



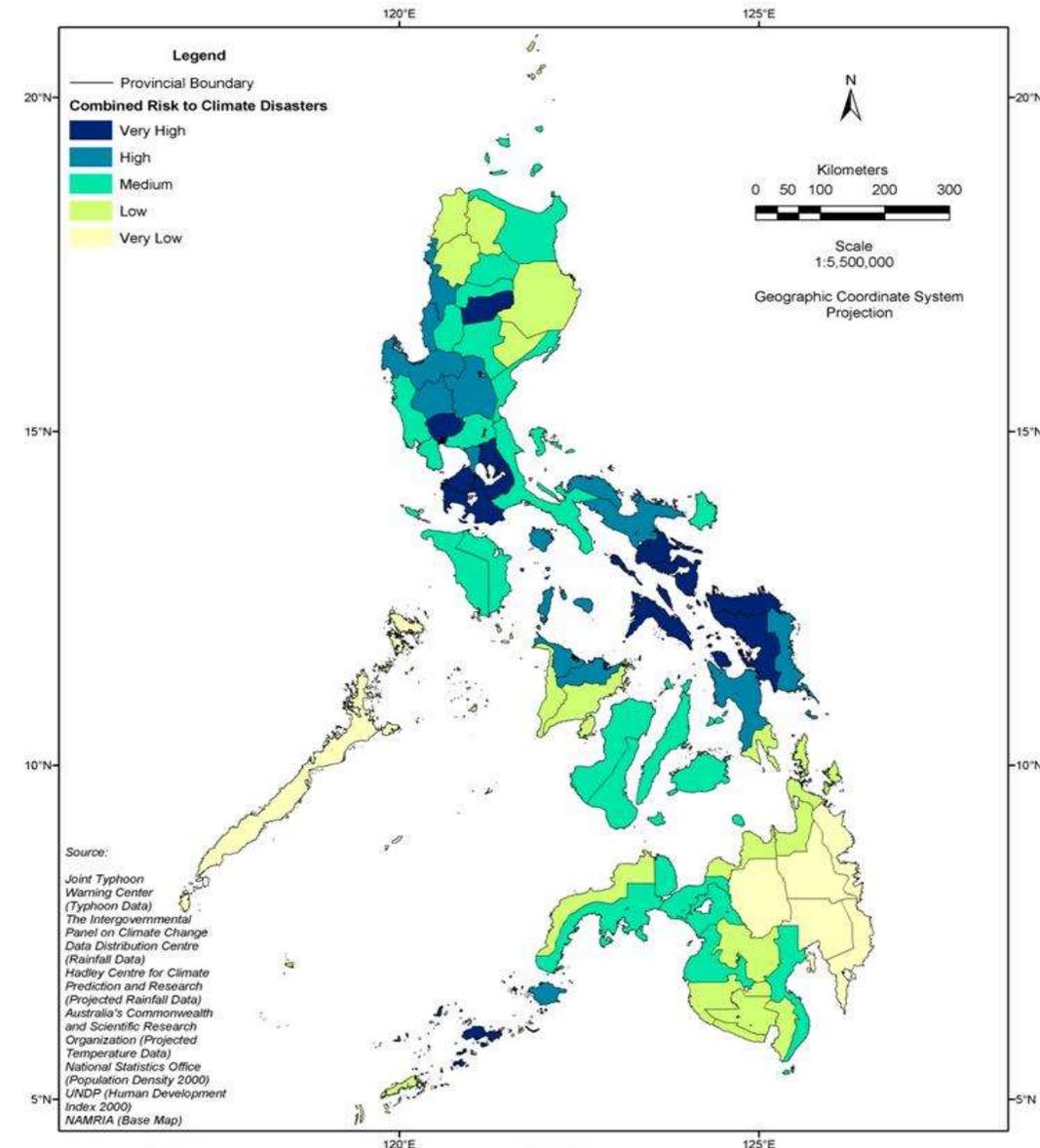
Integrating the Indigenous Knowledge Systems and Practices (IKSP) on Disaster Risk Management and Health Risk Reduction

Ma. Teresa G. de Guzman, PhD

University of the Philippines, Manila

- The Philippines was fourth in the world among countries hit by the highest number of disasters over the past 20 years, according to the United Nations Office for Disaster Risk Reduction (UNISDR).
- A total of 274 disasters were recorded in the Philippines from 1995 to 2015, trailing the United States (472), China (441), and India (288).

