

Manila Observatory - Tonichi Regalado
**Creating Markers for Detecting NELD in Coastal Communities in the
Philippines (La Union)**
March 2024

Short Summary of Research Initiative:

- This research initiative, under the Manila Observatory, has the express goal of identifying elements of Non-Economic Loss and Damage (NELD) from coastal communities - in this particular case, certain areas of the northern province of La Union in the Philippines.
- Through controlled focus group discussions (FGD) with fisherfolk, a qualitative data set was collected and put through review to bridge the very wide knowledge gap in NELD research in the Philippines i.e. a findings paper.

BACKGROUND and RATIONALE:

Climate Vulnerable La Union

According to the Manila Observatory's (MO) Panahon Platform¹, Northwestern Luzon or particularly the Ilocos Region, in a moderate emissions scenario (RCP4.5), will achieve the highest rainfall change in the next 40 years. The area itself is expected to experience approximately 300mm² more rain within that time frame. Increased rainfall in the region will undoubtedly induce upland erosion which reduces water quality as sediment settles on shallow coastal areas. Salinity fluctuations³ caused by extreme rainfall may likewise shift marine species farther offshore. Both scenarios greatly affect those in the area whose livelihoods are dependent on the water e.g. surfers and fisherfolk.

Climate shocks generally impact coastal areas disproportionately, much less those in the Philippines. La Union's (LU) coastal towns are constantly exposed to hydrometeorological risks such as flooding, rain-induced landslides, and tension cracks brought on by powerful typhoons⁴ and rising sea levels.

The locals in North Luzon trace their climate vulnerability to the July 1990 earthquake that devastated and caved in key pieces of land in the region. This left seaside

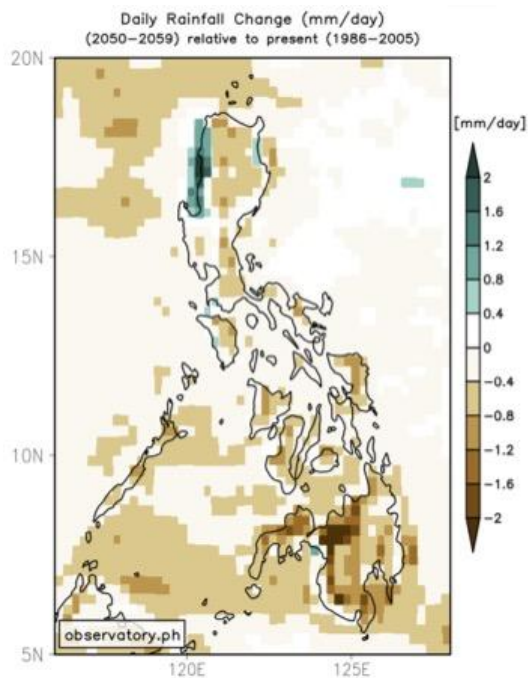
¹ "Manila Observatory - Panahon: Climate Anomalies", <https://panahon.observatory.ph/climate>

² DOST-PAGASA, Manila Observatory, and Ateneo de Manila University. (2021). Philippine Climate Extremes Report 2020.

³ Id.

⁴ Provincial Government of La Union, La Union Central Circuit, June, 2019, <https://launion.gov.ph/la-union-circuits/central-circuit/>

communities particularly climate vulnerable. In 2011, the Mines and Geosciences Bureau's Marine Geological Survey Division (MGS) examined La Union's coastline for coastal geohazards. It was revealed that the coastal barangays in the province are predisposed to coastal erosion, storm surge, tsunami, and coastal flooding.



