

CEED

SEAS AT A BOILING POINT

Assessing El Niño Impacts on Philippine Seas and Coastal Communities

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After extreme heat waves swept through the Philippines during the 2023 to 2024 El Niño phenomenon, the Philippines is bracing once again for a "Super" El Niño that is currently intensifying in the tropical Pacific and is likely to persist until the early months of 2027. The widespread disruption and severe impacts of the 2023-2024 El Niño event is illustrative of what United Nations Secretary-General Antonio Guterres stated in July 2023, "the era of global climate warming has ended, the era of global boiling has arrived." This briefer delves into the effects of an El Niño intensified by the climate crisis on marine biodiversity, fisheries, and coastal communities in the Philippines.

This report is available at https://ceedphilippines.com.

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OVERVIEW AND KEY FINDINGS

This report examines the impacts of the 2024 El Niño phenomenon in the Philippines and the potential impacts of the currently developing 2026/2027 Super El Niño, with a particular focus of its implications on Philippine marine biodiversity and coastal communities. The report highlights how El Niño, in the context of the climate crisis, disrupts typical global weather patterns, contributing to extreme heat, prolonged droughts, and other climate-related hazards. These disruptions pose significant threats to agriculture, water resources, public health, and marine ecosystems. Key findings from the report include:

El Niño Intensifies Climate Hazards

The Philippines remains at the forefront of worsening climate and disaster risks. In the 2026 WorldRiskIndex, the country ranked first among 193 countries with a risk score of 46.69, once again placing the Philippines at the top of the global disaster-risk ranking. Over the years, the country has faced devastating climate-related disasters, with the El Niño phenomenon exacerbating and further compounding the risks and impacts experienced by communities.

Extreme Heat is 'Boiling' Our Seas and Disrupting Livelihoods

Rising temperatures are causing serious damage to our lands and seas. In recent years, El Niño events have intensified coral bleaching across the country's reefs which resulted in substantial coral cover loss and threatens the diversity and resilience of coastal and marine ecosystems. Changes in seawater temperature have also altered fish distribution and contributed to declining fish stocks. These impacts place additional pressure on fisheries, food security and the livelihoods of coastal communities that depend on marine resources for sustenance and income which further deepen existing socioeconomic vulnerabilities.

Coastal Communities Facing the Brunt of the Climate Crisis

Along with declining fish catches and increasing health risks from soaring temperatures, fisherfolk and coastal communities faced difficult challenges during El Niño. To address these issues, holistic strategies are essential, including a community-centered approach that provides coastal communities improved access to climate finance, enhanced promotion of nature-based solutions, building and upgrading critical infrastructures, and establishing more Marine Protected Areas. Most importantly, traditional knowledge needs to be recognized and valued to encourage participation of local communities. This is crucial to ensuring that solutions are grounded in local realities and truly answer the needs of the people on the ground.

The report recommends that we promote nature-based solutions to protect and restore the environment and foster climate resilience in the Philippines. A ridge-to-reef approach in conservation can help alleviate the droughts that El Niño brings. Apart from these, the expansion of marine protected areas can provide numerous ecological and socioeconomic benefits, especially to fisherfolk communities.

Furthermore, the implementation and enhancement of the National Action Plan on El Niño and the National Climate Change Action Plan could further mitigate the risks of disasters and bolster the resilience of the general public. As a key solution to address worsening climate impacts, the Philippines must champion renewable energy in the country to reduce greenhouse gas emissions and advocate inclusive consumption of energy, especially in areas that do not have access to electricity.

