management Office (CDRRMO).

The indicator for flood levels is actually anthropometric, in a sense that the measurement is based on the human body to link it with the people's experience, like example for the hips, which is usually two feet, the knees, one foot. So, you see that the peoples' measurements are also arbitrary. So, the government needed more standardised by putting corresponding metric measurements in the form of feet. So, there is actually a corresponding responsibility according to the flood level.



So here we can see in the presentation that it's possible to integrate indigenous knowledge in the practice, given that the government supports it, since there is a system already in place.

Okay, in this photo, we observe the people performing a song. This is a faith-based practice in Alabat Island in Quezon Province. Usually the people in the islands suffer drought also in the area. So, what they do is to sing a song to their Patron Saint of the farmers*, San Isidro Labrador,* or *San Isidore*. I actually asked one of the oldest residents in the island. When I did my field work, she was 91 years old and it's difficult for her to sing but she tried her best to sing about it. And its lyrics mean is more of peace. She is praising *San Isidro*. She is asking *San Isidro* to humbly give them rain because their plants are dying already and it's a form of veneration also.

Another one is the local practice on food preservation. Here, we can see that the indigenous knowledge can also become a form of survival. It's not just about providing early warning systems, it's not just about putting the people in safe zones, but it's also for their survival. So, there is also a need to see how the food banking process is done.

You see, we teach people to become more self-sufficient. They are not just receiving relief, so we have a manner of food preservation. One of them is drying, so this is practiced actually across the Philippines where they dry fish, vegetables, to have alternative source of food when the rainy season comes, and in Rapu-Rapu Island in Albay, some of them have nature as the refrigerator. How? They dig the soil and they put root crops to preserve it, which is also the same with the practice of the people in Fiji. You see a lot of different countries in the Asia-Pacific area have a lot of common coping mechanisms.

This one is the observation of the environment. Here you can see the convergence of nature and knowledge come together. *Rayo*, this is what we call like street lined sky; it's a local term referring to scattered broom-like clouds during summer. So based on the people's experience after they observed that *Rayo*, the clouds, it rains after 3 days. But now due to the climate change this can change, it can be shorter or longer days. So, we see that's how the local knowledge becomes not static because of the changing seasons as well.

Here are some examples of the materials that tackles about local indigenous knowledge integration. In the project we were able to produce some material, actually Dr Shaw was one of the co-authors of this material, the local indigenous knowledge for community resilience, with UNESCO Jakarta, and they were able to produce a joint article together with Dr Lisa Hiwasaki of UNESCO Jakarta, Dr Luna the director and one of the research team members, my sister, she was able to write in Springer also on the local knowledge and Casiguran and I was also able to write in Springer for Dagupan city. So, it's about inter-regional transfer.

What is the relevance of local knowledge for disaster risk governance? Right now, participatory governance has to recognise local indigenous knowledge because it is a capacity of the community people. So, once there is recognition, it would be easier to realise its value, its worth for policy and practices and also partnerships with different sectors. In the Philippines, there are a lot of opportunities of indigenous people's participation in this governance. But this is yet to be written.

Right now we are doing policy advocacy for the amendment of the Republic Act 10121, the Philippines Disaster Risk Reduction and Management Act, there is community basis doctrine in the past but the IPs are indigenous people, so they are not really identified as seen with Bangladesh. I think it's really important for us to advocate higher of cultural heritage, both tangible and intangible cultural heritage, and also one of the challenges is that even in our structure the National Commission for Culture and the Arts is not part of the structure of the National Disaster Risk Reduction and Management Council. I think it's very important for us to advocate at the

policy level to have longer impact and to have more sustainable efforts for integration of ICH and disaster risk reduction. Thank you.

NARRATIVES OF RISK AND COPING IN RESPONSE TO TYPHOON HAIYAN IN SELECTED COMMUNITIES IN THE PHILIPPINES

Soledad N. M. Dalisay[1]

* The following presentation is based on her recent publication (below), which was awarded 'Highly Commended' in the 2017 Emerald Literati Network Awards for Excellence.

> Dalisay, S. N. M. and De Guzman, M. H. (2016). Risk and culture: the case of typhoon Haiyan in the Philippines. *Disaster Prevention and Management: An International Journal*, 25 (5), pp. 701–714.

Good afternoon everyone and I will be sharing with you this afternoon the findings of a study we did. It's a case study of Typhoon Haiyan in three affected communities in the Philippines. So this is co-authored, the papers are actually co-authored by a graduate student from the Department of Geography, while I'm from anthropology.

These are some statistics about Typhoon Haiyan. So everybody, I suppose, is familiar with the really devastating typhoon which hit the Philippines in 2013. It left so much devastation and for the objective of our study we tried to provide an understanding of the social and cultural contexts that shape risk perceptions in relation to evacuation during Typhoon Haiyan. The study was actually commissioned by the Department of Science and Technology. They came to us and asked us to do the study because according to them we already did all the science but still people did not evacuate and so much devastation occurred, and so they're trying now to understand the social and cultural contexts that shape the risk perceptions. This is the geographical focus of the study; we looked at three coastal communities, the Tacloban City, Guiuan, Eastern Samar and San Francisco Cebu. But there were different conditions post Haiyan in these three communities. The three study sites are located in Central Philippines in the middle of the map of the Philippines.

Okay, during Typhoon Haiyan there were areas where loss of lives and property was great and losses were confined to simply the property. In Tacloban City, we have this classic photograph of the ship that was washed on shore because of the strong storm surge. So there was so much devastation in Tacloban City as well in Guiuan, Eastern Samar, but in this island community in San Francisco Cebu, where everyone had evacuated, the loss was confined to property. There were no lives lost in this island community in the Philippines, okay. So, we are trying to do a comparison now of what happened and why people evacuated in certain areas and in certain areas why they did not evacuate.

We devised this conceptual framework which was based on or inspired by Douglas and Wildavsky's Cultural Theory of Risk. So, we see here the social and cultural contexts that shape

1 University of the Philippines-Diliman

risks and vulnerability perceptions and responses to natural hazards as actually linked to the physical environment. So, concepts about the physical environment in relation to natural hazards are shaped by social-cultural contexts.

These are some of our findings. I tried to confine my presentation this afternoon to findings that would be relevant to ICH. When we ask people why they evacuated or why they did not evacuate, they gave us the same answer which was '*Sanay na kami dyan*' or we are used to it. In some areas like in San Francisco, Cebu, they were used to evacuation because the local government had already been implementing effective evacuation programme and people knew where to go, what to do in case there was a call for evacuation by the local government. And by the way, San Francisco Cebu was also a recipient of the Sasakawa Award for Disaster Risk Reduction. Whereas in Tacloban City and in Guiuan Eastern Samar, they also said that they were used to the typhoons because the Philippines is actually situated, as Fatima said, within the Pacific Ring of fire and we're visited by around 20 or more typhoons a year. So they said we are used to it and we've already developed ways of dealing with a hazard in our daily lives. And so, they did not evacuate because they thought that Haiyan would be like any of the other typhoons that they've encountered in the past. What they did not expect was the storm surge and that was what cost much of the devastation.

Ties that bind, so in all the three communities, relatives were a valuable resource. Because the roads were devastated during the typhoon, the national government were able to bring aid into the affected communities, it took about 3 days. So before the government came, the relatives were already there helping their fellow relatives.

They had a system in place they called the *pauswag* wherein even before the typhoon hit, relatives and friends already accommodated, those with houses that were made of concrete and were deemed to be safe from the storm. They were already accommodating the relatives and friends into their homes. They housed them there during the storm and even after the storm while they were cleaning up. They call it the *pauswag*, it's a traditional practice that has been in place in Guiuan, Eastern Samar.

There is a similar practice called the *pagpapadagos* in the Bicol region, another area that's often visited by typhoons in the Philippines. In terms of probably finding commonalities and scaling up of ICH, particularly in the context of involving relatives in DRRM, I suppose there are many other examples in other parts of the Philippines. It just so happened that I did research in Guiuan and in the Bicol region so that's what I know. Probably if we expand the research into other areas we will find similar social systems in place as well.

And then also in terms of ethnicity and identity, people in Guiuan Eastern Samar and in Tacloban City were saying that *tuminongnong* — it's a Visayan term for those who are born and raised in the area. So, for our informers they felt that the *tuminongnong* possessed greater resilience to natural hazards because they have a network of relatives and friends already in the site as compared with new migrants who are newly establishing residence in the site and therefore they are more or less left on their own. That's why in the more rural areas like in Guiuan Eastern Samar and in San Francisco Cebu, where everyone was a relative of everybody else, the support system was great. But in Tacloban City, which is an urban site, composed of migrants coming from many places. The relatives were not really with them, and so they were more or less had to help themselves.

They also had local knowledge which they said they saw even before as warning signs, even before Haiyan, like for instance the red skies the night before the typhoon hit. It was a sign of a strong typhoon or the halo around the moon they said means rains soon. So they had noticed this, also they witnessed unusually huge waves, particularly by the fisher folk. These were some of the warning signs that was in place in the three sites.

They also had local knowledge of wind that told them when it was safe to go back to their residences. The local term is *kanaway sa timog*, which referred to the final rush of wind that signified the end of the storm. So the elders or elderly informants told us that they had this local knowledge, but many of the younger people in the communities no longer knew how to read the signs. They relied more on news from the radio or from the television. So, there is a challenge now on how to promote ICH here.

They also had ways of identifying safe and unsafe spaces based on the impending hazards. They also knew how to secure the roofs of their houses, they had technology of tying the houses to the ground; some were able to do this.

And then in terms of gendered aspects, while many of the literature pointed out the vulnerability of women in the face of hazards, the study also showed that men can also be vulnerable. Women were vulnerable but men could also be vulnerable because in this case, in the context of machismo, the man stayed behind to protect their pieces of appliance and their property, while they made sure that their wives and their children were sent to the evacuation centers. So they were the ones who were exposed to the hazard. Even in that small island where everyone were supposedly evacuated, there were two men who stayed behind because they had to protect their possessions not only from the hazard but from looting after the storm, and that was what they told us.

What are some of the recommendations for community level DRRM considering ICH. First of all, we thought that in terms of capacity building, friends and relations could be a valuable resource during disasters. They could be involved in formal DRRM programmes and provided with incentives because there is some of the people were skeptical of evacuating to the evacuation centers designated by the local government. In fact in Tacloban City, it was in the evacuation centers where some of the people died because they were also affected by the storm surge. The evacuation centers were situated along the coast and so the storm surge was able to reach that area. Because in the evacuation centers also they were housed with people they did not know, not only their neighbors but there were other people also in the evacuation centers. And so they did not feel safe, so they preferred the homes of their relatives. But not everyone has a relative in safe space. So I have some other recommendations for that.

Also to include local knowledge in communicating risks from hazards, we suggested that using traditional channels of communication. The usual channel that was used was through the local government and the mass media, but there are ways in which information is also disseminated in the communities through people that they knew and were part of their social networks, so this can also be tapped in DRRM programmes.

And then to develop safe evacuation centers for those who need this in their sites, we thought that it would be good to identify and designate a site or a structure that will serve as a permanent evacuation center for specific communities. This could be situated in recognised safe areas. The centers could also serve as disaster museums where information, education seminars can be held when it is not used for evacuation. We've been told also that having a center that's dedicated solely for evacuation may not be cost-effective because nobody knows how many times in a year you need to evacuate people. So, we thought that it would be good to have other purposes that are disaster related also because right now the current evacuation centers in the Philippines are multiple purpose centers. They are schools that serve as temporary evacuation centers. Therefore, when there is evacuation, schooling is interrupted because sometimes the people have to stay in the evacuation centers for a long period of time. Or if there are other purposes for the evacuation center, like it could serve as a gym or any other community activity for the long term, the buildings might be retrofitted for other purposes, other than evacuation. And therefore you lose now its value and its function as an evacuation center, so we have this recommendation.

Candle lighting ceremony during the 1st year anniversary of Haiyan in Tacloban City

And then, looking at developing social memory. Social memory frames people's responses to hazards and the lessons learned from typhoons Durian and Haiyan. Because there was Typhoon Durian after Haiyan which was also very strong but not as strong as Haiyan, and the social memory could be done through sustained community rituals and ceremonies that commemorate people's resilience efforts after the typhoon. So it's not much remembering the devastation, but more remembering the lessons learned. When we were talking with our informants, they were telling us that they fear that the very young children would lose the memory of Haiyan and those who were not born yet would have no experience of Haiyan and they would go back to their complacent ways. This is an example of the candle-lighting ceremony that was held during the first year anniversary of Haiyan. This was LGU led actually and while of course there is this separate ceremony to commemorate Haiyan, the same ritual could be integrated with other festivals and rituals that are already ongoing, that have been there in place in the communities for a long period of time already. So that's the candle-lighting ceremony.

As the final recommendation, we also felt that DRRM programmes have to be linked to broader human development and environmental protection concerns. Usually DRRM programmes focus on the hazard, but in the everyday lives of people, hazards are only one part of their many concerns. So when faced with a hazard, they may prioritize those other concerns over the hazard and hence refuse to evacuate. This may take a very, very long time but there could be a need for a more comprehensive human development programme that would address this multitude of concerns so that this would be able to reduce people's vulnerabilities and develop greater resilience.

And by way of going forward in terms of research we felt also that we need to do more research on viable channels for the transmission of local knowledge to the young that are, of course, taking into consideration the local context, social, environment, and the local cultural contexts of

communities. And this will vary depending not only on ecological zones but also whether the communities are urban community or a rural community.

It would also be good to look at the genesis of new myths and legends that arise in disaster contexts. In Guiuan, we encountered a new legend that emerged now after Haiyan. So it would be good to look at the narrative of the myths, who are the transmitters of the myth, the lessons that have been imparted through those myths that arise and the contexts in which these emerged. These are some of the suggestions.

Also, to look at the dynamism of ICH as a function of changes not only in the physical environment but changes in the socio-cultural world of the bearers as well. ICH is part of culture and the resilience of culture is also based on its dynamic nature, so it's important to look into this.

And also the identification of novel ways of integrating ICH into actual DRRM programmes. Because while our National DRRM Act RA10121 actually has a provision on the incorporation of local knowledge into DRRM programmes, we really have to find out who are implementing this already and if these are not yet being implemented, why are these not being implemented. I suspect there are successful examples in the field now but we have to document this and share this to argue more strongly for the incorporation of ICH in DRRM programmes.

ICH AND DISASTER RISK MANAGEMENT IN FIJI

Ilaitia Senikuraciri Loloma[1]

Good afternoon everyone. *Ni bula vinaka*.

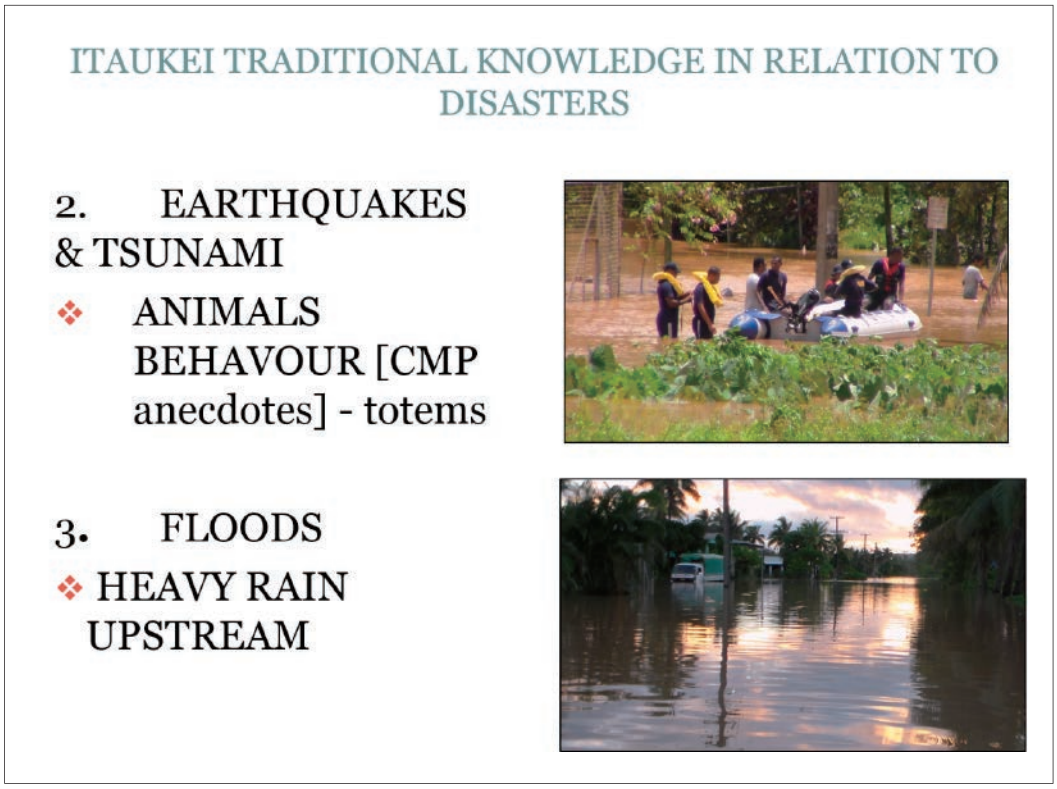
Fiji's presentation includes a brief historical account of events that unfold in the past centuries thus forming its social, economic, and cultural cosmology. The presentation will also include a brief report on Cultural Mapping Programme and from which emanate the theme for this conference, 'ICH in relation to disaster risk management and its challenges'.

The Republic of Fiji consists of 333 islands; located within hurricane-prone area in the South Pacific Ocean with our neighboring island states. This information is made available in the national telephone directory thus the public are aware hurricanes.