Combined Risk to Climate Disasters



MANILA OBSERVATORY



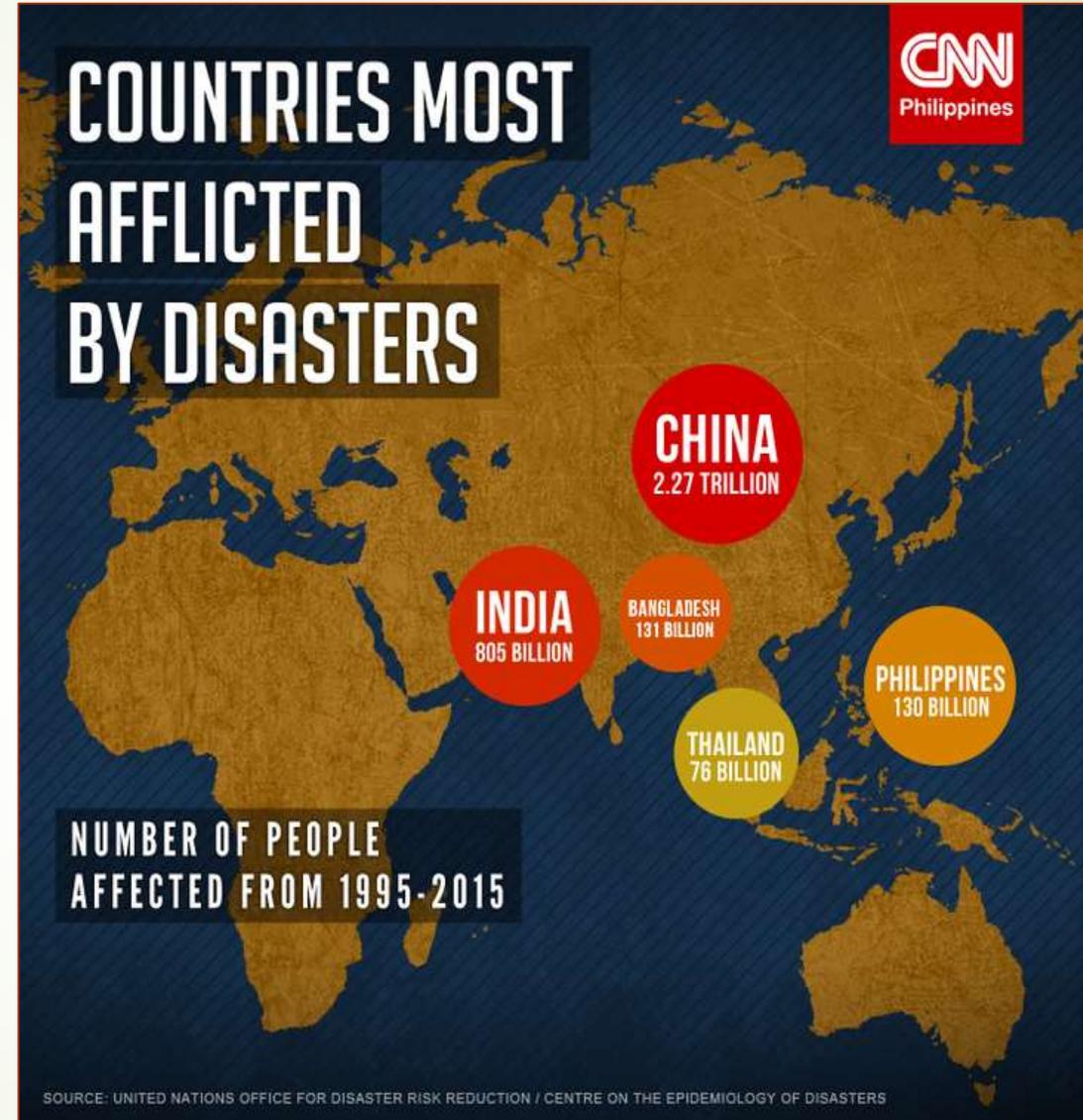
DEPARTMENT OF ENVIRONMENT AND
NATURAL RESOURCES

TABLE 1: LIST OF CULTURAL HERITAGE SITES RECENTLY DAMAGED BY DISASTERS (CONTINUED)

YEAR	COUNTRY	HAZARD	DESCRIPTION
2013	 <p>THE PHILIPPINES</p>	Earthquake	Out of a total 3.2 million people affected by the 2013 earthquake, 348,000 were displaced. Many historic churches in Bohol collapsed (<i>NDRRMC 2013</i>); damage to the churches was estimated at over US\$30 million. Given Philippine religious traditions, the social impact was likely greater than the economic costs.
2011	 <p>THAILAND</p>	Floods	The 2011 floods killed more than 220 people and inundated over 200 ancient temples in the Ayutthaya World Heritage site and its periphery (Taylor 2011). Economic damage and losses in the cultural heritage sector were estimated at over B 7.5 billion, or about US\$250 million (<i>GFDRR 2012</i>).
2011	 <p>JAPAN</p>	Tsunami, earthquake	The 2011 earthquake and tsunami left approximately 19,500 dead or missing. The total number of cultural heritage properties damaged by the earthquake exceeds 1,000 (<i>ICOMOS 2011</i>).
2010	 <p>NEW ZEALAND</p>	Earthquake	The Christchurch earthquake of 2011 inflicted heavy damage on the New Zealand economy, with losses estimated at about 8 percent of GDP (<i>Parker and Steenkamp 2012</i>). Christchurch is also a gateway for tourism, accounting for 20 percent of the sector's revenues. Much of the tourism in the region is linked to cultural heritage in areas like Central City, where most of the damage occurred.

a. World Monuments Fund, "Cultural Heritage Sites of Nepal," <https://www.wmf.org/project/cultural-heritage-sites-nepal>.

- The Philippines is also among the top 10 countries with the highest absolute number of affected people, with 130 million.
- The report found that 90 percent of major disasters were caused by weather-related events. A collaboration by the UNISDR and the Centre for Research on the Epidemiology of Disasters (CRED), the study reports that 606,000 people died and 4.1 billion people were injured or left homeless because of the aforementioned disasters.
- The human impact of the disasters were most felt in Asia, with 332,000 deaths and 3.7 billion people affected.