I. INTRODUCTION

The Philippines has experienced a long-term warming trend with PAGASA records showing an increase of the country's mean atmospheric temperature of 0.648°C between 1951 to 2010, equivalent to approximately 0.11°C per decade.[1] In 2024, the Philippines experienced one of its warmest temperatures in history[2] with a record-breaking 40.3 °C recorded in the province of Tarlac and a 53°C Heat Index high in Iba, Zambales[3]. Multiple regions across the country also experienced heat-index levels classified as "Dangerous" (42-51°C) and in some locations "Extremely Dangerous" (52°C and above) heat indices, particularly during the hottest months of the year. The effects of extreme temperatures were felt across all sectors resulting to a rising trend of heat-related illnesses[4], onsite class suspensions[5], and billions of pesos worth of loss in agricultural production[6].

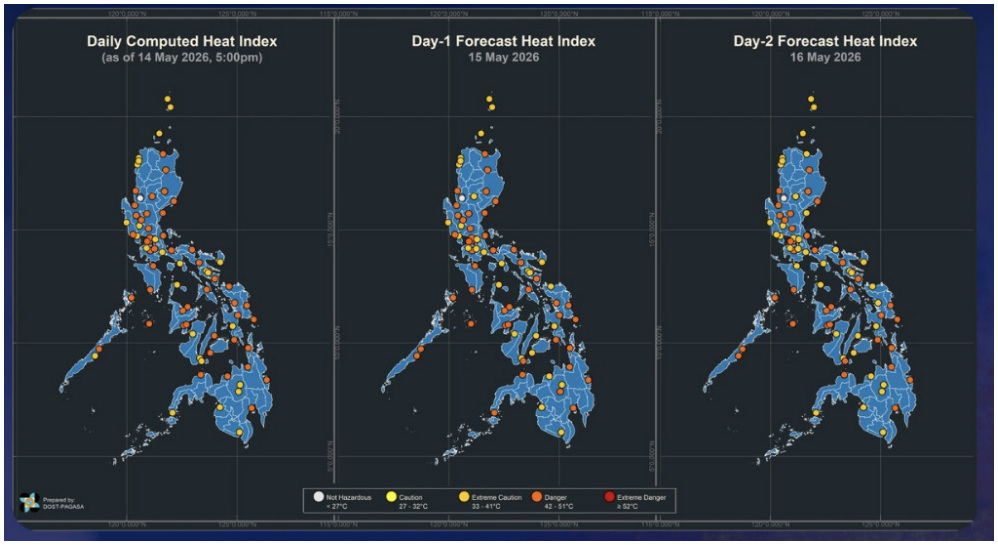


Figure 1. Daily computed index (May 14, 2026) and forecast heat index (May 15-16, 2026), one of the hottest months in the Philippines. Source: DOST-PAGASA (2026, May 14-15)

Anthropogenic activities that emit greenhouse gases are seen as the primary driver for global warming while El Niño can exacerbate these near-term heat and drought risks. As of September 2026, PAGASA reported an intensifying El Niño in the tropical Pacific and forecasts that it would develop into a very strong El Niño between September and December 2026, persisting until the first half of 2027.[7]

El Niño is the irregular warming of sea surface temperatures in the equatorial Pacific Ocean that causes disruptions in atmospheric circulation that result in abnormalities in temperature, extreme weather events, changes to weather, and rainfall patterns. These cyclical effects typically happen at consistent intervals, lasting anywhere from a few months to over a year. However, studies indicate that El Niño events could potentially happen earlier, become more intense at a faster rate, and last for longer periods in the future as a result of the climate crisis.[8] This year's 2026/2027 Super El Niño is expected to dominate global patterns, with the Philippines identified as one of the countries that will be hardest hit among ASEAN countries.[9]

1 PAGASA. Climate Change in the Philippines, Current Climate and Observed Trends, Current Climate Trends in the Philippines (n.d.). https://www.pagasa.dost.gov.ph/information/climate-change-in-the-philippines

2 2024 is hottest year in Philippines: PAGASA. (January 2025). ABS-CBN. https://www.abs-cbn.com/news/weather-traffic/2025/1/23/2024-is-hottest-year-in-philippines-pagasa-1717