In February 2016, Fiji was struck by a category 5 cyclone which followed the path of 11 degrees and 21 degrees within the cyclone path. In the traditional lunar calendar, hurricane season falls in November to April. December to February is often referred to as 'warm season' called *vula i katakata*. People would not be sailing to the neighboring islands during this period, but rather prepare themselves for cyclone events. This is also known for as the breeding season for land crabs and insects. However, due to climate changes, the weather patterns are changing.

Fiji is currently conducting cultural mapping in the Institute of iTaukei Language and Culture under

1 iTaukei Institute of Language and Culture, Fiji



the Ministry of iTaukei Affairs which began in 1974. The institute was then named Fijian Dictionary Project unit funded by Mr Raymond Burr, an American actor and focuses on compiling a Fijian monolingual dictionary. In completion of that project, through the approval of the cabinet in 2004, the new name of Institute of Language and Culture was provided to the department to undertake cultural mapping in the 14 provinces of Fiji. The institute has completed cultural mapping in the 13 provinces and currently commencing this work in the final province.

Fiji ratified the 2003 Convention in 2010. The institute had set up a special revival unit, tasked with facilitating revival workshop of Traditional Knowledge & Cultural Expression through the transmission of knowledge, know-how related to cultural expressions.

These are just a few of our traditional indicators in the olden days till today. Our traditional indicators on the left-hand side, are fruits bearing before a cyclone approaches, this is normal in Fiji. If it is bearing more than the usual number of fruits that means a cyclone is approaching.

Last week I took this picture of a bee hive. It indicates cyclone according to traditional knowledge of the iTaukei. Normally bee hives are situated on top of the trees but when it's at ground level that means a cyclone or a hurricane is approaching.

Another indicator according to traditional knowledge is seashells. Normally this type of seashell is easy to gather while diving in the ocean. But when a cyclone is approaching, the seashells are firmly attached to corals and rocks at the bottom of the seabed. When divers experience this, they become aware of a neighing cyclone.

Before Cyclone Winston last year, category 5, there were more than thousands of dead fish washed up ashore on the coral coast of Fiji. This is due to the change in sea temperature and the elders know that a hurricane or a cyclone is approaching.

ITAUKEI TRADITIONAL KNOWLEDGE IN RELATION TO DISASTERS

INDICATORS

- PRE-CYCLONE

❖ BREADFRUIT [bearing more than usual number of fruits]

❖ BEEHIVES

CONT.

SEA SHELLS AT DEPTH

DEAD FISH [sea temperature change]

DURING DISASTERS – Earthquakes, Tsunami, Cyclones & Floods;

Pre-western practices:

- FOOD PREPARATION TECHNIQUES
- SOLESOLEVAKI [Traditional communal collaboration]
- Caves used for shelter during hurricanes/ cyclones
- IN CASES OF FLOODING – Swift currents in the village]
- TRADITIONAL MEDICINE [in cases of accident, injuries with limited resources available]

The connection between Mother Nature and animals are quite similar across culture even here in Japan, prior to earthquake, tsunamis, animals have a peculiar sense of knowing the unforeseen natural disaster.

Last December, a tropical depression was experienced in Fiji which causes flooding in low-lying areas. For people living in the low-lying areas, when the flood turns into dark-colored muddy waters, that indicates that more flooding will occur in the next few days.

During disasters, a traditional communal collaboration known as *solesolevaki* allows everyone to participate in the securing of the villagers. The elderly and the mothers are escorted to the safe areas. In some villages, caves are used for shelter during hurricanes. Traditional medicines as indicated in the picture, are used to address any injury sustain during the disaster. Communications during the natural disasters are often limited since all communication terminals are down.

After the cyclone, when breadfruits are plentiful, a pit is dag, and all fallen breadfruits are stored in it as a preservation method preparing them for the aftermath of cyclone.

Similarly, people resort to other traditional activities such as the use of traditional medicines, healing practices, fishing methods and agricultural farming for sustainable livelihood in their community.

Cyclone-resilient ICH: The traditional architecture of *bure* in the village of Navala, highlands of Fiji has been recognised as a natural resilient zone. During Cyclone Winston, the villagers were not stirred but rather they enjoyed the scenery. The roofs made of leaves were been blown away yet there was not any major injury to the community members.

There are also flood resilient mechanisms that the people used. Villages have ring ditches build around their village which serves as a countermeasure during tribal wars, preventing enemies from reaching the village, the other purpose of the ring ditch is to prevent flooding. Now the communities have migrated from their ancestral village to a new location, often they choose to live along a river or stream. In the case of Navala village, the ring ditch is called *korowaiwai*.

These are some of our pre-colonial indigenous knowledge and beliefs. We normally believe in the silence and the elements. During Cyclone Winston last year, the indigenous community, iTaukei, have inner belief that people can survive cyclones; the will to survive during natural disasters. iTaukei have their own traditional beliefs on natural disasters and these are mainly from past experiences of their forefathers. However, the question remains, why Winston did a lot of damage? iTaukei have their own traditional beliefs, but still families suffered during this disaster. Pre-Westernisation, before the 1700s, as already mentioned regarding cultural mapping, *lali* (wooden drum) are beaten and conch cells are blown to counter or warn tsunamis. These are the traditional approach in the olden days when tsunami is approaching. Conch shells are blown or *lalis* are beaten. However, these approaches are not practised anymore. iTaukei have got many strategies in Fiji pre-1700s that are transmitted down from one generation to the next.

iTaukei have got their own challenges, in which at present, it is reconnecting the local people with their traditional knowledge. The older generations of today no longer care about the traditional knowledge in Fiji.

We need more awareness and appreciation, and also the insufficient research on ICH and their connections with the DRM. Some other weaknesses are the national and regional stakeholder's capacity and partnerships, inadequate technical expertise and capacity, and the geographical distance to remote communities. I think that is all of my presentations. Thank you very much. *Vinaka*.

BLUE SHIELD PASIFIKA AND ICH SAFEGUARDING IN FIJI

Elizabeth F. D. Edwards[1]

Today I am going to be talking about Blue Shield Pasifika. I know you must be asking what is Blue Shield Pasifika; short form for it is BSP. You have Blue Shield Australia, you have Blue Shield USA and this is a newly formed organisation. It's an NGO and as you can see we've got that term Pasifika. So it's regional, it's not only for Fiji.

These are the contributing institutions that have contributed towards the Blue Shield Pasifika. It's newly established; we just established last year in April, Dr Masuda was present. Our partners are E-Commerce Pasifika, PIMA, Fiji Museum PURBICA, PIALA, UNESCO which is the actual founder that initiated Blue Shield Pasifika and UNISDR.

Our mission is working to protect the world's cultural heritage from human-induced disasters and

1 Blue Shield Pasifika, Fiji

natural disasters, as you can see on the brochures there. This is the brochure that I created and that's one of the first national heritage site declared by UNESCO that's the Levuka Heritage Site, that's one of them. The second one was the one Dr Masuda was actually commenting on Navala, soon after that we've only got Levuka at the moment.

With my presentation I will be talking a bit about Blue Shield and then interacting with Cyclone Winston; the cyclone that impacted Fiji and till today it's almost a year; we still have families, students, schools that are in tents, as you can see there. Cyclone Winston was a category 5 cyclone. When it came on the news the people thought, oh, it's just category 5. For our community that are back in the villages, they thought, oh, it's just a normal cyclone, not understanding the fact of the categories, that it's 1, 2, 3 or 4, 5.

That's Levuka, that's one of the heritage sites again. This is the Levuka School, as you can see the UNICEF tents, you see in the background there. It was actually scorched, all leaves, everything, totally devastated. Honestly speaking, I have never seen a cyclone at this extent and these are all people back at home in the tents.

What is Blue Shield Pasifika? BSP is a Pacific branch of Blue Shield. It is a coalition of international nongovernmental organisations; NGOs that engaged in Disaster Risk Reduction, DRR, activities to protect culture heritage and institutions from risks associated with natural and human-induced disasters.

Today, we only have two members on the team, that's we have one of my colleagues. She was actually invited to this meeting, Mere Ratunabuabua. I am sorry to say she had to be in Canberra and I am actually at the Secretariat.

These are the activities. UNESCO normally gives us the task and then we execute. We launched BSP in April last year. At the national archives, we have established a Blue Shield Pasifika

guideline. We did our first awareness through Facebook because it was free. We currently have 1001 members. I did presentation at the IUCN World Congress for youth in Hawaii in September last year. We've created a Blue Shield brochure as you can see and the next we were tasked to do an exhibition at the Fiji Museum. So, this is the way we are incorporating it.

With natural disasters, it's a new thing for us back at home. It's not something that we get daily but on that scale of the Winston, we were given this task, live to tell, to interview the community, for them to tell the story. So they said, okay, Lizzie, you've got to do DVDs; I said, oh, I don't, where is the budget. There is no budget; so we actually brought in partners. We've invited partners.

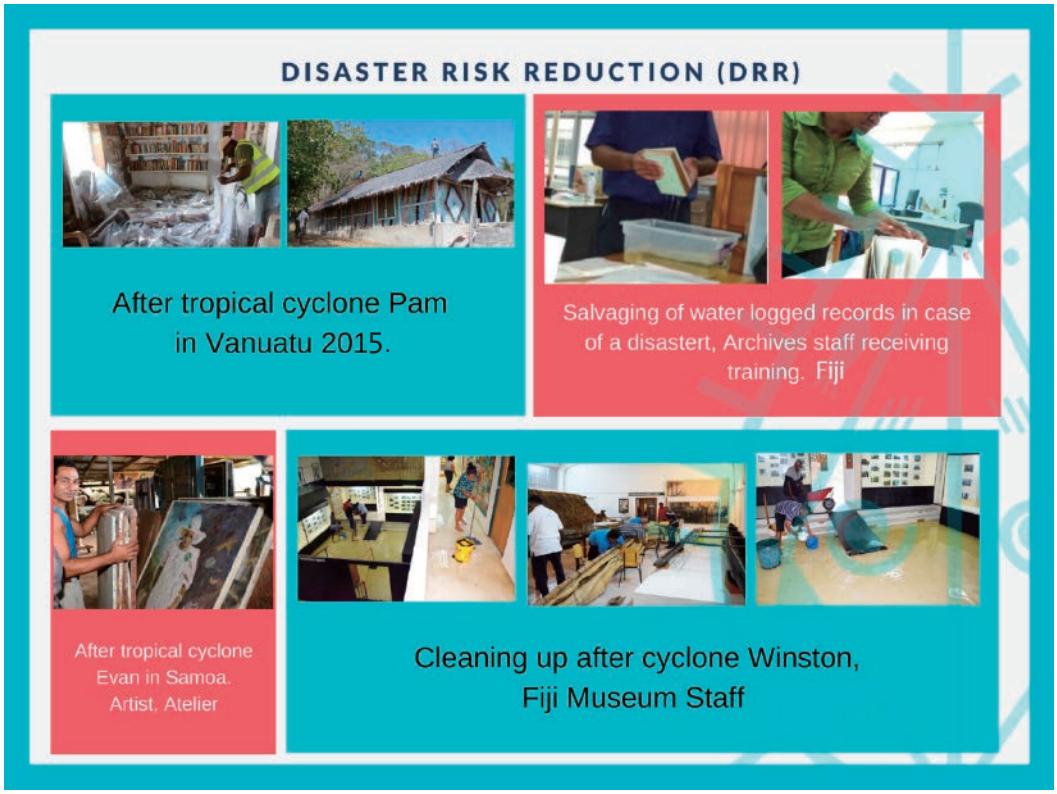
What I've normally suggested to the government bodies is to integrate the public sector with the private sector and merge them together. We did our research and we found under the DMO Department that straight after Winston they had all the stakeholders there on the websites. We had no funding, so we drafted out a letter. We sent it to them and then we asked them if they can exhibit at the Museum. They already have the materials. So we bought them in all at the Fiji Museum under one roof; it was like history. It has never been done; so we had the private sector, we had the government sector, we had the embassies that even funded it.

So, basically disasters impact everyone across the globe, across all sectors and the universities. We also collated responses for my survey questionnaire and this was sent out to national and regional agencies on the status of DRR in their sectors. GLAM, that's looking after the galleries, libraries, archives and museums. So we sent them out to PIAL PURBICA, PIMA, ICOMOS Pasifika, regional organisations and networks, even the USP library. Our University of the South Pacific is a regional University where we have students from all the South Pacific countries and individual organisations. We also had our challenges in receiving responses. We managed to establish a database for existing and not well-known organisations, part of it was most of them said oh! okay, what's Blue Shield Pasifika? So, we had a workshop. As you can see the participants present there were directors of the museums, archives, libraries, all throughout the Pacific. We even had lawyers, from the States. This is Dr Stone, UK Blue Shield; Dr Akatsuki (Takahashi) who is also like my boss and all the Pacific regional participants. I think Richard, that's your boss there.

Concerning the current status of disaster risk reduction in BSP institutions, our findings are: not all institutions has had OHS training; most of these institutions have no backup plan in place for their data, meaning all the information that's in your museum, your library, your archives. I ask them, do you have a backup in place, if a tsunami strikes your building where will that information be, and most of them say, it's all in that building in another room, but they never thought of that to take it off-site. Some tell us there is lack of funding, limited human resources to manage DRR, no plans are in place in case of a disaster, limited knowledge on DRR in their institutions.

This is the BSP brochure; our mission is to empower small island developing states in DRR on cultural heritage and institutions, and to promote the 1954 Hague Convention under UNESCO. Our three main objectives are to share good practices in DRR for cultural heritage and institutions, GLAM, in Pacific small island developing states promoted by NGOs in the Pacific; to gain a better understanding on the role of Blue Shield within the framework of the 1954 Hague Convention and it's two protocols which is also natural disasters. It's lined up from 2015 to 2030 and the third bit is to support capacity building activities.

As you can see in the brochure that's after the Cyclone Pam in 2015 with our national archives; it's never been hit by any terrible disaster. So the staff was normally put into trainings in case they do have something but fresh off the shelf last week they got robbed; so that's an incident. These are the artists after Cyclone Evan in Samoa and this is at the Fiji Museum. Flooding in the gallery spaces. Sometimes it's just the lack of funding to repair.



These are our action plans. Priority one is to understand disaster risk. Priority two, strengthening disaster risk governance to manage disaster risk. Priority three, investing in disaster risk reduction for resilience. Priority four, enhancing disaster preparedness and effective response to build back better in recovery, rehabilitation and reconstruction.

I'd like to speak a bit about the exhibition. It was opened by Mr Timothy Wilcox. So this is how we engaged the community, boarding the stakeholders, never been done but it's possible, it can be done. We share that with our regional counterparts. They could also implement. This is how we did our awareness. We engaged the artists. This group performed an item stronger than Winston and this is part of the displays that were done. This is Save the Children, this is an institution that looks after children. Psychologically, the children were impacted too and still recovering. UNISDR, and those are the DVDs that playing in the background there.

ICH and DRM in Fiji. Today also, I have a background from the media, television production site. So, we have recorded Living Human Treasures documented at the Fiji Museum. We have bought in Fiji's top Living Human Treasures with the knowledge on the culture sector and also ICH which is totally unique in their caliber. Secondly, we are raising awareness to the younger generation on the traditional knowledge on science of disaster in nature. Third bit is the information should be communicated through DVDs. I think that's a platform that most of us should be looking at and incorporating that to move with the 21st century. Most of our information are either in pamphlets or brochures. But then if you look at the day and age and time you have the telephone technology, you have got DVDs and I also strongly believe that the information, like my colleague stated earlier that the rural people know and you have the urban. I think these two information should be documented and circulated vice-versa and it can be distributed through schools at secondary level, primary level or even taking up to the ministry levels.

The signs of disaster is stated earlier the bearing of excessing fruits, birds, even the fish having

their hearts black, the bees and the sky. Regional ICH priorities, firstly sharing and exchange of information secondly value and revival of traditional house building, boat building skills and seafaring skills. That is the two components that I would like to highlight at this meeting. As stated earlier, most of our communities back at home are still intense and most are waiting for handouts from the government to come and provide. Whereas not everybody had their – whether it's their natural habitat, scorched out or it's still available but it's just a knowhow, most of them don't know how to do it. And I think that information needs to be disseminated back to them on how they can build back their own homes.

ICH safeguarding, storage of ICH recorded data for backup, skills and knowledge, transmission, raw materials must be grown, cyclone proof, for example the sago plant in Dakunikoro Village is becoming extinct. So, I think with SPC they have gone into taking this plant and planting it in another village. Traditional *bure* builders, house builders are in high demand now, families and schools are still housed in tents. The habitat for humanity, it's a building NGO with DISMAC. This is the NDMO Government Office that looks after our citizens in times of disaster. Fiji Museum, these are the multi-partners, knowledge and awareness, linked to the prototype linking up to the agriculture sectors with cultural knowledge for cultural post-disaster needs analysis results. Supply of funds to replant certain types of woods, like the *vesi*, *dakua*, *voivoi* or the sago. The collection of data on all of the above.

These are some of the pictures of what's actually happening now on the ground back at home. Students are having their classes out there. This is the family and those that have lost their homes are still in the tents.

Just an example on the Fiji background statistics. As you can see on this chart here, shelter is the fourth priority, that's why we are emphasising on traditional home building and this is a rough estimate on the 38.6 billion. This is a PDNA after Cyclone Winston. It also has stats on the ICH.

Impacts




Activities on ICH at the Fiji Museum



A study of ICH safeguarding, a study on each step, SPC data research on Vanuatu and they found that the impacts of disasters not only affected ICH but also the resource materials, regeneration communications between all sectors. Surveys must be done well before disaster and the ICH traditional practices. Fiji and the South Pacific need to have a baseline research information. Right now, we don't have that.

These are some of the practices that are still happening at the Fiji Museum. The pottery makers, *manimani* weavers, the fire walkers and we invite the students and the public at large to attend and to keep it alive instead of just having it there back in the villages. We bring it to the museum because apart from the artifacts these are the living human treasures too.