*Mean change for each decade, at RCP 4.5 scenario
calculated from an ensemble of 5 regional climate models
Fig. 1: RCP 4.5 Scenario - Manila Observatory
Panahon Platform

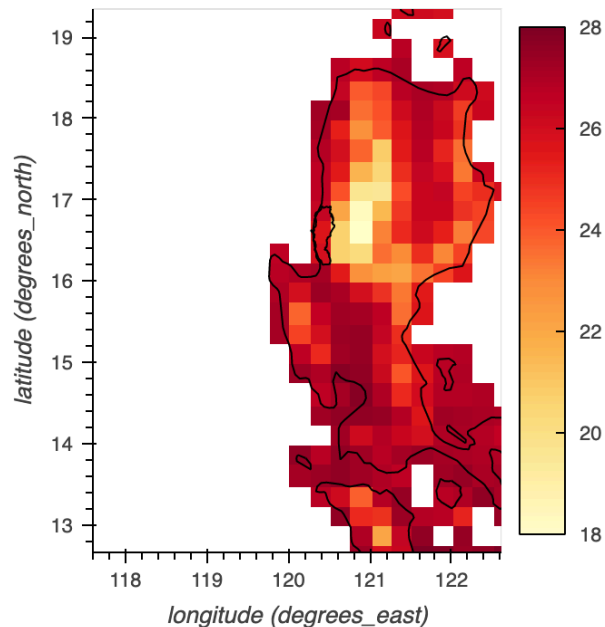


Fig. 2: Decadal Average Temperature
(2011-2015) - Regional Climate Systems
Laboratory - MO

Liquefaction, a condition in which soil loses its strength in the face of a stressor like the 1990 earthquake, was also found to be a contributing factor to coastal vulnerability in the area. The coastal areas of La Union, especially Aringay and Agoos⁵ are typically covered with loose sand and so are easily reclaimed by waves during typhoons and *habagat* (southwest monsoon) seasons. Added to the looming threat of sea level rise (SLR), La Union faces unpredictable climate impacts bound for the Philippines.

⁵ Vanishing Brgy. Alaska: Who's paying for loss and damage?. Rappler.
<https://www.rappler.com/environment/191288-brgy-alaska-la-union-climate-change-loss-and-damage/>.
December 2017