The 15 most exposed countries worldwide

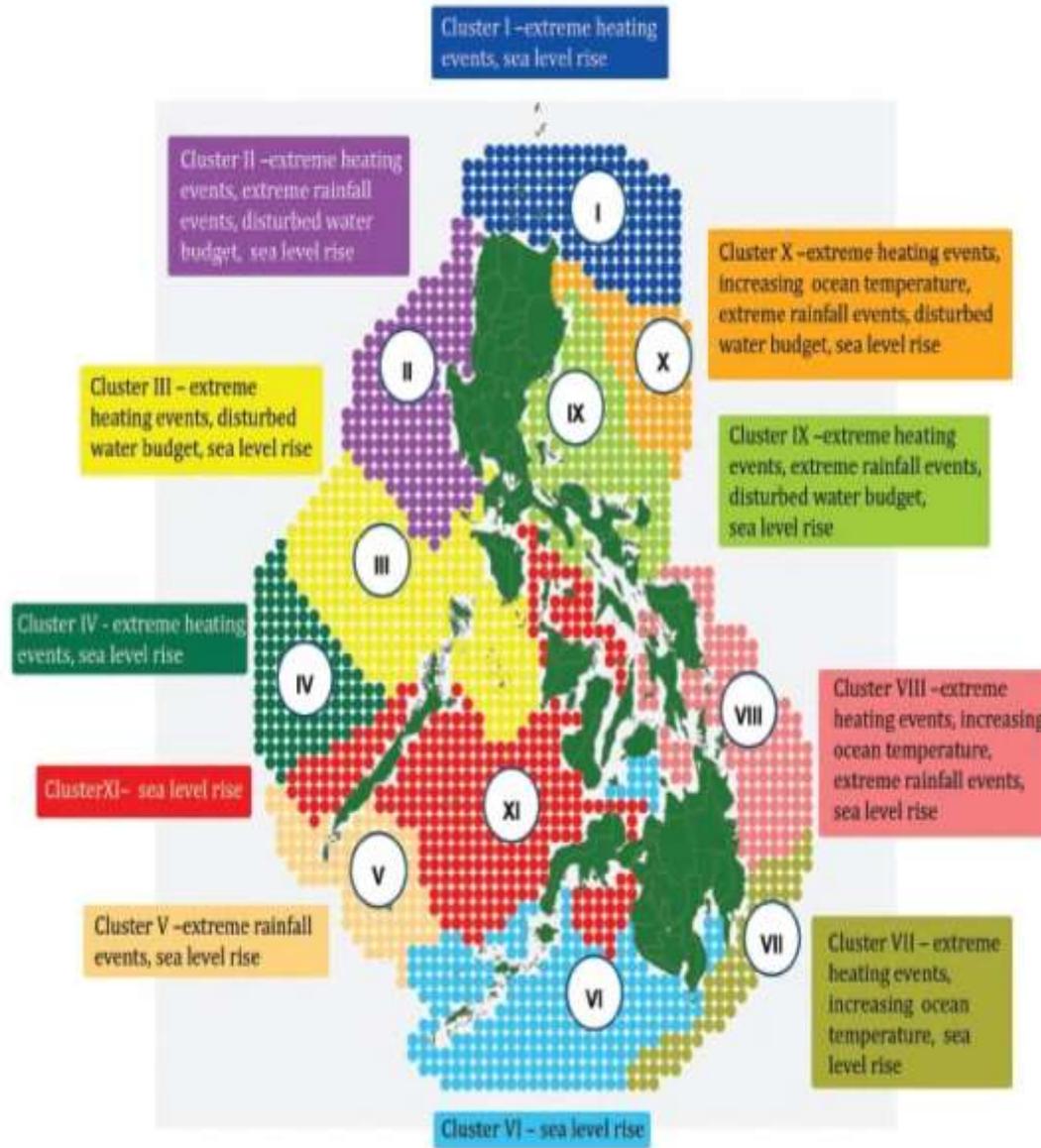
Country	Exp. (%)	Rank
Vanuatu	63.66	1.
Tonga	55.27	2.
Philippines	52.46	3.
Japan	45.91	4.
Costa Rica	42.61	5.
Brunei Darussalam	41.10	6.
Mauritius	37.35	7.
Guatemala	36.30	8.
El Salvador	32.60	9.
Bangladesh	31.70	10.
Chile	30.95	11.
Netherlands	30.57	12.
Solomon Islands	29.98	13.
Fiji	27.71	14.
Cambodia	27.65	15.

The 15 countries that are most at risk worldwide

Country	Risk (%)	Rank
Vanuatu	36.28	1.
Tonga	29.33	2.
Philippines	26.70	3.
Guatemala	19.88	4.
Bangladesh	19.17	5.
Solomon Islands	19.14	6.
Brunei Darussalam	17.00	7.
Costa Rica	17.00	8.
Cambodia	16.58	9.
Papua New Guinea	16.43	10.
El Salvador	16.05	11.
Timor-Leste	15.69	12.
Mauritius	15.53	13.
Nicaragua	14.62	14.
Guinea-Bissau	13.56	15.

Frank Schuengel for wheninmanila.com

PHILIPPINE EXPOSURE MAP ON CLIMATE CHANGE



- Philippines isn't just susceptible to climate change because it's an archipelago located in a part of the world that gets a lot of strong tropical storms.
- According to the Philippine Department of Environment and Natural Resources, the specific geographical factors contribute to its particular vulnerability. Regional wind patterns, for example, can worsen the risk posed by extreme rainfall events.