Our strengths are the partners and the networks that we already have in place. Our challenges are raising awareness and communications. In our action plan, we are trying to develop more informative DVDs for the public at large and use it as a training tool. *Vinaka vakalevu*. Thank you.

ICH AND DISASTER RISK MANAGEMENT IN THE REPUBLIC OF VANUATU

Richard J. Shing[1]

Good afternoon. Before I start, I would like to say my presentation would be more general and broader. I have my other colleague, Meredith Wilson, who will be doing a case study on a more specific case study on her presentation.

Though ICH is a prominent and is an important part of everyday life in Vanuatu, the work to preserve, promote and protect ICH is still in its infancy.

The National Laws on Legislation dealing with ICH: The Vanuatu National Cultural Council or VNCC Act is an act to provide for the establishment, for the preservation, protection and development of various aspects of the rich cultural heritage of Vanuatu and for provision of public libraries. The objects of the council that are relevant to ICH and that I quote from the VNCC Act One is to support, encourage and to make provision of the preservation, protection and development of various aspects of cultural heritage in Vanuatu. Two, to support, encourage and make provision for the establishment, maintenance and development of public libraries. Three, to establish, maintain, administer and make provision for such national institutions as the council shall consider necessary and appropriate for the purpose of these objects, including but not limited to the following national institutions; the Vanuatu Cultural Centre, including the National Museum, the National Library, the National Film and Sound Unit, the Vanuatu National Heritage Register and the National Archives. Four, to initiate, encourage and support all services, matters or things that are conducive towards the proper and orderly development of any national institution set up in accordance with this act. Five, to initiate, encourage, support and conduct research and training programmes on any matters relating to any national institution set up in accordance to this act. Six, to foster cooperation in matters related to the provision of museums, libraries and international relations between the council, governments, organisations and bodies interested

1 Vanuatu Cultural Centre

Heritage Conventions

- Vanuatu ratified the World Heritage Convention on 13 June 2002
- Vanuatu became a signatory to the Convention for the Safeguarding of Intangible Cultural Heritage in 2002
- Inscription of Vanuatu's Sandroing on the Representative List of Intangible Heritage, 2003
- Chief Roi Mata's Domain was inscribed on the World Heritage List in July 2008

***Above**: A sandroing; **below left**: Mangaas (Roi Mata's residence); **below centre**: Excavation on Artok of Roi Mata's burial; **below right**: Rockart in Fels Cave (where Roi Mata drew his last breath)*

therein. In addition, Vanuatu has the Archive Act; the Book Deposit Act, the Preservation of Sites and Artifacts Act to assist in the preservation, protection and promotion of cultural heritage.

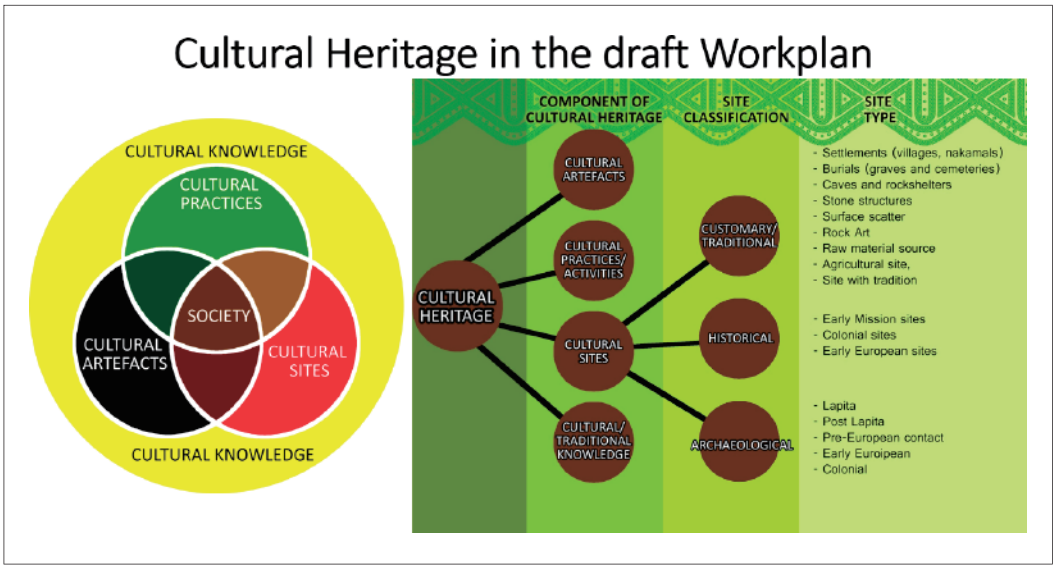
Despite the legislations already in place there still is a lot of need to improve and implement the national legislature for the protection of World Heritage sites since Vanuatu does not have any specific legislation that protects World Heritage sites. The site of the Chief Roi Mata's Domain which is Vanuatu's first and only World Heritage site, are currently protected under the Vanuatu's Protection of Sites and Artifacts Act but there are specific needs that need to be addressed regarding World Heritage in Vanuatu.

There is also a need to develop a legislation that gives recognition to and protect Vanuatu's intangible cultural heritage.

Heritage Conventions: The Republic of Vanuatu signed the World Heritage Convention in 2003 and shortly thereafter the Vanuatu Cultural Centre in consultation with the Environment Unit worked to develop a tentative list of sites for future nomination and presented the list in 2005. Chief Roi Mata's Domain was inscribed on the World Heritage List in 2008 and is our country's only world heritage site.

A nomination is currently being prepared under the auspices of the Environment Unit for Lake Letas. Lake Letas is the largest lake in Vanuatu. It is a crater lake on the volcanic island of Gaua in the Banks Islands of Northern Vanuatu. Vanuatu became the signatory to the 2003 Convention in 2002 and Vanuatu sand drawings were proclaimed in 2003 and inscribed on the representative list of the Intangible Cultural Heritage of Humanities in 2008.

Vanuatu's first and only World Heritage site is the Chief Roi Mata's Domain and the site is located about 20 minutes' drive north of Port Villa in the area of Havannah Harbour and is a cultural landscape consisting of three sites; Mangaas, Fels Cave, and Artok. These three sites of the Chief Roi Mata's Domain represent the life and death of the last holder of the Roi Mata chiefly line title who died around the around 1650 A.D.



The site of Chief Roi Mata's Domain has provided us with an opportunity to reflect on the threats, both cultural and natural, to the cultural property of our nation and is managed entirely by the traditional landowners and custodians of the area.

Cultural Heritage in the Draft Corporate Plan: The Vanuatu Cultural Centre is in the process of drafting its next corporate plan for the next 5 years and its first yearly business plan. It gives us the opportunity to rethink our role and make plans on how we want to manage cultural heritage in the years to come. It is the first time that the managers of the different sections under the Vanuatu Cultural Centre are being part of putting this plan together with the vision of the institution as a whole.

In the Vanuatu Cultural Centre, cultural heritage is divided into four components. Due to the lack of adequate human resource, the institution is attempting to define cultural heritage in this manner, which I have on the slide above; that aligns its various components with the various roles of the different sections that make up the Vanuatu Cultural Centre to ensure that all current sections assist and have a role to play in the protection, preservation and promotion of cultural heritage in Vanuatu. Four components are the cultural practices, cultural sites, cultural artifacts and cultural knowledge and inside all of this is the society.

Cultural artifacts are anything created by humans which give information about the culture or its creators and the uses are significant because they offer an insight into the technological processes and economic development and/or social structure, livelihood and well-being of the people who created and used them.

Cultural artifacts are tangible and movable and include, but not limited to, tools, for example tools for gardening, fishing, cooking and cleaning, etc., ornaments, for example shell bracelets, earrings, pendants, necklaces, headdresses, etc., and instruments, for example flutes, drums, ankle rattles, etc., ceremonial objects, for example *tamtams* in funerary effigies, etc., weapons, for example club, spears and slings, etc., and traditional attire.

Cultural activities are performances, actions, practices and activities that are connected to the culture of a society. They are social, artistic or ceremonial pursuits considered to be valuable, enlightening and/or beneficial to the people living in a society and are related to their habits, beliefs, traditions and life ways.

They are visible when performed and include, but not limited to, activities and practices associated with gardening, for example food production and preparation, traditional medical practices, traditional games, traditional rituals and ceremonies, for example weddings, custom dances grade taking ceremonies, etc., infrastructural construction, fishing, traditional music, carving, art, song and chants, creating traditional clothing and ornament making.

Much of our cultural heritage, our cultural activities are big succumbed to external influences and change over time. There is, therefore, an urgent need to preserve, protect and promote the utilization of these practices.

Our cultural sites are the immovable places within the terrestrial and marine environment that is of cultural, historical and/or archaeological significance or value. The size of a cultural site may vary from the size of a small area surrounding stone to the size of the island itself and may sometimes contain artifacts and physical evidence of past events, activities and practices.

Cultural knowledge is translated as being the information, intelligence, ideas, wisdom, skills, awareness, understanding, manners, beliefs and practices that are developed, sustained and passed on from generation to generation within a society often forming part of its cultural and spiritual identity. Cultural knowledge includes types of knowledge about traditional technologies of subsistence, for example, tools and techniques for agriculture and hunting, ethnobotany, ecological knowledge, traditional medicine, celestial navigation, weather and climate.

These kinds of knowledge are crucial for the subsistence and survival and are generally based on the accumulation of empirical information on interactions with the environment. In tradition of Vanuatu's societies, knowledge is passed orally from generation to generation, from person to person and finds expressions in the form of stories, legends, folklore, rituals, songs and laws.

Cultural or traditional knowledge is essential element of all three components of cultural heritage, artifacts, activities and sites and also is a very essential component of society as a whole.

Potential Natural and Man-Made Threats to Cultural Property: According to the 2015 World Risk Report, which I found on the internet, Vanuatu is the riskiest place in the world to live.

Vanuatu straddles a particular difficult series of environmental hazard zones, being exposed both to high levels of volcanic and seismic activity as part of the Pacific Ring of Fire and to frequent tropical cyclone activity. The global challenge of sea level rise also takes on a particular significance in this oceanic environment. When preparing a risk and management plan for cultural property in Vanuatu, we need to consider as a priority the impacts of – and I read them in order of frequency; tropical cyclones, earthquakes, flooding, volcanic eruptions and activity, El Nino effects, global warming and sea level rise.

With regard to the theme of this conference, Vanuatu has experienced a land sale boom which is in large tracts of the customary land sold to foreign investors. The separation of land and people at the time of colonisation and now more recently through land sales represents the biggest threat to cultural heritage in Vanuatu because it severed people's connections to their *kastom* or traditional places. It severed the connection between the tangible and intangible heritage of our people. We are being in danger of losing our intangible cultural heritage if the tangible land and the tangible resources that are around them are lost. The Ministry of Lands is currently working hard to address this issue through new land reforms but we still have a long road ahead in relation to this issue. The site of Chief Roi Mata's Domain has undergone numerous land use planning workshops to address the issue of land sales seeing Lelema World Heritage Committee working exceedingly hard to educate the community about the impacts of land sales on cultural heritage.

The Vanuatu Cultural Centre does not have a complete Disaster Risk Reduction Plan, though some projects and initiatives may be seen as a risk reduction before, during and after the disaster.

The slow food initiative and the safeguarding of indigenous vernacular architecture and building knowledge in Vanuatu are two projects aimed at promoting traditional food and architecture to areas where the use of ICH is important to the survival of the community in times of disaster. It is, however, essential that the Vanuatu Cultural Centre oversees the protection of cultural property in Vanuatu, invest in the development of disaster risk reduction plans to protect the tangible and intangible cultural heritage within its territory.

Of all the disasters in Vanuatu, cyclones are the most frequent and destructive. After the cyclone, as we saw after the category 5 Cyclone Pam, people's main concerns were about housing and food. The majority of people living in Vanuatu heavily rely on food. They produce for the daily sustenance.

The indigenous knowledge on where and how certain food are grown and how they can be processed for preservation are important in times of disaster. For example, in Vanuatu some local food damaged during cyclones can be dried or fermented to preserve it for months or years. The breadfruit, as my colleague, two of our friends have discussed, is one type of food that people can dry and ferment and store for long periods. In addition, there are many plants that people normally do not eat but do so in times of disaster and food shortage. One example I have put up there in the picture is that in the bark of the black palm.

More than half of the people living in Vanuatu cannot afford cyclone-proof cement houses but our ancestors have been living in this cycle prone environment for 3000 years and have invented certain ways of building traditional houses, using materials available to them in the surrounding environment which possess the capacity to withstand strong winds and earthquakes.

During Cyclone Pam many of these locally built *nakamals* or large meeting houses served as storm shelters. Different islands have different ways of building indigenous houses using different materials but one common feature that makes them cyclone and earthquake resistant is the fact that all of them are built with the roof log and embedded into the ground.

The problem we have faced today is many people build their traditional houses with high walls, a feature that was introduced by the early missionaries in the late 1800s to allow for more room

Objectives of the Vanuatu Cultural Centre in relation to the protection of intangible cultural heritage

- DRR Plan for Chief Roi Mata's Domain and Fels Cave
- Improving and implementing national legal protection for World Heritage sites
- Cultural Mapping of the association between the tangible and intangible heritage of traditional food practices and traditional architecture
- Fieldworker workshop on disasters and *kastom*
- Survey of fieldworkers (intangible cultural heritage)
- Festivals. Culture and Arts Festival 2018

Inside the Taloa nakamal on Nguna island

space. This type of housing is not cyclone resistant and has led to the loss of knowledge of building low roof traditional houses in some of the islands, especially in the urban areas.

The Objective of the Vanuatu Cultural Centre in Relation to Protection and Promotion of ICH and DRR: The Vanuatu Cultural Centre's immediate goals for ICH in relation to DRR are, one, to undertake cultural mapping with the assistance of the Vanuatu Cultural Centre field workers on intangible cultural heritage which would provide us with the information on ICH in different regions of Vanuatu, identify intangible cultural heritage that are under threat, record and document *kastom* knowledge associated with disaster preparedness and survival, for example food preparation. Two, develop and implement national legal protection and recognition of ICH for World Heritage sites. Vanuatu does not have any legislation specific to World Heritage sites and also to include more legislation on ICH. And three, to produce materials, written, audio and audiovisual, and organise activities, events and festivals aimed at promoting the role and importance of ICH and DRR. Four, prepare Disaster Risk Reduction Plan for World Heritage property of Roi Mata's Domain based upon how ICH can be utilized to reduce risk. And five, organise and support projects that actively promote the connection between the tangible and intangible cultural heritage of traditional food practices and traditional architecture.

The Vanuatu Cultural Centre will continue to support work on the transmission, revival or promotion of its ICH and this concludes my talk.

To conclude, I would like to thank Dr Shaw. One thing I wanted to get from this meeting here is a way forward for our country. We are very – a bit back in the policymaking and what all of you have been presenting today, you are well advanced in what we are doing as an institution and what I learned a lot from this morning's discussion is a way forward. And I will use a lot of examples which Dr Shaw presented and I am sure after this meeting I will have a lot more to contribute to ICH in our country and disaster risk reduction.

ENHANCING TRADITIONAL MECHANISMS OF ICH TRANSMISSION AT CHIEF ROI MATA'S DOMAIN, VANUATU

Meredith L. Wilson[1]

Firstly, I would like to acknowledge that some of the ideas that I will be presenting in this paper emerged during a recent trip to Vanuatu with Yoko Nojima from IRCI, and I would also like to thank IRCI for inviting me today to present on the intersection of these ideas of ICH safeguarding and disaster risk management.

My husband, Christopher Ballard, and I have been working at Chief Roi Mata's Domain, Vanuatu's first World Heritage Site, since 2004, initially with the landowning community and the Vanuatu National Museum and Cultural Centre to prepare the nomination document for the property which was inscribed in 2008, and thereafter as part of a growing international advocacy group to build and strengthen the management and tourism activities of the site. So, this paper really emerges from a long history of discussion between myself and the landowning community, and particularly the property management committee that is pictured in the slide, and colleagues at the Vanuatu National Museum and Cultural Centre.

Chief Roi Mata's Domain is the former territory or domain of a famous Paramount Chief, as Richard talked about, who held the title Roi Mata and who died in about 1600 CE. Legends of the life and deeds of Roi Mata are told throughout Central Vanuatu, although these legends almost certainly refer to the lives and activities of several different holders of this title.

It's the very last Roi Mata who appears to have been an exceptional individual responsible for settling a long period of widespread conflict in the mid-16th century and for establishing *Naflak* which are basically group totems that continued to structure marriage patterns and connections to land in Vanuatu. The property is demarcated by the dark gray area on the map to the right and consists of the three sites: Mangaas on the mainland of Efate, Fels Cave on the Island of Lelepa and then on the left-hand side Artok Island, or Hat Island as it's also referred to, which is separated by Havannah Harbour.