3 Zambales reaches 'extreme danger' heat index of 53°C (April 2024). Philippine News Agency. https://www.pna.gov.ph/articles/1223601

4 DOH warns Filipinos against heat stroke.(April 2024). Philippine News Agency. https://www.pna.gov.ph/articles/1221899

5 Consider F2F class suspension amid extreme heat, task force asks LGUs. (April 2024). Philippine News Agency. https://www.pna.gov.ph/articles/1221816

6 Agriculture losses due to El Niño reach P9.5 billion. (May 2024). Philippine Star. https://www.philstar.com/headlines/2024/05/21/2356847/agriculture-losses-due-el-nio-reach-p95-billion

7 PH braces for severe El Niño seen to last until 2027. (2026, August 7) Inquirer.net https://newsinfo.inquirer.net/2250817/ph-braces-for-severe-el-nino-seen-to-last-until-2027

8 Lopez, H., Lee, SK., Kim, D. *et al.* Projections of faster onset and slower decay of El Niño in the 21st century. *Nat Commun* 13, 1915 (2022). https://doi.org/10.1038/s41467-022-29519-7

9 'Philippines most vulnerable in ASEAN to El Niño'.(2026, August 5) Philippine Star. https://www.philstar.com/business/2026/08/05/2546972/philippines-most-vulnerable-asean-el-nino

This development is of grave concern as the Philippines has yet to fully recover from the previous 2024 El Niño event were an estimated PHP 9.89 billion worth of total damage was reported for the agricultural sector - with PHP 57.72 million damage to the fisheries sector, PHP 4.75 billion attributed to rice production, PHP 3.37 billion to corn, and PHP 1.7 billion to high-value crops[10] surpassing the damages incurred in the preceding 2019 El Niño. The 2019 El Niño event impacted 247,610 farmers and fisherfolk and 227,889 hectares of agricultural land across the Philippines.

Task Force El Niño, a body reactivated by President Marcos Jr. to revise, update, and implement solutions under the Strategic El Niño National Action Plan[11], anticipates that approximately 700,000 metric tonnes worth of rice production could be lost during this 2026/2027 El Niño event[12]. As of October 14, 2026, the National Disaster Risk Reduction and Management Council (NDRRMC) reported nearly ⊠6.5 billion in agricultural damage across 10 regions but the economic consequences could be even greater.[13] An economic analysis estimates that the 2026/2027 El Niño could result in ₱286.8 billion in nationwide direct and indirect losses which includes ₱77.8 billion in direct losses from crop failures and declining fish catch, and ₱209 billion in indirect losses arising from unemployment, disrupted supply chain and inflation pressures.[14]

Water scarcity is also a threat as El Niño significantly reduces rainfall, exacerbating the already existing water crisis in many urban centers in the Philippines like Metro Manila. In April 2024, more than 432 cities and municipalities from different regions across the country declared a state of calamity, with Cebu and Zamboanga cities facing a water crisis.[15] Despite these, on April 8 of the same year, President Marcos Jr. expressed reluctance to declare a National State of Calamity, stating that a one-size-fits-all approach may not be suitable for all areas affected by El Niño.[16]

Months of consistently high heat index records also saw communities across the Philippines grapple with service failures of energy facilities[17] and water infrastructures[18]. These only added to already pressing health risks for vulnerable populations. From January to May 4, 2024, records of heat-related illnesses, including heat stroke and heat exhaustion have reached 77[19] with 7 deaths reported. According to the Department of Health (DOH), however, the cause of these incidents cannot be definitively determined due to insufficient data.[20] A study by Climate Impact Lab of the University of Chicago reports that an estimated 6,500 additional heat-related deaths could be expected in the country during the El Niño months[21].

The gravity of the El Niño phenomenon and its lingering impacts cannot be underscored. This report seeks to contribute to this discourse by honing in on the specific impacts of El Niño on Philippine seas, its marine biodiversity, coastal communities, and in the exacerbation of these impacts in the context of the climate crisis. The paper also offers recommendations on responding to the climate crisis and strengthening the resilience and adaptive capacity of marine ecosystems and coastal communities.