Yolanda in Tacloban. Leyte



Mount Pinatubo, Philippines

- Killing almost 800 and leaving an estimated 100,000 homeless, Mount Pinatubo's eruption in June 1991 was 10 times larger than the Mount St. Helens' eruption and one of the biggest of the 20th century. It emitted a cloud of smoke and ash over 19 miles high. The evacuation of more than 70,000 people and the volcanic event were broadcast worldwide, making Pinatubo (in)famous throughout the world.

- More than 350 people died during the **eruption**, most of them from collapsing roofs. Disease that broke out in evacuation camps and the continuing mud flows in the area caused additional **deaths**, bringing the total **death toll** to 722 people. The event left more than 200,000 people homeless.

The Aetas during Mt. Pinatubo Eruption





Objective of the Study

To identify the value of Indigenous Knowledge Systems and Practices (IKSP) on disaster risk management in reducing the health risk among the IPs



Specific Objectives

- A. Identify the health risk among the IPs affected by the disaster
- B. Describe the IKSP on disaster risk reduction management among the Aeta community
- C. Identify the mitigation process of the IPs on disaster and health risk to become more resilient
- D. To assess the planning and implementation process of the local government on disaster risk reduction management

Research Area

- **Botolan**, officially the **Municipality of Botolan**, is a 1st class municipality in the province of Zambales, Philippines.
- According to the 2015 census, it has a population of 57,707 people.
- Botolan is known for its Aeta population and where Mount Pinatubo is located.

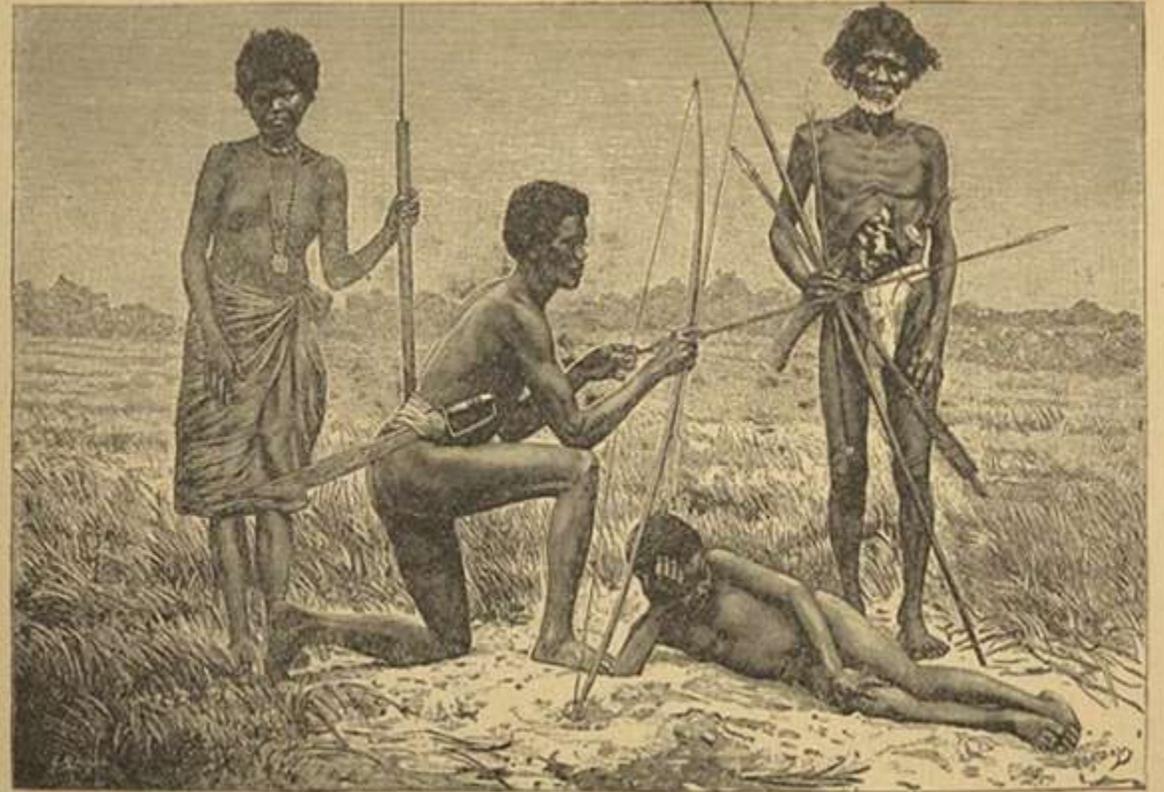


Methods

- Fifty semi-directive interviews, focus group discussions and observation with were conducted with the decision makers and cultural consultants in the Aeta community.
- A review and analysis of documents related to past risk management events for the issue was also conducted.
- Photoethnography was also used in this study and;
- Thematic content analysis was used to analyze transcripts and documents for key themes related to the research question.

The Aetas of Botolan Zambales

The Aetas are considered to be one of the first native settlers in the Philippines. According to one theory, the Aetas are descendants of the first settlers in the country some 300,000 years ago. Artifacts show that the Aetas once lived in the lowlands but gradually retreated to the hills and mountains when subsequent immigrants and conquerors pushed them into the forest.