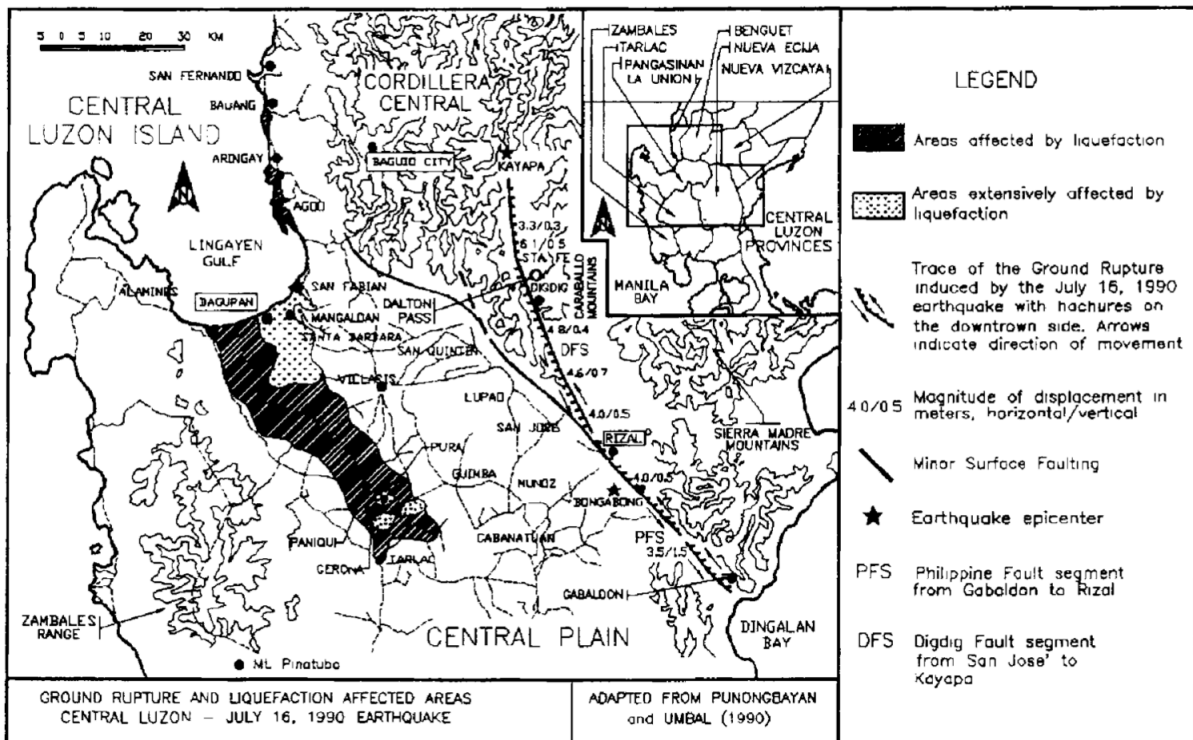


Fig. 3: Overview of Luzon 1990 earthquake area, adapted from Punongbayan and Umbal (1990).

In part because of the influence of the trade winds pushing ocean currents, the water levels surrounding the Philippines are rising at a rate that is almost three times faster than the global average. Sea levels worldwide rise by 3.1 centimeters on average every ten years.⁶ The Philippines' water levels are expected to rise by 7.6 to 10.2 centimeters per ten years. SLR has definitely been taken into account by the Philippine government, and to address the issue, a number of public and private organizations have emerged in recent years. The Climate Change Commission (CCC) projects within the Department of Environment and Natural Resources have developed a number of initiatives to inform populations in high-risk areas.⁷ One program, for instance, specifically trains coastal communities on how to adapt to increasing sea levels. Eventually, however, local adaptability won't be sufficient, so governments must be persuaded by policymakers to reduce their emissions globally while at the same time executing a balancing act for loss and damage (L&D) for the consequences that go beyond adaptation.

⁶ International Development Research Centre (IDRC). "Parts of Philippines may submerge due to global warming." ScienceDaily. ScienceDaily, 21 October 2015. <www.sciencedaily.com/releases/2015/10/151021104913.htm>.

⁷ *Id.*

Non-Economic Loss and Damage (NELD) Knowledge Gaps

L&D from extreme weather events like typhoons and heat waves are commonplace in the Philippines, as are slow-onset impacts like sea level rise, desertification, and degradation, ocean acidification, and salinization. Coastal communities are especially vulnerable to L&D when faced with challenges that exceed their capacity for adaptation⁸, whether as a result of a lack of funding for adaptation efforts or a lack of workable solutions. This further damage can be categorized into **economic losses** and **non-economic losses**, although there is some overlap between the two.

Economic losses refer to the impact on resources, goods, and services that are commonly traded in markets. This includes damage to critical infrastructure, property, and disruptions in the supply chain. These losses can occur on both national and local scales, driving poverty incidence in fishing communities even higher; small-scale fisherfolks in the Philippines are among the poorest of the poor, and they depend on the fishery resource for subsistence.

Box 1. What is non-economic loss and damage?

Non-economic losses and damages caused by climate change include a wide range of impacts not easily quantified in monetary terms. Examples include:

1. Loss of cultural heritage. Climate change can threaten traditional ways of life, including Indigenous cultures, and lead to the loss of important cultural practices, artifacts, and languages.

2. Loss of traditional knowledge and practices. As communities are forced to adapt to new conditions or migrate to new areas, there can be a significant impact on cultural identity.

3. Mental and physical ill health. Direct physical health impacts include more heat-related illnesses, respiratory problems caused by air pollution, and the spread of infectious diseases. The stresses and uncertainties related to climate change can also trigger significant mental health issues, including anxiety, depression and post-traumatic stress disorder.

4. Social disruption. Including conflict and migration, as people are forced to leave their homes by rising sea levels or other climate-related impacts.

5. Loss of biodiversity. Climate change can lead to the extinction of some species, as well as shifts in the distribution and abundance of others. This in turn affects ecosystems and the services they provide, such as pollination and pest control.

Fig. 4: Examples of Non-Economic Loss and Damage from Bharadwaj, Huq, and Mitchell (2023).

Non-economic losses, on the other hand, can be the most devastating. These losses are difficult to measure but have profound effects on individuals and communities. They include the immeasurable toll of losing loved ones, the disappearance of cultures and ways of life, and the trauma of being displaced from ancestral homes - a situation that the Philippines is unfortunately all too familiar with.