Figure 1

The Lelema World Heritage Committee (LWHC) that manages Chief Roi Mata's Domain

1 Stepwise Heritage and Tourism Pty. Ltd., Australia

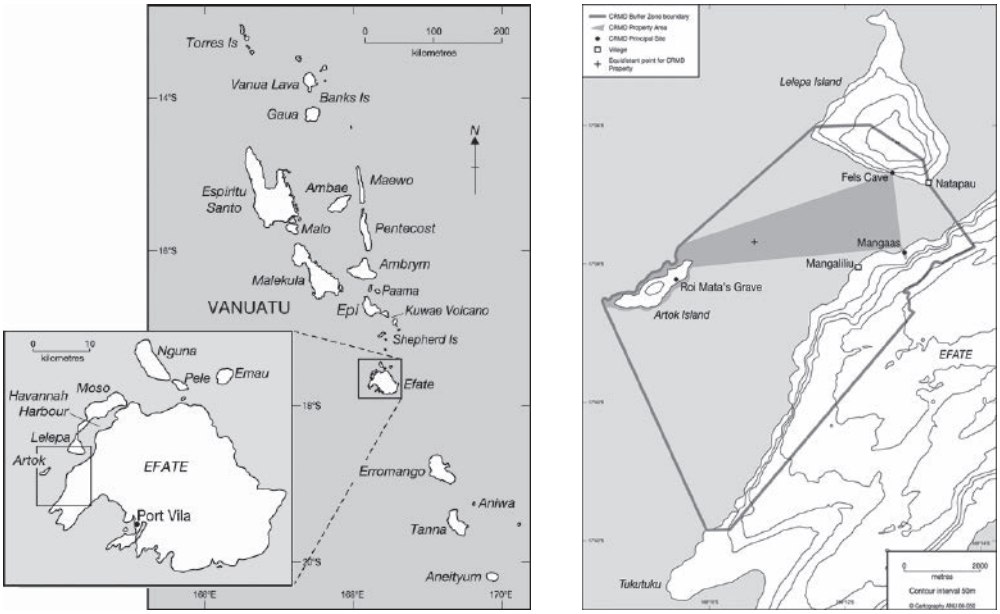


Figure 2 The location of Chief Roi Mata's Domain, Vanuatu

So, resident at Mangaas on the main island of Efate and Central Vanuatu, this last Roi Mata is said to have died as an old man in Fels Cave on neighboring Lelepa Island. His residence at Mangaas was abandoned, never to be resettled again and his body was transported to the small island of Artok, whose residents were displaced so that the entire island could be declared taboo or *fenua tapu*. There, Roi Mata was reputedly buried in a ceremony that saw as many as 300 people buried alive to accompany him in death. Excavations at the site in the 1960s by the French archaeologist, Jose Garanger, uncovered an extensive cemetery that confirmed the story of Roi Mata and the presence of the largest-known sacrificial burial site in the Pacific.

There are two concepts that are important for understanding Chief Roi Mata's Domain and the history of management at the site. The first concept is integral to the Lelema Community that lives in the Buffer Zone around the site and which looks after and tells the stories of Chief Roi Mata's Domain. *Nafsan natoon* translates as the 'talk that is'; it's like a local law. It's a natural way of being in the landscape. This concept lies at the heart of all intangible cultural heritage that authenticates Chief Roi Mata's Domain; the stories that give meaning to the sites and the social and cultural codes that dictate how people behave in relation to the sites of Chief Roi Mata's Domain. For instance, it is inappropriate for people to call out the name of Chief Roi Mata on the Island of Artok, particularly close to the grave site, due to a belief that the sea surrounding the island will become rough and impassable by boat, stranding them on the island until they make an offering on the grave.

The second concept is a modern framework that has been developed over time to explain the community's approach to managing Chief Roi Mata's Domain as a cultural landscape and a World Heritage Site. In pigeon, this framework is referred to as a 'trifala' leg, basically a three-legged stool, as it has three components: people, place and story. It's the places which are the sites within the property; the people, the landowners and chiefs and residents who look after the site and the people for whom the site has meaning; and the stories about Chief Roi Mata and the landscape. While World Heritage inscription involves the registration of physical properties, the category of the cultural landscape recognises that the stories and the beliefs of the community are essential to the outstanding universal value of the site. The Management Plan of Chief Roi Mata's Domain takes each of these three factors into account for they are interdependent and

Figure 3 Left: Mangaas immediately after the Cyclone; Right: Mangaas after the rehabilitation of the site

critical to the overall value of the property. If one leg of the stool is threatened or damaged, the stool topples over. However, when the nomination dossier for Chief Roi Mata's Domain (CRMD) was being conceived, its classification as a potential World Heritage property led to the development of a monitoring programme that actively measures changes to the physical components of the property, for the place essentially.

Seismic impacts, for instance, were considered in relation to their potential impact on the rock art and the structure of Fels Cave on Lelepa Island and monitoring points were established accordingly, and we set up similar monitoring points on Artok Island. However, while the Management Plan for Chief Roi Mata's Domain promotes the revitalisation of storytelling associated with the Roi Mata site, specific indicators for measuring the rate or quality of the transmission of the stories or knowledge, the intangible elements of the site, within the community have only recently started to be articulated and piloted.

Cyclone Pam, a category 5 cyclone, struck Vanuatu on 13 March 2015. While the cyclone did surprisingly little structural damage to the material sites of the CRMD, it severely damaged homes, gardens and livelihoods. This slide shows before and after shots of the rehabilitation of the sites which were undertaken over a period of a week with funding from UNESCO, and you can see that we were able to make significant changes to the site within that short timeframe.

The event brought into sharp focus that without security for the health and livelihoods of the community, the stories and thus the meaning of the cultural landscape of Chief Roi Mata's domain are profoundly threatened. When a natural disaster strikes the cultural landscape, that natural disaster becomes a cultural disaster relevant to the people who have been devastated by its effects and who give meaning to its impact.

Our understanding of the relationship between disasters and cultural heritage of Chief Roi Mata's Domain has evolved over time. So, in 2002, prior to the nomination project, an earthquake struck close to Efate that caused significant damage to the entrance of the rock art site of Fels Cave where Chief Roi Mata drew his last breath. This event emphasised the material threats to the property and our need to address them.

By 2004, and Richard talked a little bit about this, we were confronted with a much larger threat of widespread land sales to foreign investors, essentially a human induced disaster. While this threat awoke us to the idea of the community's well-being, we were still thinking at that time like archaeologists, and were concerned about the sites, the site access and site ownership. We were acutely aware of the threat posed by, and Richard talked about this, the splitting of the tangible heritage (the place) and the intangible (the people in the stories) as a result of land sale.

But what the cyclone of 2015 made us realise is that while the impacts to the sites were superficial, the cyclone posed a significant threat to the community's well-being and therefore the site's values. After an assessment of the impacts of the cyclone to the people, places and stories of CRMD, the main finding was the need to develop a Disaster Risk Management Plan that placed the community and its well-being at the heart of future disaster planning for the property.

The recent mission to Vanuatu by IRCI at the end of last year provided us with a brief opportunity to return to the community concept of *nafsan natoon* in the context of disasters and to use this as one of the founding principles for eventually developing a disaster risk management plan for the site. An afternoon meeting on the beach at Mangaas with the managers of the site allowed us to undertake a preliminary study of how indigenous knowledge and intangible cultural heritage informs disaster risk management at Chief Roi Mata's Domain.

The workshop focused on the use of indigenous knowledge in relation to four different types of disasters; cyclones, earthquakes, fire and coastal water inundation as a result of tsunamis and sea level change. As time was limited, to guide a discussion, we asked the community to frame their responses in relation to the Disaster Risk Management Cycle to obtain a sense of what people do before, during and after a disaster. We didn't address the issue of community vulnerability because the session was too short. So, we specifically addressed the hazards themselves. So to look just very briefly at the *langwot* (which is the cyclone) and the indigenous knowledge that was used in preparation for the cyclone.

In the months leading up to a cyclone, people prepare their grass houses; they construct them; they repair them. There is seasonal planting of particular types of crops (one of these is called *nalo*, which is a yam, and it's a cyclone resistant crop) and people look out for environmental indicators of a cyclone. So, for example, this particular slide shows my colleague Richard Matanik, who is Chair of the World Heritage Committee, drawing in the sand to demonstrate the location of the sun in relation to a site called *napsinfor*, which is a casuarina that sits on the top of Hat Island, and if the sun exceeds the line of *napsinfor* then that is an indication to the community of an impending cyclone.

In the event that a cyclone is imminent, gardens are prepared to reduce damage. Wild cane is used to secure yams in the ground. Manioc (cassava) is cut low to the ground. Food is harvested and stored for post cyclone use. In Lelepa, they have a particular technique called *namru* which involves the hanging of food in the houses for consumption after a cyclone and, as others have talked about, in Fiji and throughout Vanuatu people used fermenting techniques to store food in underground silos. The health and well-being of members of the Lelepa Community after Cyclone Pam can be directly linked to the extent to which they embraced these historically-adapted techniques of preparing for cyclones.

The site managers at CRMD, after our short discussion, felt that to 'build back better' they need to focus particularly on strengthening the transmission of indigenous knowledge associated with food security and cyclone resistant shelter construction. In terms of the future safeguarding of intangible cultural heritage in the Pacific, what can we realistically achieve at the grassroots level or at the level of government policy to: prevent the loss or damage of intangible cultural heritage; to revitalise intangible cultural heritage in conjunction with introduced technologies to assist in disaster preparedness and management; and use ICH practices to recover from disasters?

I didn't mention this but the community coming together to work on the rehabilitation of the sites after Cyclone Pam was a process of collective healing in itself. Numerous civil society organisations, and the Vanuatu Cultural Centre, are making a concerted effort to record indigenous knowledge and practice in relation to disasters. So, the National Advisory Board on

Figure 4 Richard Matanik, Chair of the Lelema World Heritage Committee, illustrating the path of the sun in relation to *napsinfor*

Climate Change and Disaster Risk has created a website which is an excellent repository for this type of information. However, while the national government of Vanuatu actively supports the recording of this knowledge, given Vanuatu's status as one of the most dangerous places to live in terms of a natural disaster the government is understandably invested in strengthening infrastructure that will ensure the safety of its citizens, utilising mobile phone technology to provide early warning systems, etc, and therefore relies to a very large extent on communities to practice disaster-related ICH management before, during and after a cyclone.

As cultural heritage practitioners, we see our role within such an approach as supporting and enhancing traditional mechanisms of knowledge transmission within communities. This requires first that we work with the communities to understand how knowledge is transmitted horizontally (so, within a living community) and vertically, and Fatima talked about this a lot, in terms of inter-generationally within the same community. In Vanuatu, this task would need to be undertaken in conjunction with the local institutions – the National Museum and Cultural Centre in this case – which is in a better position to influence policy.

There is substantial evidence to suggest that much of the transmission of information about intangible cultural heritage generally, or more specifically intangible cultural heritage that helps people to survive a natural disaster, occurs between grandparents and grandchildren – the two elements of the community that have the most time on their hands but who are also the most vulnerable to disasters.

So how might we support mechanisms of knowledge transmission within communities, allowing them to reflect on their approaches to DRM? If we take, for instance, the traditional practice in Vanuatu of planting wild yams or *nalo* in anticipation of a natural disaster, at CRMD, those families which planted wild yams prior to the cyclone had enough food to last for several months. Those that didn't plant wild yams faced hunger, and a prolonged El Nino fueled drought impacted that issue. How might the wider community at CRMD and indeed the broader Pacific region learn from this experience and how can we support them in the process of knowledge transmission. One approach might be, and we've talked a little bit about this and Lizzie mentioned it as well, is to provide Pacific Island communities with the resources to stage workshops, to share information about their own knowledge and the capacity for survival. Secondly, to define the knowledge that needs to be transmitted and identify how that knowledge is transmitted. And thirdly, to pinpoint blockages to the transmission of knowledge and decide what is needed to improve transmission.

While the survival of intangible cultural heritage, and by extension human survival in the face of

disasters, requires the ongoing documentation of intangible cultural heritage, we also need to support the infrastructure, so the engine essentially, of community-based mechanisms for information sharing between families, between islands, and across generations.

* *

Questions and Comments following the Presentations by Participants

There were some brief question and answer sessions between the series of presentations by participants from the Asia-Pacific region. The major points raised were as follows:

Policy development on ICH and DRM in Bangladesh

Ms Molina (Center for Disaster Preparedness) asked about the current opportunities for policy integration and linking ICH with DRM in Bangladesh. Mr Selim (Gaanbangla Television), the first Bangladeshi presenter, noted that there is no mention of ICH in their DRM policy; however, when a human is protected, ICH is also protected. Meanwhile, they should endeavour to add ICH to their policy. Mr Mahmood (UNESCO office in Dhaka), another Bangladeshi presenter, furthered this point by mentioning that the protection of the community is closely interlinked with ICH because craftsmen like potters, weavers and *baul* singers are all part of the community, and he also added that it is the right time to push the government because a new policy is under consideration following the completion of the current term.

Dr Shaw questioned which ministry or department, either at the national or local level, could be a realistic target to apply some of the findings, given that there are so many institutes and ministries involved in policy integration and intervention in the Bangladeshi context. Mr Mahmood answered that they must involve the Ministry of Culture and should conduct the integration as an inter-ministerial activity. Adding to this, Mr Selim mentioned that he would communicate with the Ministry of Culture to further explore this new field of ICH in relation to disasters.

Traditional and indigenous knowledge related to DRM

After the presentations on Bangladesh, Mr Shing (Vanuatu Cultural Centre) asked if there was any example of traditional knowledge being used to protect people's lives, belongings or housing in times of a natural disaster. In response, Mr Mahmood further explained his presentation about the exploitation of forest resources.

Following Mr Loloma's (iTaukei Institute of Language and Culture) presentation on the traditional knowledge of cyclone indicators and practices such as emergency food preparations useful for the community's DRR, Ms Nojima (IRCI) questioned whether such knowledge and practices were effective and actually used during Cyclone Winston in 2016. In response, Mr Loloma explained that people in Fiji are now more dependent on government support rather than using traditional knowledge that has caused a delay in people's recovery, and some of the affected are still living in tents nearly a year after Winston.

Following the four presentations from the Pacific Islands (Fiji and Vanuatu), and reflecting upon her own experience of the workshop with Ms Wilson (Stepwise Heritage and Tourism) in Vanuatu, Ms Nojima commented that the Pacific Islands are fascinating due to their rich local knowledge that is very useful for DRR, but it is unfortunate that such knowledge is not really put into practice. Ms Wilson responded that Chief Roi Mata's Domain (CRMD), where they had a workshop, is on the fringes of Port Vila and has experienced a profound impact of globalisation,

whereas indigenous knowledge is still firmly embedded in everyday life in other remote areas. We could start holding workshops in such areas to discuss how such information is transmitted and how science is embraced. She added that by looking at various cases including the CRMD one, we can identify where transmission breakdowns are occurring. Then we will have a more informed picture of how transmission processes impact the resilience of these communities.

Traditional architecture in Fiji

Mr Masuda (National Task Force for the Japanese Cultural Heritage Disaster Risk Mitigation Network), who visited Navala village to conduct a post-disaster needs assessment (PDNA) on traditional building technology, recognised the resilience of traditional Navala architecture against disasters and asked Mr Loloma if it could be recommended for inscription on the UNESCO list of the 2003 Convention.

In response, Mr Loloma mentioned that they would like to list the traditional architecture in Navala as World Heritage, but there have been some problems involving the landowners. Although Navala village is best known in Fiji for retaining traditional architecture, Mr Masuda clarified that the village was established at the end of the 19th century to protect local people from enemy; hence, it is considered too recent to be listed as a heritage site despite its important history of refugees. This made UNESCO to shift its focus to the building technologies inscribed in the list of ICH. He thinks there would be less obstacles in comparison with registering tangible heritage, and it is more viable. Ms Wilson added that there were some discussions in Vanuatu about whether or not to list building knowledge on the list of ICH and agreed that they could circumvent some of the issues regarding landownership by thinking about safeguarding the village on another register.

Mr Iwamoto (IRCI) questioned Ms Edwards (Blue Shield Pasifika) about how she would like to ensure the transmission of skills such as house building in schools or in non-formal education, because sometimes it is very difficult for the younger generation to learn skills that do not accrue a financial income. Ms Edwards responded by explaining that they came up with the idea to have workshops in villages affected by Cyclone Winston, where there is a lack of carpenters with the skills to construct houses, and they are waiting for government action. Given that we cannot depend on the government entirely, it would be helpful to revive the knowledge of traditional *bure* building through workshops and encourage the villagers to rebuild using their own efforts and materials available in their backyard.

FINAL DISCUSSION

Before starting the final discussion, Ms Nojima from IRCI briefly summarised the project background and activities in FY 2016. Subsequently, she introduced the following themes to facilitate the final discussion:

1) potential of indigenous knowledge

2) the positive role of ICH in the disaster management process

3) impact of natural disasters on ICH

4) ICH and DRM in the context of sustainable development

5) the tangible and intangible relationship in DRM of cultural heritage

Due to the time constraint for the final discussion, most of the opinions and comments focused on issues related to indigenous knowledge, while other aspects were also referred to during the course of the discussion.

General comments on the project

At the beginning of the discussion, Dr Shaw provided some general comments on the working group session and the project as a whole, noting that addressing anything intangible, be it cultural heritage or a disaster, is always challenging; nonetheless, it always has a positive impact and he expected to see some tangible outputs from the research on ICH. Moreover, there are three important intervention areas which he calls the GET framework: governance, education and technology. Following are the major points that were addressed:

While we all recognise the importance of ICH, indigenous knowledge or local knowledge, it is not included in governance and decision-making either at the local level or at the national level. Therefore, it is extremely important to gain government recognition to mobilise sustainable disaster management strategies, such as early warning and other local practices during or after disasters. Among the presentations by Asia-Pacific participants, he found a very strong focus on integrating traditional indigenous knowledge and practice in DRR with scientific validation. He expressed a willingness to link IRCI with those developing science-technology plans for the countries and the region to implement the Sendai Framework, because there is strong focus on including ICH. This would also justify the governance mechanism.

ICH is mostly transmitted orally and is culture-specific; therefore, understanding how to include ICH in an educational component under UNESCO's overarching umbrella will be very important. He noticed the strong linkage between the participants' presentations and education for sustainable development (ESD), which enhances the appreciation of culture, environment and the local community, not just DRR. Linking the project with educational programmes could lead to a pilot project of IRCI in the future, which would provide an entry point to explore this linkage.

With regard to the technology part of the GET framework, validation is important. We should understand that not every element of ICH is equally useful for DRR. Some ICH elements are useful for DRR, but there also might be some knowledge that needs reviewing, especially in a

modern context. Gaining a certain level of scientific validation would be helpful for lobbying for the inclusion of ICH in the government's decision-making.