NEGRITOS, THE ORIGINAL INHABITANTS OF THE PHILIPPINES.
FROM A PHOTOGRAPH.

The Aetas of Botolan Zambales



Some social scientists consider the Aetas of Mt. Pinatubo as the most important ethnic group because of their preserved cultural identity. It is estimated that more than 800,000 Aetas in the Philippines live in Mt. Pinatubo.

Prior to Mt. Pinatubo Eruption

The Aetas' economic and cultural life was rooted in their immediate environment, Mt. Pinatubo. Their activities such as hunting, fishing, and lowland and the upland (gahak or horticulture) farming depended on the resources around the volcano.





- Mt. Pinatubo erupted on June 15, 1991. The eruption produced high-speed lahar and ash fall across the community.
- The episodic eruptions of Mt. Pinatubo in Luzon in June 1991 were one of the major calamities that caught local and international attention.
- This disaster posed both negative and positive effects for the people of Botolan. Both the Aetas and residents in low-lying barangays were not spared from experiencing the effects of the catastrophe.

This is Botolan now...



BOTOLAN

BOTOLAN



After the eruption of Mt. Pinatubo these Aetas were resettled together with the lowlanders or the so-called the “unats” or straight haired community.



Mt. Pinatubo's eruption had a lasting effect on the lives of the Botolan Aetas: they find themselves highly susceptible to the threat of natural hazards and health risks.

Despite their evident vulnerabilities, the Aetas possess valuable indigenous knowledge, generated through practical and long-standing experiences, culture, and local resources, which they utilize in coping and ensuring their safety from the detrimental impacts of disasters.





Indigenous Knowledge Systems and Practices (IKSP)



What is Indigenous Knowledge System and Practices (IKSP)?

- [**Ancient**], traditional or local knowledge embedded in the community and is **unique** to a given culture, location or society (MOST-CIRAN, 2005).
- **User**-derived and not **scientist**-derived (Warren, 1994 in PHIRCSDIK-REPPIKA/IIRR, 1994:1)
- **Not western knowledge**





What is IKSP?

- ▶ Matured long-standing **traditions** and practices of certain **regional, indigenous**, or local **communities**.
- ▶ Encompasses the **wisdom**, knowledge, and teachings of these communities
- ▶ **Orally passed on** over generations from person to person
- ▶ Expressed through **stories, legends, folklore, rituals, songs**, and even **laws** or other means.



Categorization of IKSP?

1. **Health Practices** (health belief practices, maternal health care)
2. **Ethno-ecological practices** (identification and use of plants and animals)
3. **Resource management practices** (food collection, production and management practices)
4. **Ethno-history** (folklore, epics, creation myths, legends)



Categorization of IKSP?

5. **Ethnoarchaeology or Material culture** (crafts and products)
6. **Socio-political systems and institutions** (political structure, governance, dispute and conflict resolution, **customary law**)
7. **Ethnogeography** (geographical distribution of ethnic groups or peoples and the relationship between these groups and their environment)
8. **Ethnoclimatology** (climate change assessment and adaptation in mountain ecosystems)

Value of IKSP

1. Basis for local decision-making in communities (SciDev, 2005):

Education	local languages and oral traditions
Agriculture	crop biodiversity, intercropping, seed varieties, animal production and healthcare
Biology	ethnobotanical/pharmaceutical research; fish breeding techniques
Natural Resource Management	water management and forest/soil conservation techniques
Human Health Care	use of traditional medical knowledge and medicinal plant use
Disaster Risk Management	Pre-disaster signs; good practices, experiences and lessons learned; During and Post disasters

Value of IKSP

2. Considered a “**key element of the social capital of the poor**” since it is an asset toward ensuring survival through food production and providing for shelter, as well as for achieving control over people’s lives (IKPages, 2005)
3. **Way of life** *“If you don’t practice it, you’ll lose it.”*
4. IKSP was found to be an important **catalyst to disaster risk management** due to their direct connection of the Aetas to the physical environment or nature.



Value of IKSP

*However, these knowledge, systems
and practices
are at **escalating rate of deterioration**
due to consistent assimilation
that resulted from
the continuing loss of interest of these practices
from young people.*



IK is threatened by “politics of disappearance” by WK (Shiva, 1993):

- **Globalization:** transnational pharmaceutical industries, western medical technology, global health policies that are pro-West, biomed-focused/funded research and academic curriculum
- **Biodiversity Loss:** mining of biological resources (*biopiracy*)
- **Mainstreaming of IK:** mining/exploiting IK for profit and control (*commodification or commercialization of knowledge, de-indigenization, colonization of the mind, ethnocide/death of a culture*)



Status of IKSP in the Philippines



Status of IKSP in the Philippines

The decision-making and planning processes of the local government in the area of disaster risk reduction and management (DRRM) remain to be culturally insensitive to the Aeta's knowledge and context, putting the IPs in a more precarious condition, compromising their safety and health.

Aeta's on DRRM *(Disaster Risk Reduction and Management)*

- From the Spanish **CALAMIDAD** or **KALAMIDAD** in Tagalog language, meaning (**MISFORTUNE**)

NATURAL NA KALAMIDAD (**NATURAL CALAMITIES**)

DI NATURAL NA KALAMIDAD (**MAN-MADE CALAMITIES**)

- **KASAWIAN, KASAWIANG-PALAD, KAMALASAN** (**BAD LUCK**)

- **KASAMAANG-PALAD, KASAWIANG-PALAD** (**ADVERSITY**)



Aeta's on DRRM *(Disaster Risk Reduction and Management)*

Majority of the Aetas have been using indigenous knowledge (IKSP) forecasts to predict weather through observing the behavior of large animals, birds, plants, insects, and the solar system, which is not often being heard and documented by the local government.