⁸ Bandhari, Preeti, N. Warszawski, D. Cogan, and R. Gerholt. "What is "Loss and Damage" from Climate Change? 6 Key Questions Answered." 06 April 2022. World Resources Institute. <https://www.wri.org/insights/loss-damage-climate-change>

While NELD are harder to quantify and assign a monetary value to, their effects on the well-being of communities are severe and detrimental.

Fisherfolk and Coastal La Union

NELD consequences extend far beyond abstract concepts, impacting the lives and livelihoods of real people. In the coastal province of La Union, these effects resonate strongly among the local fisherfolk community. These resilient individuals rely heavily on the abundance of the sea for their sustenance and economic well-being. However, SLR, ocean acidification, and extreme weather events have taken a toll on their way of life. As marine ecosystems are disrupted, so too are the lives of those who protect it. Faced with dwindling catches, reduced incomes, and heightened uncertainty about their future,⁹ some fisherfolk in La Union have been forced to adapt beyond their capabilities.



Fig. 5: In Brgy. Paringao in Bauang, La Union, fishermen describe how far out the shoreline used to be

Fisherfolk catch fish so they can buy rice for their family. With limited financial capital, most of them get loans to buy fuel and ice before heading out to the sea. It's been well-documented that pressures from disaster-vulnerable livelihoods leads to reduced family income, displacement, parental absence, and likely migration of families to

⁹ World Bank Group. 2022. Philippines Country Climate and Development Report. CCDR Series;. © World Bank, Washington, DC. <http://hdl.handle.net/10986/38280> License: CC BY-NC-ND.

informal settlements¹⁰. Limited and even forced human mobility is a staple of NELD, not to mention the actual risk of life whenever fishermen venture out for their daily catch.

Traditional methods of fishing also face the possibility of fading away with time. The Bureau of Fisheries and Aquatic Resources (BFAR)¹¹, is expecting a 9% to 24% decline in potential marine fisheries yield within the Philippines' exclusive economic zone (EEZ) by 2050 due to climate change. Additionally, 59 marine species will experience reductions in habitat suitability owing to changes in salinity and rising sea temperatures. This indicates that area-specific methods of fishing will have to adapt and eventually change wholesale to accommodate the changing types of fish and changes to the coastal environment.



Fig. 6: Different types of Fishbait in Brgy. Paringao in Bauang, La Union

The intimate link between L&D and the livelihoods of fisherfolk in La Union serves as a poignant reminder of the pressing necessity to anticipate and address the impacts arising from both slow onset events and sudden climate shocks. Furthermore, it highlights the importance of safeguarding the day-to-day existence of coastal communities. In the province of LU, fishing not only serves as a vital means of sustenance but is also intertwined with other aquatic activities such as swimming and diving.

Communities and Loss in the Long Run

Considering how La Union is a designated cultural hotspot in Luzon, it presents a timely location for an initial stab at NELD research and impacts. These impacts are particularly hard to quantify¹² since they deal in, among others, cultural heritage,

¹⁰ *Id.*

¹¹ Geronimo, R.C. 2018. "Projected climate change impacts on Philippine marine fish distributions." Quezon City: Department of Agriculture, Bureau of Fisheries and Aquatic Resources.

¹² Huq, S, T. Mitchell, and R. Barharadwaj. (2023). *Non-economic loss and damage: closing the knowledge gap*. International Centre for Climate Change and Development (ICCCAD).

biodiversity, and human mobility. They can have long-term and intergenerational impacts, affecting the well-being, resilience, and development of communities and societies.

In January of 2018, the House of Representatives approved on the third and final reading the House Bill 6683¹³, which declared the province of La Union a tourist destination and “Surfing Capital of the North.” This implementation included construction and maintenance of facilities, funding, and security. The opening of a TPLEX (Tarlac-Pangasinan-La Union Expressway) exit around Pangasinan in April 2014 drastically reduced travel time from Metro Manila to the area by around two hours. This surge in activity has prompted communities and even local state universities to bolster their conservation efforts in the area in cooperation with the national government¹⁴.