Finally, Dr Shaw added that collaborating with other researchers from different fields is important in this type of work and that not only researchers but also local government and community leaders should be invited to share their experiences. Due to a series of disasters in Japan, we have numerous experiences, and the Tohoku region in particular would be insightful in this respect. Including the perspectives of non-researchers could be useful for this project.

Indigenous knowledge, scientific validation and the ICH-DRM linkage

Mr Selim (Gaanbangla Television) and Mr Mahmood (UNESCO office in Dhaka) introduced some cases of indigenous knowledge in Bangladesh, such as the boatman's knowledge to read winds and the flowering of bamboo that signals potential famine. The latter is associated with an increase in the number of rats feeding on bamboo that eventually damage agricultural crops.

Mr Iwamoto (IRCI) proposed that we should investigate indigenous knowledge in the context of ICH safeguarding in two different ways: first, indigenous knowledge is sometimes transmitted as a form of ICH like folktales; second, it should be evaluated as ICH. Although it is very important for DRR, we cannot blindly believe in indigenous knowledge without validating it in a modern, scientific sense. Recognising that the boundary between indigenous beliefs and superstition is sometimes highly ambiguous, he questioned how and to what extent we should pursue scientific rigour or should we believe in indigenous knowledge.

Mr Shing (Vanuatu Cultural Centre) reflected upon Dr Shaw's comment on technology by touching on the link between indigenous knowledge and science and describing a series of ongoing programmes regarding traditional houses in Vanuatu. He noted that in the Pacific and in most developing countries, the majority of people do not have enough money to purchase good houses. Vanuatu's traditional houses with roofs touching and embedded into the ground can withstand earthquakes and certain strength of cyclone; however, they are temporary because the materials deteriorate over time and have to be replaced every 5–10 years. The structure itself is important but, in Vanuatu, many people who live in rural areas do not value the strength of these traditional houses. However, he thinks traditional housing is very cost-effective because the materials are readily available in the surrounding environment. Conducting a scientific assessment of the strength of traditional houses in Vanuatu would be helpful in addition to establishing recommendations for building better traditional housing. This will also raise awareness among the local people.

Mr Kubota (Tokyo National Research Institute for Cultural Properties) introduced some methods for transmitting the knowledge of past disaster events such as the tsunami monuments from Japan, and he acknowledged the significance of local knowledge for DRR. However, he reminded us that some knowledge cannot be useful because it may not be relevant today. As an example, he cited the traditional practice to reduce flood risks in a major river in the Kanto region, where people in the upstream sacrifice their agricultural fields by releasing the potentially flooding river water into the fields to save the downstream region. Such practices are not possible in contemporary Japan for many reasons, including various stakeholders' rights. Therefore, it is important to pay attention to changing social backgrounds that make local knowledge unusable today, and the same could be applied to certain elements of ICH that have discriminatory implications.

Mr Kubota further commented on cases of indigenous knowledge that may be superstitions with no scientific validation, such as rituals and dances for rain or no-rain. Such knowledge and practice may not be useful in terms of DRR science; however, they might be valuable for

revitalising the local community's vigour. From the ICH perspective, it is important to investigate how ICH was used before, during and after a disaster. When ICH is a viable component of people's day-to-day activities, it would be highly functional during a disaster. It would help safeguard people's health during a disaster, and this could be a valuable asset for DRM.

Ms Wilson (Stepwise Heritage and Tourism) remarked that Mr Kubota's comment confronted all of her concerns about the sometimes unhappy marriage between ICH and DRM. She noted that cultural heritage is founded on significance and value. When we start to question the significance and value that exist in the minds of the people who own their cultural heritage, we are questioning the value of the place or the tradition. Therefore, as we move forward, it will be important to think about the way we question, when we question the use of ICH. In the case of Chief Roi Mata's Domain (CRMD), there are many different types of ICH or indigenous knowledge that are incredibly useful in a disaster context, but there are also stories that could not be validated scientifically. She thought approaching CRMD from that perspective would be interesting, citing her experience of running a community DRM workshop using the traditional knowledge (*nafsan natoon*) as the founding principle, where she had to ask questions sensitively and respectfully.

Agreeing with Ms Wilson's point, Ms Molina (Center for Disaster Preparedness) commented that we should look at the meaning-making process that is internal to the communities, not just people's ICH, and it is unfair to impose external justifications or indicators for DRR. Alternatively, we can question how local people define DRM and what it means to them. We should be careful of how we converge external with internal processes involved in DRM to better understand culture and humanity at large.

Ms Dalisay (University of the Philippines-Diliman) also noted that some engineers are deeply sceptical of local knowledge or the value of practices that have not been validated. She suggested that the validation of ICH could be an entry point to open a dialogue, beginning with the science part and gradually introducing the value of those that have not been validated because from local people's perspective, ICH and local knowledge is also science, or ethno-science. It will be a challenge to develop a research method to validate local knowledge that has not yet been validated. However, it may find validation later on, with the right technology and a creative mind-set.

Ms Wilson added that it would be worth thinking about how we link the two concepts of ICH and DRM in this project, and how we decide what to include or exclude from our investigations, due to the issues mentioned previously. She identified the Vanuatu disaster shelter as a good example of a happy marriage; it is open to questioning and will not impact the local values. Another example is food security, where people are incorporating technologies and crops from outside Vanuatu but combining them with their ICH.

Summarising the discussion so far, Mr Iwamoto stated that the broad theme of ICH and DRM has two core dimensions. One is ICH safeguarding as a new dimension of DRM, meaning that alternative means of recording and protecting ICH from disasters will be necessary. The other is that we should think about interdisciplinary research to remove barriers between the natural and social sciences and should involve the local communities as protecting local communities is very important. Exploring this dimension would also link the project to policy and community development.

Tangible and intangible heritage in the context of DRM

A brief discussion of how to protect and safeguard tangible heritage alongside ICH followed. Ms Nojima (IRCI) requested Ms Wilson to further comment on the issue by referring to Ms Wilson's

presentation on CRMD as a World Heritage site rich in intangible knowledge and practices.

Ms Wilson explained that she has been working on CRMD from a cultural heritage perspective, not from DRM point of view, but she has started to investigate risk management at the site. One component of CRMD, the Fels Cave, has many risks associated with a recent roof fall. This has posed a major risk to the tourists visiting the site and has been affecting the community's tourist economy. If the cave collapses tangible aspects and the value of the site would be affected. Moreover, the intangible components of the site, such as the stories associated with the site would be affected and the people would no longer have access to the place.

Ms Nojima added that other elements of CRMD have been maintained by people transmitting the associated stories and significance of the place, which could be actively used to protect the area. Then, she asked if the Ifugao rice terraces, which are also a World Heritage site, are exposed to any disaster risks.

Ms Dalisay commented that major risks include pests or 'worms' that erode the walls of terraces, in addition to landslides. She further added that components of tangible cultural heritage are the evidence of intangible knowledge and practice; therefore, when you conserve the tangible aspects of a culture, you also conserve its intangible aspects.

Ms Dalisay also shared the case of Batanes in the northern part of the Philippines, where a form of traditional architecture is known that uses small boulders for the house walls with a thatched roof. Recently the local government has placed a policy to prevent the extraction of boulders from the beach because the increasing population on the island accelerated the extraction of small boulders for their houses. People are now building their houses with concrete walls and iron roofs, but this is not appropriate for the environment of Batanes, as traditional houses are more typhoon resistant. This raises the issue of the role of ICH in sustainable development.

Concluding the final discussion at the international working group session, Ms Nojima thanked all participants for their important contributions and comments and asked for further cooperation with IRCI over years to come to help the project deliver some tangible outputs from research on ICH. Ms Yamanashi (Tokyo National Research Institute for Cultural Properties), in her closing remarks, noted that ICH and indigenous knowledge should be shared with younger generations and also with newcomers as the community is always changing, and she hoped that our discussions would open a new dimension to enhance our understanding of ICH in the context of DRM.

ANNEX 1

International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI)

Preliminary Research on ICH Safeguarding and Disaster Risk Management in the Asia-Pacific Region

International Working Group Session

(30 January 2017, Tokyo)

Programme

10:00 Opening Remarks
Wataru Iwamoto (Director-General, IRCI)

Part I Session with Dr Rajib Shaw

10:10–11:40 *Science Technology and Disaster Risk Reduction: The Missing Link*
Guest speaker: Rajib Shaw
(Executive Director, Integrated Research on Disaster Risk / IPO)

11:40–13:10 Lunch hosted by IRCI
Venue: Restaurant Yurinoki (Toyokan, Tokyo National Museum)

Part II Cases of Disaster-Risk Management and ICH in Asia-Pacific Countries

13:10–13:30 *ICH Safeguarding and Disaster Risk Management in Bangladesh*
Rahmatullah al Mahmud Selim (Gaanbangla Television)

13:30–13:50 *Disaster and ICH: Bangladesh Context*
Md. Amanullah Bin Mahmood (UNESCO Office in Dhaka)

13:50–14:10 *Integrating Local and Indigenous Knowledge in Disaster Risk Management: Learning from Philippine communities*
Fatima G. J. Molina (Center for Disaster Preparedness)

14:10–14:30 *Narratives of risk and coping in response to typhoon Haiyan in selected communities in the Philippines*
Soledad N. Dalisay (University of Philippines-Diliman)

14:30–14:50 *ICH and Disaster Risk Management in Fiji*
Ilaitia S. Loloma (iTaukei Institute of Language and Culture)

14:50–15:10 *Blue Shield Pasifika and ICH Safeguarding in Fiji*
Elizabeth F. D. Edwards (Blue Shield Pasifika)

<< Break >>

15:20–15:40 *ICH and Disaster Risk Management in the Republic of Vanuatu*
Richard J. Shing (Vanuatu Cultural Centre)

15:40–16:00 *Enhancing Traditional Mechanisms of ICH Transmission at Chief Roi Mata's Domain, Vanuatu*
Meredith L. Wilson (Stepwise Heritage and Tourism Pty. Ltd.)

16:00–16:10 *ICH Safeguarding and Disaster-Risk Management in the Asia-Pacific Region: Summary of FY2016 and Prospects*
Yoko Nojima (IRCI)

16:10–17:10 Discussions

17:10 Closing Remarks
Emiko Yamanashi (Deputy Director-General, Tokyo National Research Institute for Cultural Properties)

ANNEX 2

International Research Centre for Intangible Cultural Heritage in the Asia-Pacific Region (IRCI)

Preliminary Research on ICH Safeguarding and Disaster Risk Management
in the Asia-Pacific Region

International Working Group Session
(30 January 2017, Tokyo)

List of Participants

Name	Title/Association
Guest Lecturer	
Rajib Shaw	Executive Director International Program Office, Integrated Research on Disaster Risk (IRDR)
Participants from Asia-Pacific Countries	
Soledad Natalia Dalisay	Professor, Chair Department of Anthropology, University of Philippines-Diliman (Philippines)
Fatima Gay Jamilosa Molina	Senior Research Associate Center for Disaster Preparedness (Philippines)
Elizabeth Fiona Daveta Edwards	Secretariat Blue Shield Pasifika (Fiji)
Ilaitia Senikuraciri Loloma	Executive Officer Special Revitalization Unit iTaukei Institute of Language and Culture (Fiji)
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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.

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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

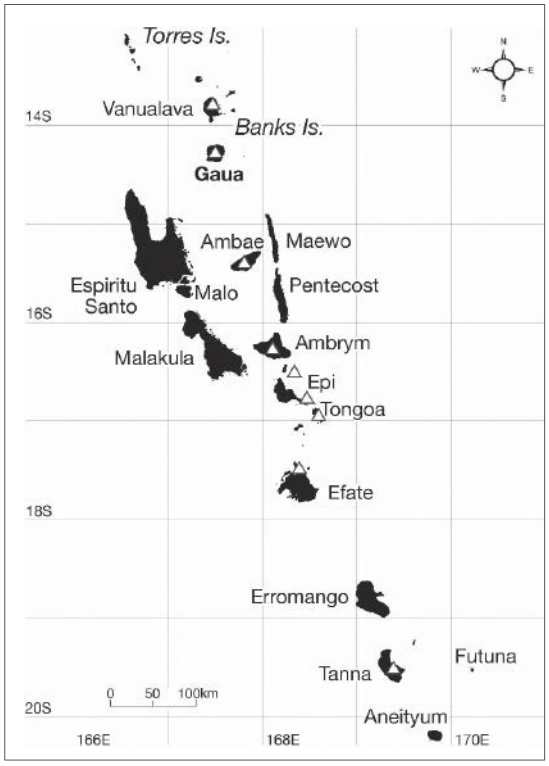

Figure 1
Map of Vanuatu
(△indicates the location of active volcano)

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.

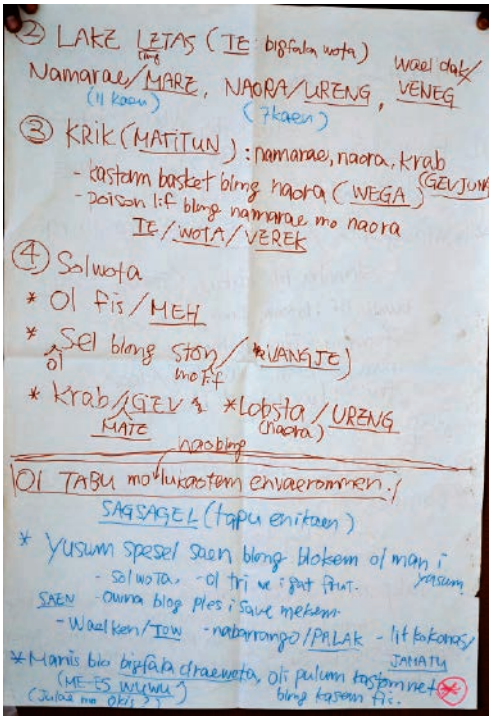

Figure 2
Sample of ICH elements listed by a group of participants

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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REFERENCES

Bani, P., Boudon, G., Balcone-Boissard, H., Delmelle, P., Quiniou, T., Lefèvre, J., Bule, E. G., Shinohara, H. and Lardy, M. (2016). The 2009-2010 eruption of Gaua volcano (Vanuatu archipelago): Eruptive dynamics and unsuspected strong halogens source. *Journal of Volcanology and Geothermal Research,* 322: 63-75.

Caminade, J-P., Charlie, D., Kanoglu, U., Koshimura, S., Matsutomi, H., Moore, A., Ruscher, C., Synolakis, C. and Takahashi, T. (2000). Vanuatu Earthquake and Tsunami Cause Much Damage, Few Casualties. *EOS Earth & Space Science News,* 81 (52): 641-647.

Codrington, R. (1891). *The Melanesians: Studies in their anthropology and folk-lore*. Oxford: Clarendon Press.

Dick, T. (2014). Vanuatu water music and the Mwerlap diaspora: Music, migration, tradition, and tourism. *AlterNative: An International Journal of Indigenous Peoples*, 10 (4), pp. 392-407.

Francois, A. (2012). The dynamics of linguistic diversity: Egalitarian multilingualism and power imbalance among Northern Vanuatu languages. *International Journal of the Sociology of Language,* 214: 85-110.

Huffman, K. (2005). *Traditional money banks in Vanuatu: Project survey report*. [pdf] Port Vila: Vanuatu National Cultural Council, Paris: UNESCO. Available at: https://ich.unesco.org/doc/src/00418-EN.pdf [Accessed 24 Mar. 2018].

IRCI (2017*). Launch of IRCI's new research project focusing on natural disasters and ICH*. [online] Available at: https://www.irci.jp/news/2016-0727/ [Accessed 24 Mar. 2018].

Kolshus, T. (1999). *Purism, syncretism, symbiosis: Cohabiting traditions on Mota, Banks Islands, Vanuatu.* PhD. University of Oslo.

Nakashima, D. (ed.) (2010). *Indigenous knowledge in global policies and practice for education, science and culture*. Paris: UNESCO.

NOAA National Centers for Environmental Information (NCEI) (n.d.). Search results for "Vanuatu". *The Significant Earthquake Database*. [online] Available at: https://www.ngdc.noaa.gov/nndc/struts/results?bt_0=&st_0=&type_17=EXACT&query_17=None+Selected&op_12=eq&v_12=VANUATU&type_12=Or&query_14=None+Selected&type_3=Like&query_3=&st_1=&bt_2=&st_2=&bt_1=&bt_4=&st_4=&bt_5=&st_5=&bt_6=&st_6=&bt_7=&st_7=&bt_8=&st_8=&bt_9=&st_9=&bt_10=&st_10=&type_11=Exact&query_11=&type_16=Exact&query_16=&bt_18=&st_18=&ge_19=&le_19=&type_20=Like&query_20=&display_look=1&t=101650&s=1&submit_all=Search+Database [Accessed 24 Mar. 2018].

RSMC Nadi-Tropical Cyclone Centre (n.d.) *Tropical cyclone seasonal summary 2002–03*. [pdf] Nadi: Fiji Meteorological Service. Available at: http://www.webcitation.org/5rXVeMgCD?url=http://www.met.gov.fj/documents/TC_Seasonal_Summary_02-031190690457.pdf [Accessed 24 March 2018].

Shaw, R., Takeuchi, Y. and Uy, N. (2008). *Indigenous knowledge: Disaster risk reduction, policy note*. Bangkok: UNISDR Asia and the Pacific.

SPC (2015). 2015 Vanuatu National Population and Household Estimates by Island. [pdf] Noumea: Statistics for Development Division, Secretariat of the Pacific Community. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/vanuatu.pdf [Accessed 24 Mar. 2018].

Speiser, F. (1996). *Ethnology of Vanuatu: An early twentieth century study*. Honolulu: University of Hawaii Press.

Willie, E. (2016). *Forestry and protected area management project: Cultural survey of Lake Letas*. Unpublished Report. Port Vila: Vanuatu Cultural Centre.