IKSP on Forecasting on Disasters

Calamity	EARLY WARNING SIGNS	PREPAREDNESS
TYPHOON –Yolanda	Birds are not chirping and usually birds are hiding	Collecting firewoods, rootcrops and preparing their houses and their evacuation area on higher ground in case there's flood.
July, August and September	A halo around the moon predicts a bad weather will happen in three days	
	The presence of marching ants is believes to bring heavy rainfall	

IKSP on Forecasting on Disasters

Calamity	EARLY WARNING SIGNS	PREPAREDNESS
TYPHOON –Yolanda	High humidity and temperature	Collecting firewoods, rootcrops and preparing their houses and their evacuation area on higher ground in case there's flood. Others they stayed on the day center provided by the local government.
July, August and September	Dark clouds appearing in the indicates the prospect of rain	
	Strong winds without direction	

IKSP on Forecasting on Disasters

Calamity	EARLY WARNING SIGNS	PREPAREDNESS
MT. PINATUBO ERUPTION	High humidity and temperature	Collecting firewoods, rootcrops and preparing their houses and their evacuation area on higher ground in case there's flood. SOP They also bring 1 casserole per family
	The area is unusual very quite and calm, no birds in the area	
	Strong smell of the sulfur (<i>"pandaep nin sulfur"</i>)	

IKSP on Forecasting on Disasters

- Aetas are using their sense of smell as tool for survival.
- Prior to the 1991 Mt. Pinatubo eruption, the Aetas where able to smell the scent of the soil and also sulfur *pandaep nin asupre*.
- Informants said that even before the Philippine Institute of Volcanology and Seismology (PHILVOCS) raised the alarm for the Mt. Pinatubo eruption they already anticipated the eruption to happen.



IKSP on Forecasting on Disasters

- ▶ Until now the Aetas have continued to rely on indigenous knowledge (IKSP) to conserve.
- ▶ Aetas have generated a vast body of IKSP on disaster prevention through their early warning signs and preparedness.



Sadly, these knowledges were not considered or not being heard that resulted in health risks among the Aeta community.

IKSP on Forecasting on Disasters

Health Risks during disaster among the Aetas

➤ Resettlement areas / Evacuation Centers

The Aetas were encouraged to stay at the evacuation center instead of staying with their preferred area during disaster

Due to this, the Aetas' health were at risk:

Psychological, Emotional, Social, and Physical

Health Risks during disaster among the Aetas

➔ Food security needs inappropriate to their culture

Food prepared at the evacuation centers are not the food that they are used to eating in their original settlement (i.e. during the Mt Pinatubo eruption, the Aetas were given tons of sardines and noodle soup)

Due to this, some of the children suffered diarrhea and other illnesses.

Health Risks during disaster among the Aetas

► Proximity

The Aetas were not vaccinated therefore they do not have the immunity to the different diseases that may be an epidemic in an evacuation center (flu, measles, etc.)

The Aetas cannot freely and openly engage in their cultural practices, such as praying to Apo Namalyari, due to fear or social discrimination of the lowlanders or other groups witnessing their “unusual practice”

Aetas consider urination and defecation as social activities. Comfort rooms/toilets are unusual rooms for them, making them uncomfortable and the process unnatural.



Value of this IKSP

- This IKSP provides the necessary grassroots information, from the historic and cultural contexts, which helps in understanding how things work at the indigenous/local level
- It also creates better engagement with local people and better policies for the local government
- Provisions for documentation of IKSP should be made in the DRR literature, enabling more researchers to work harnessing such knowledge.

Recommendations

- The use of scientific and indigenous climate forecast information for the level decision making is recommended for addressing and coping with disasters.
- Consultation with the IP elders (older generations) who relied on IKSP to predict weather through observation and monitoring the behavior of animals, birds, plants and insects must be done. Through this, the establishment of **scientific weather forecasting becomes more culturally relevant**.

Recommendations

► Despite the benefits of weather forecasting using IKSP, it has its **challenges**:

1. lack of ***systematic documentation*** of the knowledge,
2. lack of ***coordinated research*** to investigate its accuracy and reliability,
3. lack of ***sustainability*** of the IKSP (i.e. when the elders who are the main custodians of the knowledge pass away, and transfer of knowledge to the younger generation is not accomplished, IKSP is lost).

Recommendations

- The provision of climate information services in the local government and also in the community must be ensured.
- There should be a weather forecasting team composed of a multistakeholder partnership that involves the local community and the indigenous groups



It is hoped that;

There is **knowledge integration** whereby the process of synthesizing multiple knowledge models (or representations) into a common model (representation) and the process of incorporating new information into a body of existing knowledge.