APPROACH and METHODOLOGY:

Primary data for this case study was sourced from site visits, key informant interviews, and focus group discussions (FGD). Fieldwork for the study was conducted between April to May 2023 in the Philippine coastal province of La Union. Study informants were selected upon the recommendation of the local state university; Don Mariano Marcos Memorial State University (DMMMSU)’s Environmental Management Office.

An earlier study by Visayas State University (VSU) and Institute for Climate and Sustainable Cities (ICSC) on the impacts of climate change slow onset events¹⁵ in small island ecosystems in Visayas puts forth a reliable base for FGDs in coastal areas. They concentrated on the following in their Key Informant Interviews (KII):

- Source of Income of the Respondents
- Major Issues and Concerns in Coastal and Small Island Communities
 - Local Community Residents
 - Local Government Officials
- Knowledge and Awareness of Local People
 - Local People in Communities
 - Local Government Officials

¹³ House OKs bill declaring La Union the “Surfing Capital” of the North, Erwin Colcol, GMA News, <https://www.gmanetwork.com/news/lifestyle/travel/638364/house-oks-bill-declaring-la-union-the-Isquo-surfing-capital-of-the-north-rsquo/story/>, January 2018.

¹⁴ DMMMSU Celebrates National Wetlands Day 2023. Maricon Viduya. <https://www.dmmmsu.edu.ph/>

¹⁵ Mangaoang, E, H. Montes, S. Cesar, and K. Fiecas (2018). Impacts of Climate Change Slow-Onset Events of Sea Level Rise, Increasing Sea Surface Temperature, and Ocean Acidification in Coastal Fishery Areas and Small Island Ecosystems in Visayas, Philippines. Visayas State University and Institute for Climate and Sustainable Cities. <https://icsc.ngo/portfolio-items/impacts-of-soe-in-ev>

Table 4. Informants' perceptions of climate change, SLR, ISST, and OA, October 2018.

Study Site/Concept	Knowledge and Awareness
Guiuan, Eastern Samar	
Climate change	Changing weather patterns Extreme events Stronger typhoons
Slow-onset events	No knowledge Does not understand New term encountered
Sea level rise	Increase in normal sea water level due to climate change Rising and lowering of sea level Sea water intrusion to communities
Increasing sea surface temperature	Caused by ozone depletion Causes coral bleaching Increase in global temperature, causing increased sea water temperature Exerts negative effects on fishing
Ocean acidification (OA)	No knowledge and understanding Caused by sea water pollution
Santa Fe, Bantayan Island	
Climate change	Changing weather patterns Extreme events Stronger typhoons
Slow-onset events	No knowledge and understanding
Sea level rise	Increased sea water level due to climate change
Increasing sea surface temperature	Caused by global warming due to ozone depletion Caused coral bleaching
Ocean acidification (OA)	No understanding

Fig. 3: Narrative Findings Sample - Visayas State University and ICSC: Impacts of Climate Change Slow-Onset Events of Sea Level Rise, Increasing Sea Surface Temperature, and Ocean Acidification in Coastal Fishery Areas and Small Island Ecosystems in Visayas, Philippines, 2018

These would serve as decent guidelines in directing our questions on their concerns with La Union's climate future. The key questions from the Manila Observatory's 2022 work in the islands off the coast of the island province of Bohol¹⁶ also offers a Q&A framework for this research, albeit it needed to be more contextualized to fit the experience of fisherfolk in La Union.

Observed negative impacts of climate change and existing adaptive capacity.

- What are the individual and collective negative impacts of climate change on the community?
 - What are the individual and collective negative impacts of chronic tidal flooding on the community?
 - What are the individual and collective negative impacts of recent flooding or typhoons to the community?
- What are the existing adaptive capacities of the community?
 - What specific adaptation strategies has the individual/household/community implemented in recent years?

¹⁶ Loss and Damage: Perspectives from Southeast Asia. 2022.
<https://www.observatory.ph/publications/loss-and-damage-perspectives-from-southeast-asia/>

- What specific recovery strategies do they think will need to be implemented in the coming years?