UNESCO (2016). *Basic texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage*. 2016 Edition. [pdf] Paris: Intangible Cultural Heritage Section, UNESCO. Available at: https://ich.unesco.org/doc/src/2003_Convention_Basic_Texts-_2016_version-EN.pdf [Accessed 24 Mar. 2018].

United Nations Office for the Coordination of Humanitarian Affairs (OCHA) (2011). South West Pacific Tropical Cyclone Yasi Situation Report No. 2. [pdf] New York and Geneva: OCHA. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/A3A94BB301FCC274C125782B00376EC1-Full_Report.pdf [Accessed 24 Mar. 2018].

Vanuatu Meteorological Service (1994). *Tropical cyclones in Vanuatu: 1847 to 1994*. [pdf] Port Vila: Vanuatu Meteorological Service. Available at: https://www.webcitation.org/5uJzQPW0U [Accessed 24 Mar. 2018].

Volcano Live (n.d.) *Gaua Volcano*. [online] Available at: http://www.volcanolive.com/gaua.html [Accessed 22 Jun. 2017].

World Meteorological Organization (2009). RSMC Nadi 2006/2007 and 2007/2008 Tropical Cyclone Season Summary. In: *RA V tropical cyclone committee for the South Pacific and Southeast Indian Ocean: Twelfth session final report*. [pdf] Geneva: World Meteorological Organization. Available at: http://www.webcitation.org/5p4NIhFWf?url=http://www.wmo.int/pages/prog/www/tcp/documents/RAVTCC-12FinalReport.pdf [Accessed 24 Mar. 2018].

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

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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

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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.

REFERENCES

Campbell, J. (1984). *Dealing with disaster: Hurricane response in Fiji.* Honolulu/Suva: East-West Center/ Government of Fiji.

Government of Fiji (2016). *Fiji post-disaster needs assessment: Tropical cyclone Winston, February 20, 2016*. Suva: Government of Fiji.

Government of Vanuatu (2015). *Vanuatu post-disaster needs assessment: Tropical cyclone Pam, March 2015*. Port Vila: Government of Vanuatu.

Lal, B. J. (2012). *Intersections: History, memory, discipline*. Canberra: ANU E Press.

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

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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

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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.

REFERENCES

Bündnis Entwicklung Hilft (2017). *World risk report: Analysis and prospects 2017*. Berlin: Bündnis Entwicklung Hilft.

Cole, F.C. (1915). *Traditions of the Tinguian: A study in Philippine folk-lore*. Field Museum of Natural History Publication 180, Anthropological Series, vol. XIV, no 1. Chicago: Field Museum of Natural History.

Cole, F.C. (1922). *The Tinguian: Social, religious and economic life of a Philippine tribe*. Field Museum of Natural History Publication 209, Anthropological Series, vol. XIV, no. 2. Chicago: Field Museum of Natural History.

Local Governance Regional Resource Centre (n.d., a). *LGU Profile: Province of Abra*. [online] Baguio: Department of the Interior and Local Government, Cordillera Administrative Region. Available at: http://www.dilgcar.com/index.php/2015-07-10-04-38-51/province-of-abra [Accessed 19 Mar. 2018]

Local Governance Regional Resource Centre (n.d., b). *LGU Profile: Province of Ifugao*. [online] Baguio: Department of the Interior and Local Government, Cordillera Administrative Region. Available at: http://www.dilgcar.com/index.php/2015-07-10-09-25-49/province-of-ifugao [Accessed 19 Mar. 2018]

Respicio, N.A. (n.d.) *Unraveling the Itneg epic, redefining Itneg identity*. (Unpublished abstract paper for Panel in Oral Literature and Sense of Belonging).

Peralta, J.T. (2000) *Glimpses, peoples of the Philippines*. Manila: National Commission for Culture and the Arts (NCCA).

Peralta, J.T. (ed.) (2013) *Pinagmulan: Enumerations from the Philippine inventory of intangible cultural heritage*. Manila: National Commission for Culture and the Arts (NCCA) and ICHCAP.

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

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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.

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

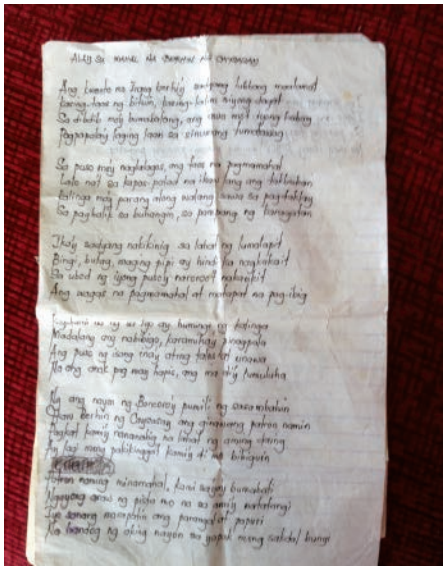

Figure 5

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.

REFERENCES

Arunotai, N. (2008). Saved by an old legend and a keen observation: the case of Moken sea nomads in Thailand. In: R. Shaw, N. Uy and J. Baumwoll, eds., *Indigenous knowledge for disaster risk reduction: good practices and lessons learned from experiences in the Asia-Pacific region,* Bangkok: UNISDR, pp. 73–78. Available at: http://www.unisdr.org/files/3646_IndigenousKnowledgeDRR.pdf [Accessed 1 May 2015].

Cerdena, G. (2008). Indigenous know-how on Mayon Volcano's lava-spittle mysticism. In: R. Shaw, N. Uy and J. Baumwoll, eds., *Indigenous knowledge for disaster risk reduction: good practices and lessons learned from experiences in the Asia-Pacific region,* Bangkok: UNISDR, pp. 55–58. Available at: http://www.unisdr.org/files/3646_IndigenousKnowledgeDRR.pdf [Accessed 1 May 2015].

Dalisay, S.N.M. (2014). Engaging local knowledge for disaster risk reduction. *Kasarinlan: Philippine Journal of Third World Studies*, 29(2), pp. 75–102.

Dalisay, S.N.M. and Tatel. C.P.Jr. (2011). The ravaging storm: providing an anthropological lens to the study of disaster in two barangays in Tiwi, Albay. In: C.P. Tatel, Jr., ed., *Ethnographies of disaster*, Legaspi: Aquinas University of Legaspi, pp. 19–36.

GOVPH (2010). *Republic Act No. 10121.* [online] Available at: http://www.officialgazette.gov.ph/2010/05/27/republic-act-no-10121/ [Accessed 21 Jan. 2018].

Henry, D. (2007). Anthropological contributions to the study of disaster. In: D. McEntire, ed., *Disciplines, disaster and emergency management: the convergence of concepts, issues and trends from the research literature,* Illinois: Charles C. Thomas, pp. 111–123.

Irfanullah, H.M. and Motaleb, M.A. (2011). Reading nature's mind: disaster management by indigenous peoples of Bangladesh. *Indian Journal of Traditional Knowledge,* [online] 10(1), pp. 80–90. Available at: http://nopr.niscair.res.in/bitstream/123456789/11068 /4/IJTK%2010%281%29%2080-90.pdf [Accessed 1 May 2015].

The Official Website of LOBO (2010). *Map & Location*. [online] Available at: http://www.lobo.gov.ph/index.php?option=com_content&view=article&id=52&Itemid=59 [Accessed 23 Feb. 2018].

Ngoc Huy, N. and Shaw, R. (2008). Weather forecasting through indigenous knowledge for crop cultivation in the drought prone area of Vietnam. In: R. Shaw, N. Uy and J. Baumwoll, eds., *Indigenous knowledge for disaster risk reduction: good practices and lessons learned from experiences in the Asia-Pacific region,* Bangkok: UNISDR, pp. 79–82. Available at: http://www.unisdr.org/files/3646_IndigenousKnowledgeDRR.pdf [Accessed 1 May 2015].

Pareek, A. and Trivedi, P.C. (2011). Cultural values and indigenous knowledge of climate change and disaster prediction in Rajasthan, India. *Indian Journal of Traditional Knowledge*, [online] 10(1), pp. 183–89. Available at: http://nopr.niscair.res.in/bitstream/123456789/11079/1/IJTK%2010%281%29%20183-189.pdf [Accessed 30 Apr. 2015].

Phivolcs (n.d.). *Taal volcano*. [online] Available at: http://www.phivolcs.dost.gov.ph/html/update_VMEPD/Volcano/VolcanoList/taal.htm.

Roncoli, C., Crane, T., and Orlove, B. (2009). Fielding climate change in Cultural Anthropology. In: Crate, S. and Nuttal, M., eds., *Anthropology and climate change: from encounters to actions,* California: Left Coast Press, Inc., pp. 87–115.

Rumbach, A. and Foley, D. (2014). Indigenous institutions and their role in disaster risk reduction and resilience: evidence from the 2009 tsunami in American Samoa. *Ecology and Society*, [online] 19(1), p. 19. Available at: http://dx/doi/org/10.5751/ES-06189-90119 [Accessed 30 Apr. 2015].

Volcanodiscovery (n.d.). *Taal volcano*. [online] Available at: https://www.volcanodiscovery.com/taal.html

[Accessed 21 Jan. 2018].
Taal Heritage Town (n.d.). *Hand Embroidery.* [online] Available at: http://taal.com.ph/index.php/local-products/hand-embroidery/ [Accessed 21 Jan. 2018].

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?

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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

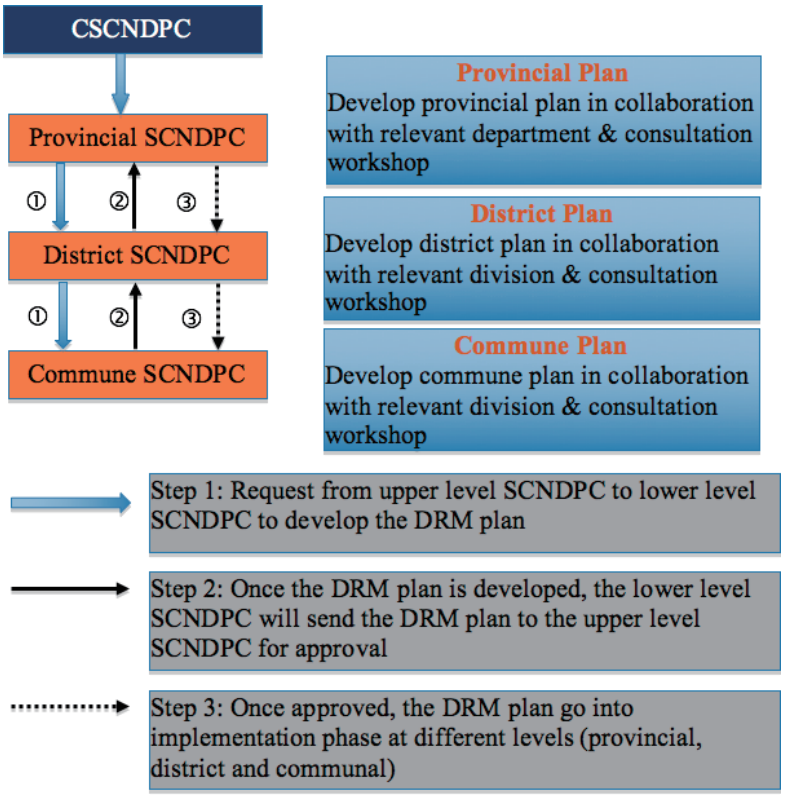

Figure 1
Traditional disaster risk management planning (Adapted from Bach Tan Sinh et al., 2013, p. 48)

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.

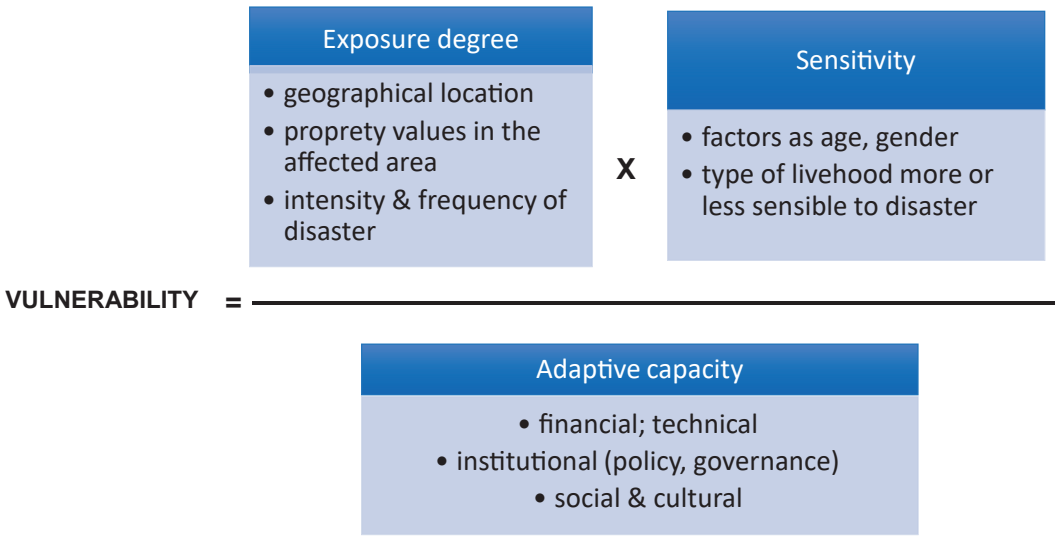

Figure 3 Vulnerability framework

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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REFERENCES

Bach Tan Sinh, Vu Canh Toan and Nguyen Duy Can and Nguyen Tuan Anh (2013). *Vietnam - Disaster Risk Management.* In: Adaptation Knowledge Platform (ed.) *Understanding adaptation planning: selected case studies in Nepal, Philippines and Vietnam*, Bangkok: Stockholm Environment Institute, pp. 42-69. Available at: www.asiapacificadapt.net or weADAPT.org.

Bảo Hà TMB (2017). *Báo cáo thiệt hại do mưa đá, lốc xoáy tại di tích lịch sử Đền Bảo Hà, thống kê thiệt hại về tài sản quy ra tài chính, mưa đá lốc xoáy ngày 25/03/2017* [Report on damages caused by hail, whirlwind on 25 March 2017 of Bảo Hà temple, inventory of losses in material assets and estimated costs], *26 March 2017*. Bảo Hà: Bảo Hà Temple Management Board.

Bích Hợp (2017). Lào Cai gặp khó khăn trong cảnh báo thiên tai [Lào Cai province's facing difficulty in

disaster warning]. *Người đưa tin.* [online] Available at: http://www.nguoiduatin.vn/lao-cai-gap-kho-khan-trong-canh-bao-thien-tai--a351081.html. [Accessed 13 Dec. 2017]

Chu Thuỳ Liên (2004). *Tìm hiểu văn hoá dân tộc Hà Nhì ở Việt Nam* [Understanding Hà Nhì Culture in Vietnam]. Hà Nội: Văn hoá Dân tộc.

Đặng Nghiêm Vạn, Chu Thái Sơn and Lưu Hùng (2000). *Ethnic minorities in Vietnam.* Hà Nội: The Gioi.

Duong Tuan Nghia (2017). *Tri thức dân gian trong khai thác và bảo vệ rừng của người Hà. Nhì Đen ở huyện Bát Xát, tỉnh Lào Cai* [Folk knowledge in forest exploitation and protection of the Ha Nhi Den people in Bat Xat district, Lao Cai province]. PhD, Vietnam National Institute of Culture and Arts Studies.

GSO (2010). *The 2009 population and housing census Vietnam: Completed results.* [online] Hà Nội: Statistical Publishing House. Available at: http://www.gso.gov.vn/default_en.aspx?tabid=515&idmid=5&ItemID=10799 [Accessed 7 Oct. 2017].

Hà Thanh and Chí Tuệ (2017). Sủng Hoảng một năm sau cơn lũ dữ [Sủng Hoảng one year after the destructive flood]. *Tuổi trẻ.* [online] Available at: https://tuoitre.vn/sung-hoang-mot-nam-sau-con-lu-du-1351066.htm [Accessed 10 Nov. 2017]

Hồng Hà (2010). Tập trung chữa cháy rừng tại Lào Cai [Effort to stop forest fire in Lào Cai]. *VGPNEWS.* [online] Available at: http://baochinhphu.vn/Tin-noi-bat/Tap-trung-chua-chay-rung-tai-Lao-Cai/27491.vgp [Accessed 4 Oct. 2017]

IFRC (2014). *World disasters report: Focus on culture and risk*. Switzerland: International Federation of Red Cross and Red Crescent Societies.

Khổng Diễn (ed.) (1996). *Những đặc điểm kinh tế-xã hội các dân tộc miền núi phía Bắc.* Hà Nội: Khoa học Xã hội.

Lãng Quân (2010). Hoàng Liên Sơn thành … Hoả Diệm Sơn! [Hoàng Liên moutain becomes Fire Moutain]. *An ninh thế giới.* [online] Available at: http://antg.cand.com.vn/Phong-su/Hoang-Lien-Son-thanh%E2%80%A6-Hoa-Diem-Son-297033/ [Accessed 7 Oct. 2017]

Lào Cai DARD (2008). *Report of the steering committee of flood and storm prevention and control*. Lào Cai: Department of Agriculture and Rural Development.

Lào Cai DARD (2015). *Statistics of natural disasters 2004–2015.* Lào Cai: Department of Agriculture and Rural Development.

Lào Cai DCST (2013). *Báo cáo công tác quản lý tại các di tích trên địa bàn Lào Cai.* [Report on Management of cultural sites in Lào Cai province]. *Mid-2013 report*. Lào Cai: Department of Culture, Sports and Tourism.

Lào Cai DCST (2015). *Safeguarding and promotion of indigenous knowledge associated with the ecological environment of the Black Hà Nhì in Lào Cai Province, Vietnam, 2014–2015.* International Assistance from the Intangible Cultural Heritage Fund, Final Narrative Report. Hà Nội: Unesco Vietnam.