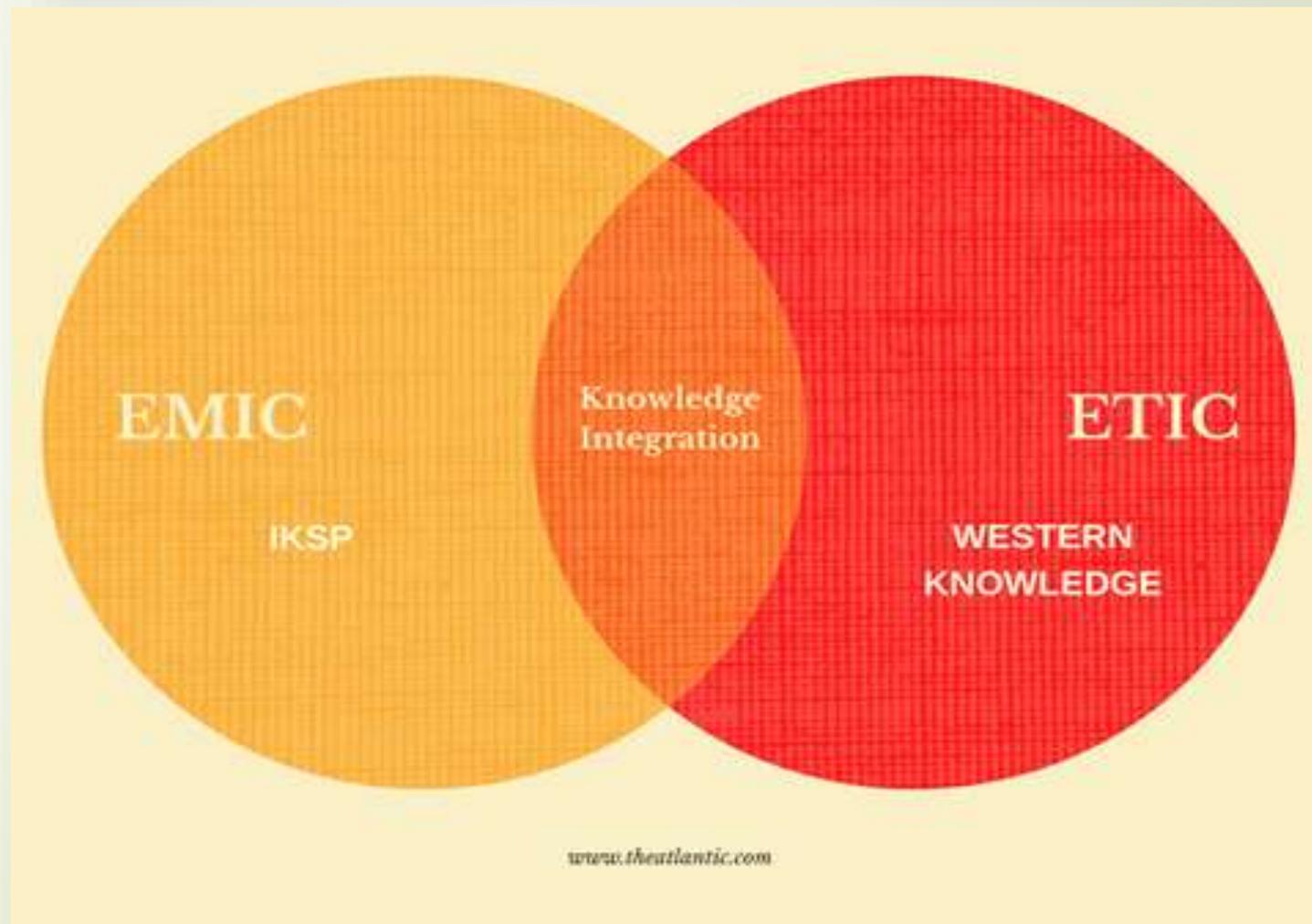


Such that...