Based on the issues and concerns pointed out by the fisherfolk regarding climate change around their environment and livelihood, NELD are identified. The Executive Committee of the Warsaw International Mechanism for Loss and Damage (WIM ExCom) divides NELD into:

1. Environmental degradation/loss of ecosystem services
2. Loss of territory and related losses
3. Loss of cultural heritage

After identifying the fisherfolks' issues and concerns, the community was consulted on "markers that go beyond adaptation."

FINDINGS OF THE STUDY (INITIAL SCOPING):

Issues and Concerns in Coastal La Union (Fisherfolk)

The issues and concerns raised by subjects in the engaged communities are

Subject/ Study Site Example: fisherfolk	Issues and Concerns	Marker that goes beyond adaptation
Fisherfolk - Brgy. Paringao, (BAUANG)	Rising Sea-Level	<ol style="list-style-type: none"> a. The time it takes to go out to sea to fish. b. The demolishing of a seawall was mentioned which the fisherfolk attribute to the approaching coastline.
	Coral Bleaching	<ol style="list-style-type: none"> a. Complete discoloration of corals.
	Rising Sea-Surface Temperature	<ol style="list-style-type: none"> a. The time it takes to go out to sea to fish - note: fish have been going farther to stay in colder waters.

	Human Mobility	<p>a. Sinking Barangay - properties swallowed by the ocean.</p> <p>b. Relocation; for safety and for livelihood.</p>
Fisherfolk - Brgy. Pilar, (BAUANG)	Rising Sea-Level	a. Clear narratives on how far the sea has encroached on properties.
	Rising Surface Temperature (Land)	a. Narratives on how the fisherfolks schedule their hauls at earlier times, not to anticipate the catch, but to avoid the harsher heat during their loading/unloading.
	Human Mobility	a. Houses and settlements used to be movable (<i>kubo kubo</i>). However, houses are now made of concrete - concerns are growing now that they will not be able to relocate their settlements.
Brgy. Dulao, Aringay, La Union	Adjusting to Saltwater Intrusion	<p>a. Brgy. Dulao used to be called the “Coconut Village” until the coconut trees died of sun disease and saltwater intrusion.</p> <p>b. There used to be a healthier shrimp</p>

		<p>harvest; some of the locals have abandoned shrimp farming due to their stunted growth (saltier water).</p> <p>c. Saltwater has destroyed rice framing.</p>
	<p>Rising Water Temperatures (effect on Fish Ponds and Mangrove Farming)</p>	<p>a. According to the fisherfolk, the rising water temperatures have increased low tide and affected the health of the fish catch.</p> <p>b. The fish culture used to be <i>hito</i> (catfish) and tilapia. Now it's <i>bangus</i> (milkfish) and <i>hipon</i> (shrimp)</p> <p>c. Recently, the fisherfolk noted that from the usual 3-month growing period of the <i>bangus</i>, it now takes 8-9 months because of overcrowding.</p>

Conclusions and Recommendations for Next Phasere

The essence of this case study was to create optimal markers and methods for detecting NELD in coastal communities in the Philippines. Given the predominant fisheries industry in these areas, consulting fisherfolk was essential to understand the impacts of climate change on both their local ecosystem and means of living.

After the initial assessment, the fisherfolk confirmed what aspects of their shared issues went beyond what they believed were their capacity to adapt. The findings of

the case study indicate that for coastal provinces like La Union, these markers would most likely be:

- Increased time to fulfill livelihood obligations (e.g. the time it takes to go out to sea to fish)
- Changing of resources in farmed fisheries (e.g. changes in fish culture and growth periods)
- Clearly agreed narratives within the community on how far the sea has encroached on certain properties.
- Relocation for livelihood.

These indicators are intended to act as reference points for researchers, and to enhance the robustness of these findings, this case study ought to be replicated across the majority, if not all, coastal regions within this province. This would bolster the foundation of these identification indicators. Moreover, if feasible, replication in other coastal provinces throughout the Philippines would further strengthen the study's reliability and applicability.

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