Lào Cai Gov (2016). Lào Cai: Provincial People's Committee. Available at: http://laocai.gov.vn/ubnd-laocai/4/469/54239/281714/Dan-so/Dan-so.aspx [Accessed 5 Oct. 2017].

LCPCP (2015). *Đề án số 08-ĐA/TU ngày 27/11/2015 của Tỉnh ủy Lào Cai về phát triển văn hóa, thể thao tỉnh Lào Cai giai đoạn 2016–2020* [Project no 08 on the development of culture and sports of province of Lào Cai for the period of 2016–2020]. Lào Cai: Provincial Communist Party.

LCPPC (2016). *Báo cáo tình hình thiệt hại do cơn bão số 1, 2, 3; phương án khắc phục hậu quả thiên tai và một số đề xuất kiến nghị của tỉnh Lào Cai* [Report on damages and losses caused by storms no 1, 2, 3; recovery plan and recommendations of Lào Cai province], *31/8/2016*. Lào Cai: Provincial People's Committee.

LCPPC (2017). Quyết định phê duyệt dự án 'Bảo vệ và phát huy giá trị di sản văn hóa phi vật thể Quốc gia trên địa bàn tỉnh Lào Cai giai đoạn 2017–2020' [Decision of Lào Cai Provincial People's Committee on the approval of the project: 'Safeguarding and Promotion of National ranked ICH in Lào Cai province for the period 2017–2020'], 09/05/2017. Lào Cai: Provincial People's Committee.

Lê Thị Thanh Hương and Nguyễn Trung Thành (2016). Nghiên cứu tri thức và kinh nghiệm sử dụng cây thuốc của các dân tộc thiểu số ở tỉnh thái nguyên để bảo tồn và phát triển bền vững [The Knowledge and Experience of the Medicinal Plants Using of Minorities Ethnic in Thái Nguyên Province for Conservation and Sustainable Development]. *Tạp chí Khoa học ĐHQGHN: Khoa học Tự nhiên và Công nghệ,* 32, pp. 55–64.

LSO (2015). *Laocai Statistical Yearbook 2014.* [online] Hà Nội: Statistical Publishing House. Available at:

http://www.laocai.gov.vn/SiteFolders/Root/3372/NewFolder/Nien giam 2014.pdf [Accessed 5 Oct. 2017].

Lý Khai Phà (1998). Tìm hiểu một số vấn đề về văn hoá dân tộc Hà Nhì [Understanding some issues of Hà Nhì people culture]. *In:* Tô Ngọc Thanh and Nguyễn Xuân Kính (ed.) *Giữ gìn và phát huy tài sản văn hoá các dân tộc ở Tây Bắc và Tây Nguyên* [Safeguarding and Promotion of Culural Assets of Ethnic Groups in the Northwest region and Central Highlands]. Hà Nội: Khoa học Xã hội, pp. 135–147.

Mai Thanh Sơn, Lê Đình Phùng and Lê Đức Thịnh (2011). *Biến đổi khí hậu: tác động, khả năng ứng phó và một số vấn đề về chính sách (Nghiên cứu trường hợp đồng bào các dân tộc thiểu số vùng núi phía bắc)* [Climate Change: Impacts, Response Capacity and Policy Issues (Cases Studies of Northern Mountainous Ethnic Minorities)]. Hà Nội: Climate Change Working Group and Ethnic Minority Working Group.

McElwee, P. (2010). *The social dimensions of adaptation of climate change in Vietnam (English)*. Development and climate change discussion paper, no. 17, Washington, DC: World Bank. http://documents.worldbank.org/curated/en/955101468326176513/The-social-dimensions-of-adaptation-of-climate-change-in-Vietnam

Minister of Agriculture and Rural Development (1999). Quyết định của Bộ trưởng Bộ NNPTNT số 140/1999/QĐ-BNN-ĐCĐC ngày 14/10/1999 về nội dung, tiêu chí định canh định cư [Decision 140 on the contents and criteria for sedentarization]. Hà Nội: Ministry of Agriculture and Rural Development.

Prime Minister (2016). Quyết định số 1207/QĐ-TTg ngày 27/7/2016 của Thủ tướng Chính phủ phê duyệt Đề án 'Bảo tồn, phát triển văn hóa các dân tộc thiểu số Việt Nam đến năm 2020' của Bộ VH, TT và DL [Decision no 1207 of Prime Minister approving the Program of 'Conservation and promotion of culture of ethnic minorities in Vietnam up to 2020' of the Ministry of Culture, Sports and Tourism]. Hà Nội: Government of Socialist Republic of Vietnam.

Nguyễn Ngọc Thanh (ed.) (2016). *Tri thức dân gian của người Dao trong sử dụng và bảo vệ nguồn tài nguyên thiên nhiên* [Folk knowledge of Dao group in using and protecting natural resources]. Hà Nội: Khoa học Xã hội.

Nguyễn Thế Huệ (2003). Dân số các dân tộc ở Việt Nam thế kỷ XX [Population of ethnic groups in Viêt Nam in the 20th century]. *In:* Khổng Diễn and Bùi Minh Đạo (ed.) *Dân tộc học Việt Nam thế kỷ XX và những năm đầu thế kỷ XXI* [Ethnology in Viêt Nam in the 20th century and in the first years of 21rst century]. Hà Nội: Khoa học Xã hội, pp. 383–397.

Nguyễn Trọng Yêm (2006). *Nghiên cứu đánh giá trượt lở, lũ quét - lũ bùn đá tại vùng trọng điểm tỉnh Lào Cai (H. Bát Xát, H. Sa Pa và TP. Lào Cai - tỉnh Lào Cai) và kiến nghị các giải pháp phòng tránh, giảm nhẹ thiệt hại* [Assessment of lanslide, flash flood - mud and rock flood in the most affected areas in Lào Cai province (Bát Xát district, Sa Pa district and Lào Cai city) and recommendation of disaster prenvention and mitigation]. Nghiên cứu xây dựng bản đồ phân vùng tai biến môi trường tự nhiên lãnh thổ Việt Nam. [Studying mapping of natural disasters typology of Việt Nam territory. Code KC-08–01, Hà Nội: Institute of Geography, Vietnam Academy of Science and Technology.

Nguyễn Trường Giang (2015). *Ruộng bậc thang ở Việt Nam, bảo tồn và phát triển bền vững* [Terraced fields in Viêt Nam, preservation and sustainable development]. Hà Nội: Chính trị Quốc gia.

Phạm Ngọc Triển (2016). Lào Cai: Không khuyến khích trồng cây Thảo quả dưới tán rừng tự nhiên [Lào Cai: the cardamom plantation is not encouraged in the primary forest]. *Tài nguyên & Môi trường*. [online] Available at: https://baotainguyenmoitruong.vn/moi-truong/lao-cai-khong-khuyen-khich-trong-cay-thao-qua-duoi-tan-rung-tu-nhien-1122625.html [Accessed 13 Dec. 2017]

Phan Phương Anh (2008). *Tri thức bản địa trong sản xuất nông lâm nghiệp: trường hợp làng Phìn Ngan, xã Trịnh Tường, huyện Bát Xát, tỉnh Lào Cai* [Indeginous knowledge in agricultural and forest production: the case of Phìn Ngan village, Trịnh Tường commune, Bát Xát District, Lào Cai province]. In: Nguyễn Thị Hiền (ed.) *Văn hoá sinh thái của các tộc người ở huyện Bát Xát, tỉnh Lào Cai* [Ecological Culture of Ethnic Groups in Bát Xát District, Lào Cai Province], Vietnam Institute of Cultural and Arts Studies. Hà Nội. Unpublished report.

Phan Phương Anh and Vũ Cảnh Toàn (2013). Intangibles Cultural Heritage Conservation and Challenges in the Context of Climate Change: A Case Study of Cà Mau. In: Võ Quang Trọng and Nguyễn Chí Bền (ed.) *Museum & cultural heritage: Facing climate change*, Conference Proceedings, 11–12 June 2012, Huế, Viêt Nam. Hà Nội: Social Sciences Publishing House, pp. 466–487.

Phàn Phù Lìn (2007). Ecological Culture of the Red Dao Group in Bát Xát District, Lào Cai Province. (Personal communication, August 2007, Phìn Ngan village, Trịnh Tường commune, Bát Xát district, Lào

Cai province).
Phương Liên (2017). Lũ quét làm 1 người mất tích tại Trịnh Tường – Bát Xát [Flash Flood causing one missing person in Trịnh Tường - Bát Xát]. *Lao Cai Radio and Television.* [online] Available at: http://laocaitv.vn/chinh-tri-xa-hoi/lu-quet-lam-1-nguoi-mat-tich-tai-trinh-tuong-bat-xat [Accessed 5 Oct. 2017]
Sa Pa Gov (2017). Lào Cai: Sa Pa District People's Committee. Available at: http://sapa.laocai.gov.vn/tp-sapa/1227/27461/53369/262630/Gioi-thieu-ve-huyen-Sa-Pa/Dan-so.aspx [Accessed 7 Oct. 2017].
Schipper, E. L. F. (2010). Religion as an integral part of determining and reducing climate change and disaster risk: an agenda for research. *Der Klimawandel*. Wiesbaden: VS Verlag für Sozialwissenschaften | GWV Fachverlage GmbH, pp. 377–393.
SRV (2013). Luật phòng chống thiên tai [Law on Natural Disaster Prevention and Control] (LNDPC). Hà Nội: National Assembly of Socialist Republic of Vietnam.
Trần Hữu Sơn (2017). *Văn hoá dân gian ứng dụng* [Applied Folk Culture]. Hà Nội: Văn hoá Dân tộc Publishing House.
Trần Hữu Sơn (2018). ICH and Natural Disasters in Lào Cai Province. (Personal communication, January 2018, Hà Nội).
Trần Thục and Koos Neefjes (ed.) (2015). *Viet Nam special report on managing the risks of extreme events and disasters to advance climate change adaptation*. Ha Noi: Vietnam's Institute of Meteorology, Hydrology and Environment and UNDP.
Trang Do, Cuong Nguyen and Tung Phung (2013). *Assessment of natural disasters in Vietnam's northern mountains*. Hanoi: Munich Personal RePEc Archive. http://mpra.ub.uni-muenchen.de/54209/
Wilson, M. and Ballard, C. (2017). *Safeguarding and Mobilising Intangible Cultural Heritage in the Context of Natural and Human-induced Hazards*. UNESCO's ICH Section.
World Bank (2010). *Vietnam - second northern mountains poverty reduction project (English)*. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/568511468133544695/Vietnam-Second-Northern-Mountains-Poverty-Reduction-Project
Xuân Mai (1998). Về người Hà Nhì Đen ở Lào Cai [Black Hà Nhì in Lào Cai]. In: *Giữ gìn và phát huy tài sản văn hoá các dân tộc ở Tây Bắc và Tây Nguyên* [Safeguarding and Promotion of Culural Assets of Ethnic Groups in the Northwest region and Central Highlands]. Hà Nội: Khoa học xã hội, pp. 73–79.

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

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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.

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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) - Quan tuan tranh ceremony (25 May Lunar month) - 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 - Tornadoes - Flash floods - Landslides (riverside, hill) - 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 - Tornadoes - Flash floods - Landslides (riverside, hill) - Heatwaves	Hail, whirlwinds, trees collapsed, partially damaged the ground of the temple.
- Temple ceremony on 20 January and 20 September Lunar month		- Riverbank erosion - Flooding - Heatwaves - Tornadoes - 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. Worship of Mother Goddesses Hau vat in the Mother Goddesses Acclaim Ceremony *Nem Con* (or *Sen*) throw the candles, tug, wrestling	- *Hau dong* - *Cheo* singing - Upriver Mother Goddesses worship Festival - Carnival of Upriver Mother Goddesses Acclaim - Performance of practice of worship Mother Goddesses - Cinnamon fair and festival	- Riverbank erosion - Flooding - Heatwaves - Tornadoes - 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

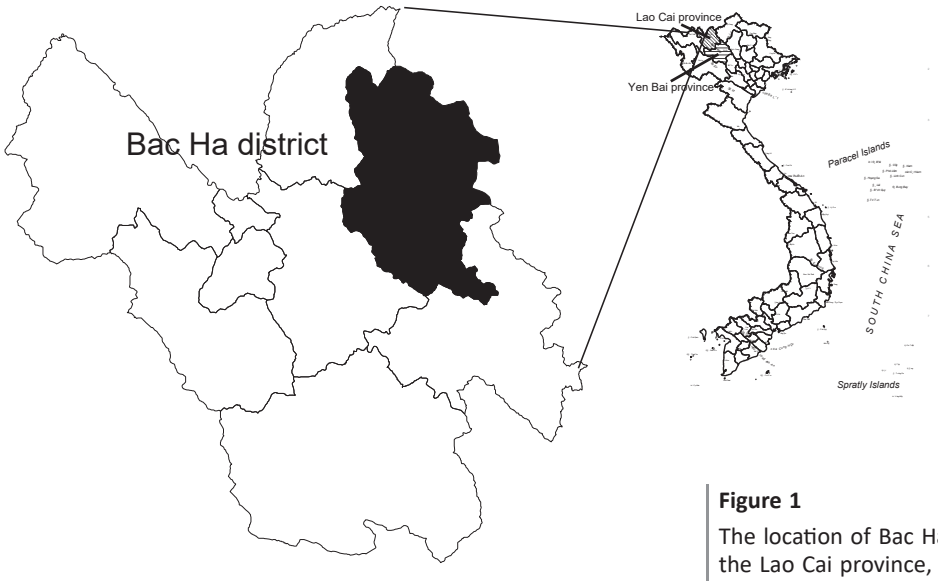


Figure 1
The location of Bac Ha district in the Lao Cai province, Vietnam

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

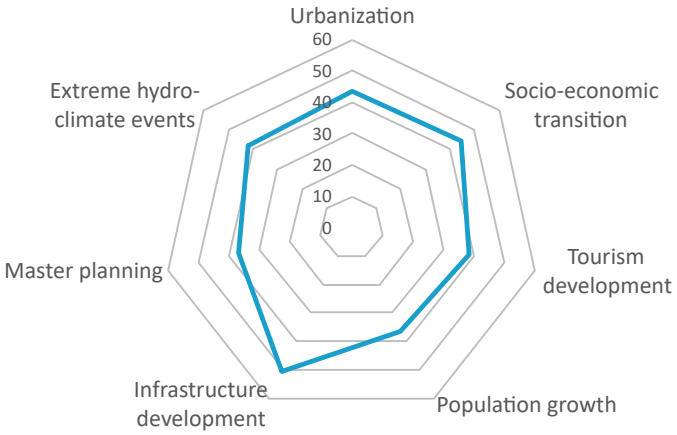
civilised wedding, funeral and festival ceremonies.

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.

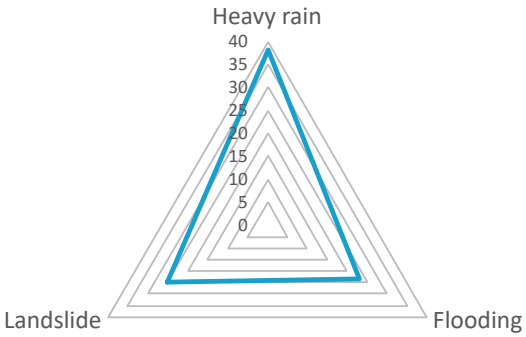
DISCUSSION AND CONCLUSION

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.

REFERENCES

Bac Ha District Government (2009). *The activity plan of cultural heritage development in the Bac Ha town during 2010–2015*.

CCFSC (Vietnam Central Committee for Flood and Storm Control) (2009). *Handbook for damage assessment and aid demand assessment by natural hazards*.

CCFSC (Central Committee for Flood and Storm Control) (2014). *The report of damage caused by floods, flash floods, landslides and preventive measures in recent years. Documentation for the online conference in August 20, 2014 of the CCFSC*.

Dimuonnoi (2017). *Nhân dịp Hội Đền Bắc Hà ở Lào Cai sắp đến – cùng bàn về giá trị lễ hội và tinh thần dân tộc qua lễ hội* (Bac Ha temple festival in the Lao Cai province). [online] Available at: http://dimuonnoi.com/hoi-den-bac-ha-o-lao-cai-gia-tri-le-hoi-va-tinh-than-dan-toc-qua-le-hoi [Accessed 18 Dec. 2017].

Dulichvtv (2017). *Điểm du lịch tại Lào Cai - Dinh Hoàng A Tưởng (Lâu Đài Hoàng Yến Chao)* (A tourist site in the Lao Cai province – Hoang A Tuong palace (Hoang Yen Chao castle)). [online] Available at: http://www.dulichvtv.com/guide_Dinh_Hoang_A_Tuong_Lau_Dai_Hoang_Yen_Chao__222.html [Accessed 18 Dec. 2017].

GSO (Vietnamese Government Statistical Office) (2009). *Statistical yearbook of Vietnam 2008*. Hanoi: Statistical Publishing House.

IPCC (2007). *Climate change 2007: Impacts, adaptation, and vulnerability*. New York: Cambridge University Press.

IPCC (2014). *Climate change 2014 Synthesis Report*. Geneva: IPCC.

MONRE (Ministry of Natural Resources and Environment) (2016). *Climate change and sea level rise scenarios for Vietnam*. Hanoi: MONRE.

Sapalaocai (2017). *Những trải nghiệm phải thử ở chợ phiên Bắc Hà* (Experiences have to try in Bac Ha market). [online] Available at: http://www.sapalaocai.com/laocai/Nhung-trai-nghiem-phai-thu-o-cho-phien-Bac-Ha.htm [Accessed 18 Dec. 2017].

Trần Hoà (2017). Kỳ bí dinh thự Hoàng A Tưởng (Mysterious Hoang A Tuong palace). *Anninhthudo*. [online] Available at: http://anninhthudo.vn/phong-su/ky-bi-dinh-thu-hoang-a-tuong/434824.antd [Accessed 18 Dec. 2017].