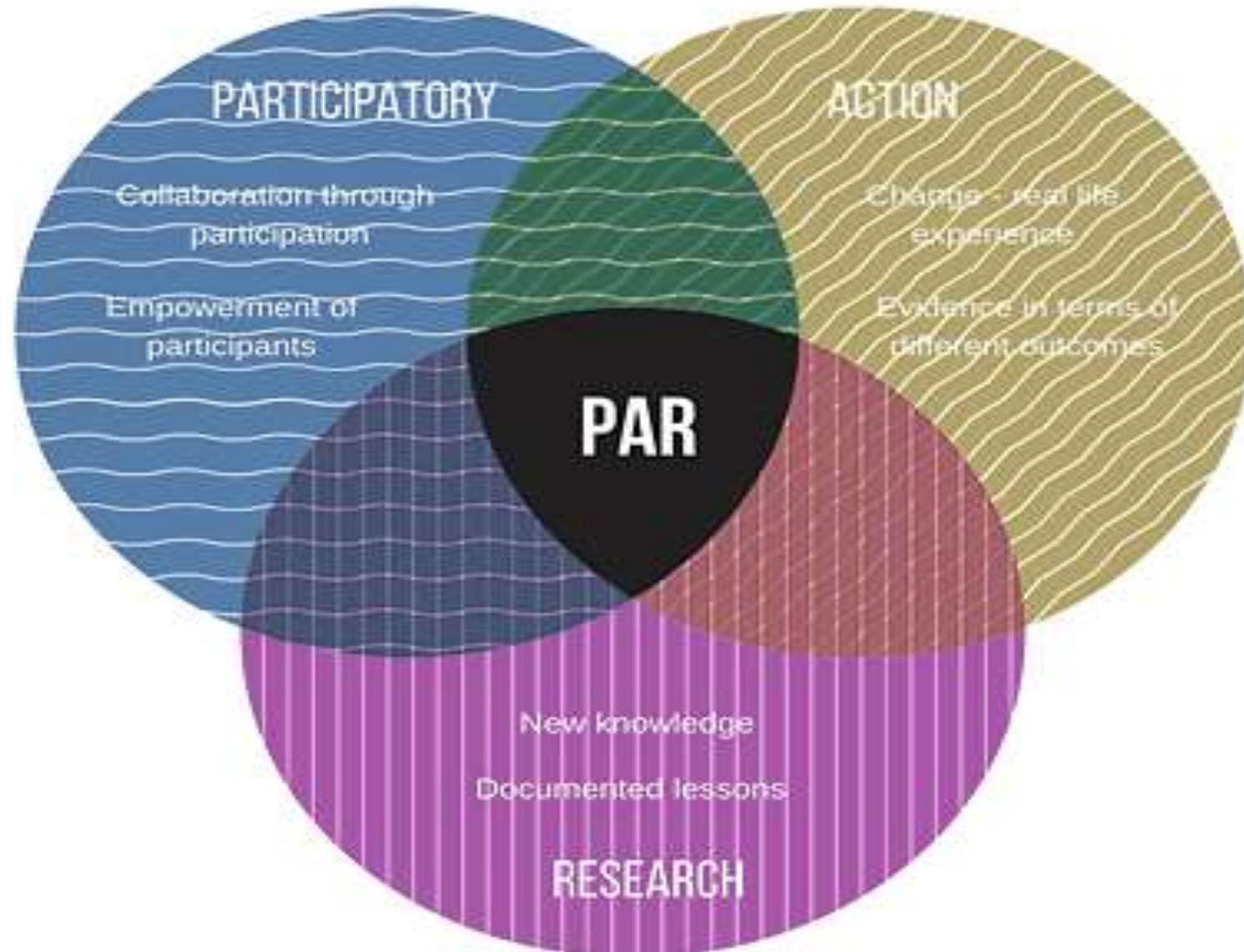
Knowledge integration

is the thoughtful, culturally respectful,
and equitable process
of employing simultaneously
two or more knowledge systems
to understand and address
the disaster and health risk management

Employing ethnographic and participatory methods



Participatory Action Research



The First Aeta who graduated at UP Manila, Department of Behavioral Sciences

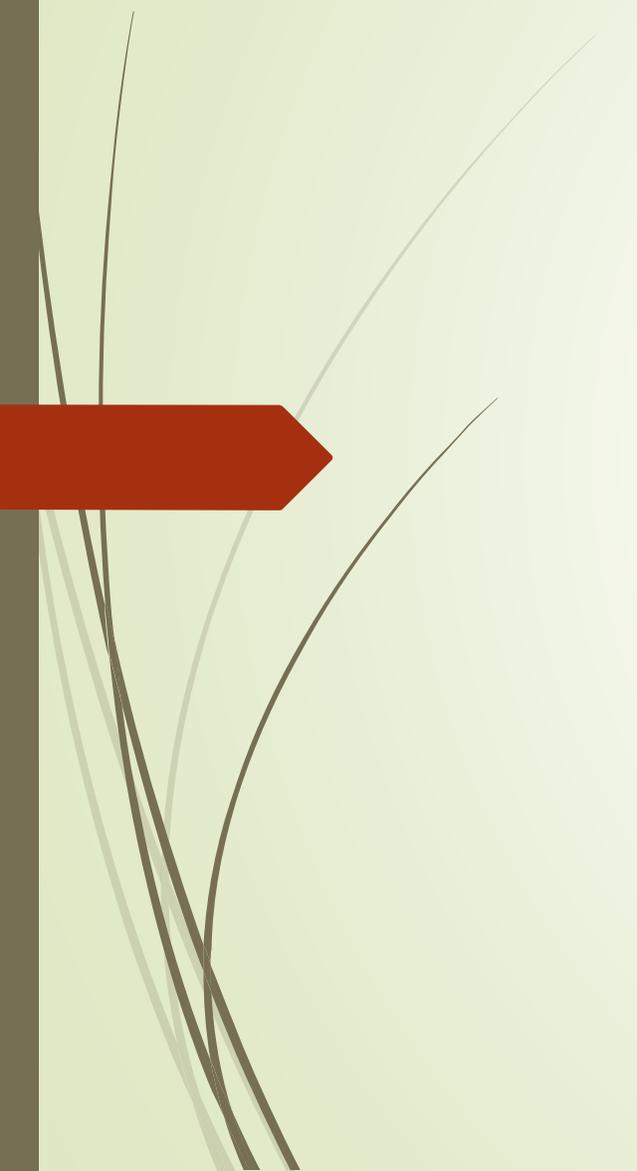




Ecocentrism/Sustainable Ecosystems Approach

***“Ang Tao at ang Kalikasan ay lisa,
ang aming Karanasan at Kaalaman
ang Istorya na magbabago sa Sangkatauhan.”***

*[Man and Nature are One,
our Experience and Knowledge
is the Story that will change Humanity.]*



Maraming Salamat po



Integrating the Indigenous Knowledge Systems and Practices (IKSP) on Disaster Risk Management and Health Risk Reduction

Ma. Teresa G. de Guzman, PhD

University of the Philippines, Manila