NCHM (National Center for Hydrology and Meteorology) (2005). *Characteristics of hydrology and meteorology in Vietnam*. Hanoi. 72 pages.

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

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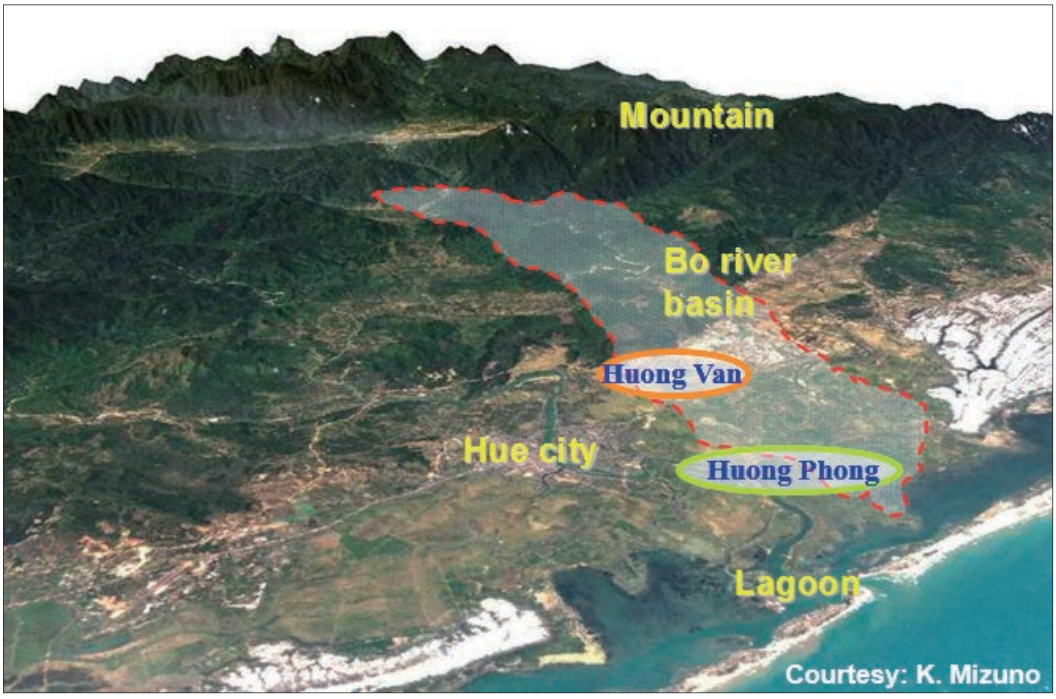

Figure 1 Research sites: Huong Van and Huong Phong communes

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

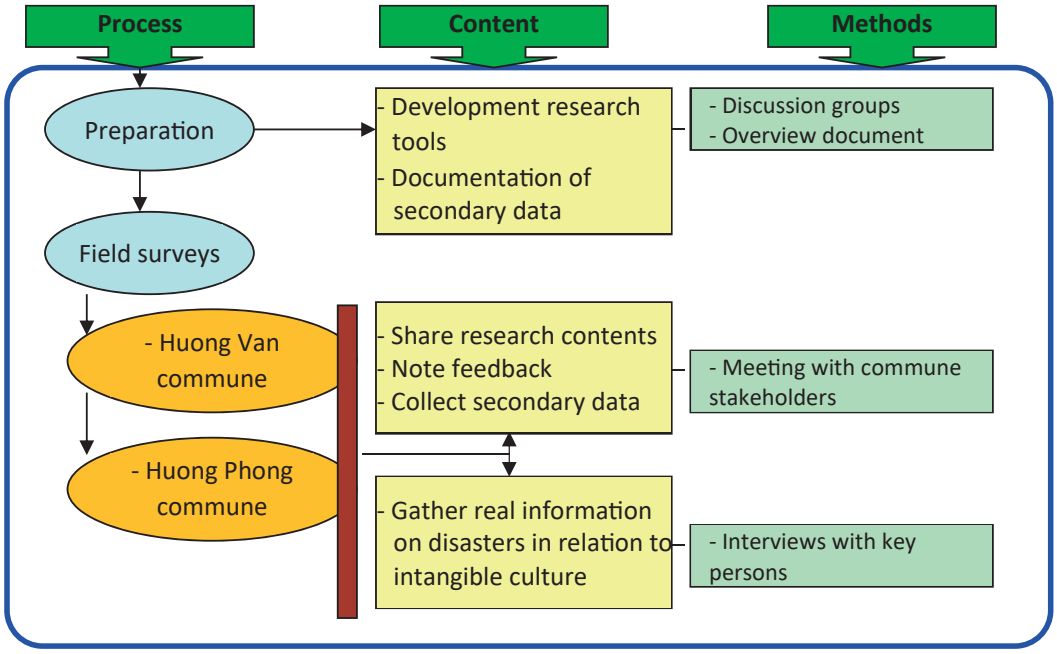

Figure 2 Process, content and research method

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 Storm, tropical cyclone Water uptake Hurricane	Flash flood Landslide Sea bank erosion River bank erosion Drought salt intrusion	Tsunami 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

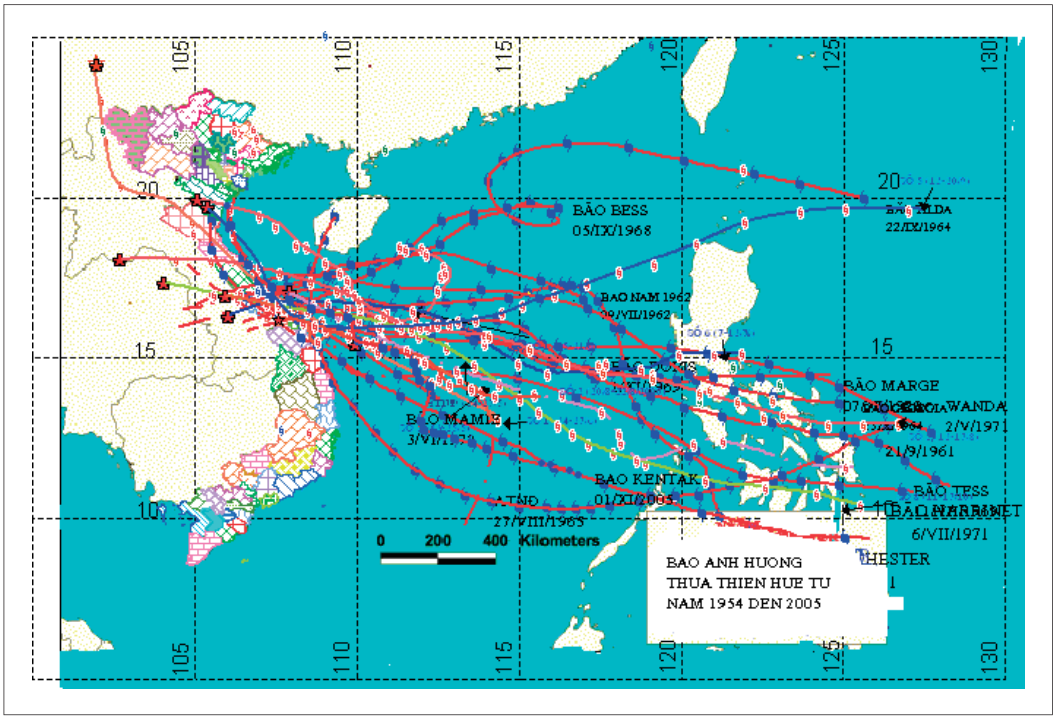

Figure 5 Direction of storms in Thua Thien Hue province during 1954–2005

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).

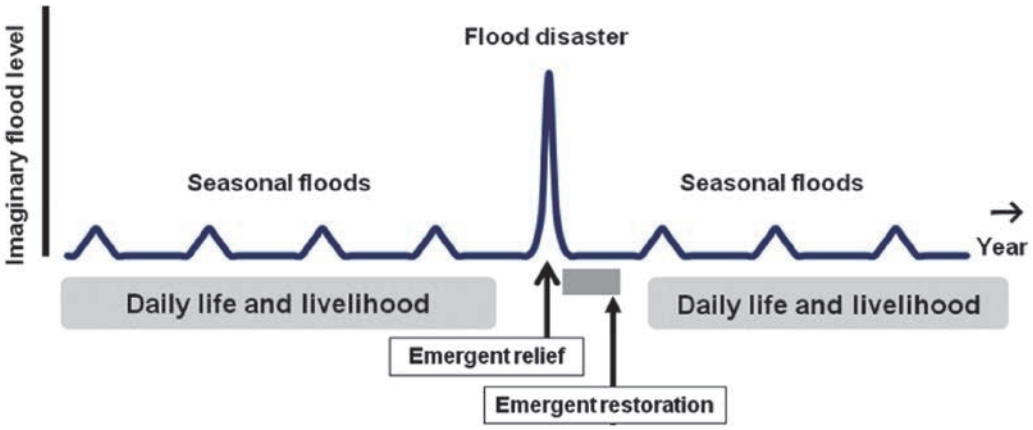

Figure 7 Concept and local perception related to floods (Adapted from Le Van An, Tanaka and Kobayashi, 2013)

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)

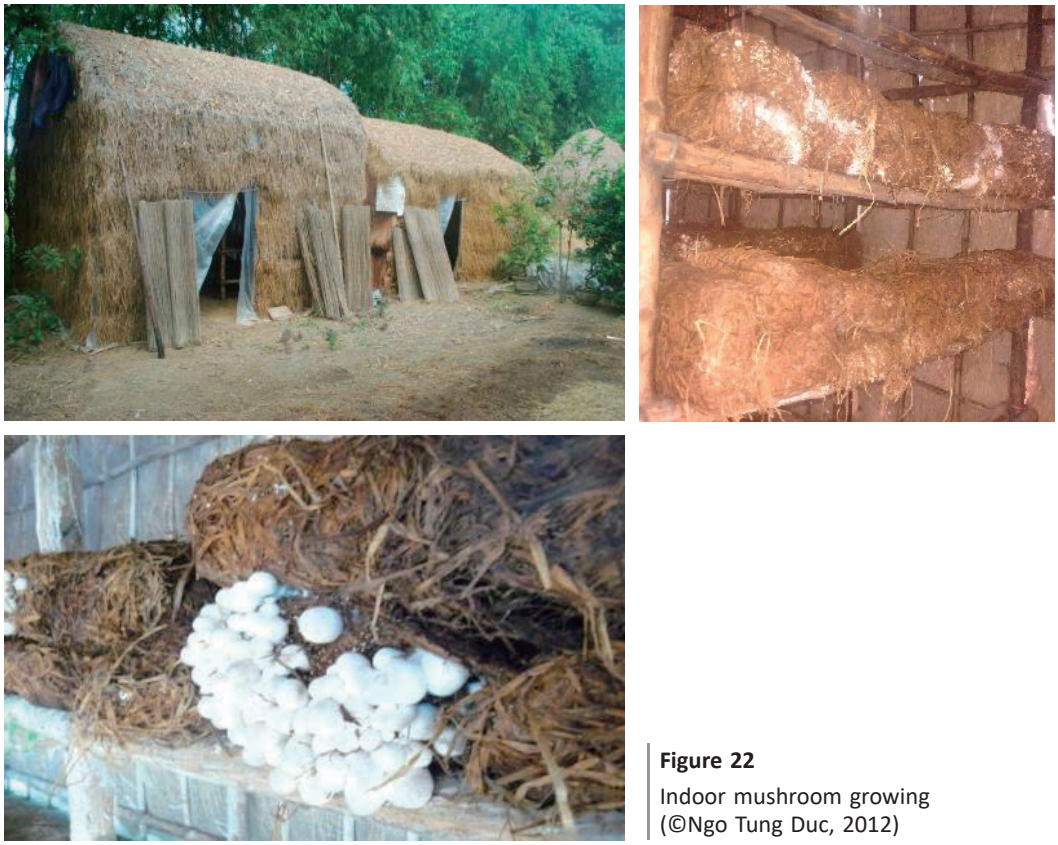

Figure 22
Indoor mushroom growing
(©Ngo Tung Duc, 2012)

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.

REFERENCES

Le, V. A., Tanaka, U. and Kobayashi, H. (2013). *Project report on local livelihood diversification for vulnerable people in natural disaster prone areas*. Ha Noi: Agriculture publishing house.

Nguyen, V. (2008). *Natural disaster in Thua Thien Hue provinces and integrated prevention solution*. Thua Thien Hue Hydro-meteorological Forecast Center.

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.

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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.

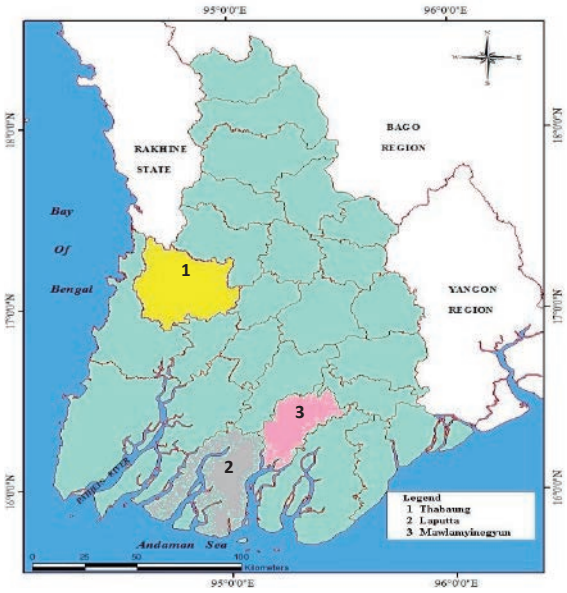

Figure 2

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

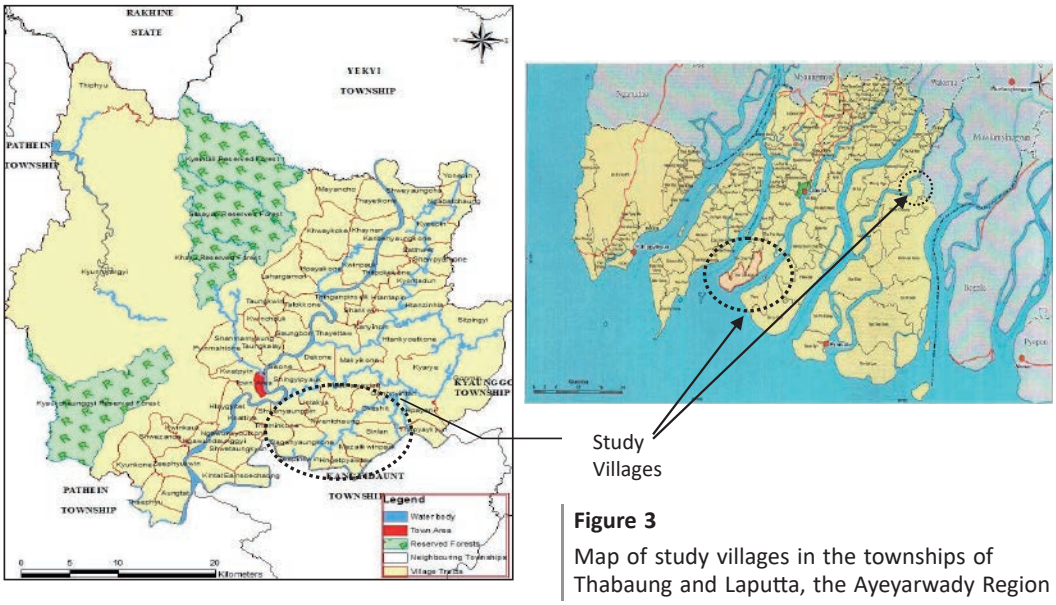

Figure 3

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.

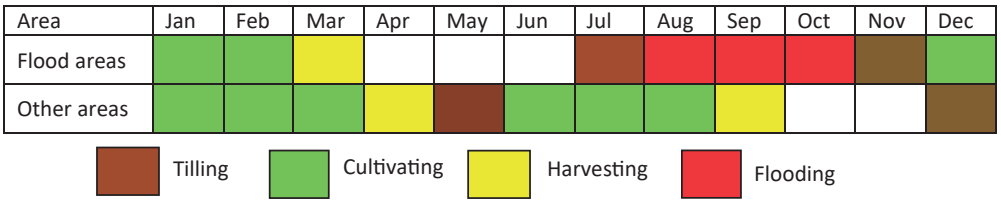

Figure 7 Cropping calendar of flood affected areas and non-flooding areas

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.

REFERENCES

Department for International Development (DFID) (2009). *Hazard profile of Myanmar*. Department for International Development United Kingdom, Jointly prepared by Union of Myanmar.

Department of Population, Ministry of Immigration (DPMIP) (2015). *The 2014 Myanmar population and housing census: Ayeyawady Region census report volume 3- N*. [pdf] Nay Pyi Taw: Department of Population Ministry of Labour, Immigration and Population. Available at: http://www.dop.gov.mm/moip/index.php?route=product/product&path=54-52&product_id=65 [Accessed 30 Jun. 2015].

Delta Alliance (2015). *Vulnerability and resilience assessment of Ayeyarwady Delta, Myanmar*. Full Assessment Report. Available at: www.delta-alliance.org [Accessed 9 Nov. 2017].

Foster, M. (2017). *Climate change, vulnerability, and migration in Myanmar*. Unpublished Master's Thesis, Department of International Environment and Development Studies, Noragric, Norwegian University of Life Sciences.

Roussy, S. (2008). *Water, sanitation & hygiene disaster risk reduction assessment: Ayeyarwady Division.* External Final Report, Action Contre la Faim (ACF) Mission-Myanmar. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/A7B8301B3212F276C12574B40047FDD2-Full_Report.pdf [Accessed 26 Oct. 2016].

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?