10 Cariaso, B. (2024c, June 10). DA: El Niño agriculture damage balloons to P9.89 billion. Philstar.com. https://www.philstar.com/business/2024/06/11/2361854/da-el-nio-agriculture-damage-balloons-top989-billion

11 Reactivating and Reconstituting the Task Force El Niño, and for Other Purposes, Executive Order No. 53, [January 19, 2024] https://pco.gov.ph/news_releases/executive-order-no-53-reactivating-and-reconstituting-the-task-force-el-nino-and-for-other-purposes/

12 Reyes, J. (2026, May 29). DA revives El Niño task force as weather threatens rice output. Daily Tribune. https://tribune.net.ph/2026/05/29/da-revives-el-ni%C3%B1o-task-force-as-weather-threatens-rice-output

13 Philippine News Agency. (2026, October 14). Agri damage in 10 regions due to El Niño now at P6.5-B – NDRRMC. Philippine News Agency. https://pna.gov.ph/article/agri-damage-in-10-regions-due-to-el-nino-now-at-p65-b-ndrrmc

14 Mendoza, D. T. P. (2026, May). Super El Niño could hit regions differently, study warns. INQUIRER.Net. https://newsinfo.inquirer.net/2234585/super-el-nino-could-hit-regions-differently-study-warns

15 Cabreza, V. (2024, April 6). Water lack now 'public safety issue' in Zamboanga City. Inquirer.net. https://newsinfo.inquirer.net/1926798/water-lack-now-public-safety-issue-in-zamboanga-city

16 Esguerra, D. J. (2024, April 8). PBBM: No need for nationwide state of calamity over El Niño. Philippine News Agency. https://www.pna.gov.ph/articles/1222231

17 Perez, A. (2024, March 7). Water supply in Metro Cebu starts to dwindle due to El Niño. ABS-CBN News. https://news.abs-cbn.com/news/2024/3/7/water-supply-in-metro-cebu-dwindling-due-to-el-ni-o-851; see Footnote 13

18 Elchico, A. (2024, May 29). Power situation now a "calamity" says DOE. ABS-CBN News. https://news.abs-cbn.com/business/2024/4/25/power-situation-now-a-calamity-says-doe-1554

19 GMA Integrated News. (2024). Heat-related illness cases rise to 77, DOH says. Retrieved digitally from https://www.gmanetwork.com/news/topstories/nation/905693/heat-related-illness-cases-rise-to-77-doh-says/story/

20 Cabalza, D. (2024, May 6). *DOH warns heat-related illness can kill; 7 dead since January*. Inquirer.net. https://newsinfo.inquirer.net/1937327/doh-warns-heat-can-kill-7-dead-since-january

21 Greenstone M., Carleton, T., Maricle G., and E Grover-Kopec. 2026. Forecasted additional heat related deaths Sep 2026-Feb 2027 compared to 1996-2025. Climate Impact Lab, The University of Chicago.

II. THE PHILIPPINES: FACING INTERCONNECTED CLIMATE RISKS

The world has been seeing a streak of record-breaking global temperatures since June 2023, prompting United Nations Secretary-General António Guterres to declare that we have come to an era of "global boiling". The year 2024 marked the very first year where the global temperature average breached the 1.5 degree threshold, becoming the warmest year in the 175-year observational record.[22]

Global sea surface temperatures have been setting new records in recent years. Copernicus recorded a mean sea-surface temperature of 20.77°C in July 2025, following the 20.88°C in July 2024.[23] More recently, Copernicus recorded a mean sea-surface of 20.86°C on June 21, 2026[24] setting a new daily record in its dataset.[25] These persistent elevated ocean temperatures expose marine ecosystems in unprecedented temperature conditions that endanger their existence.

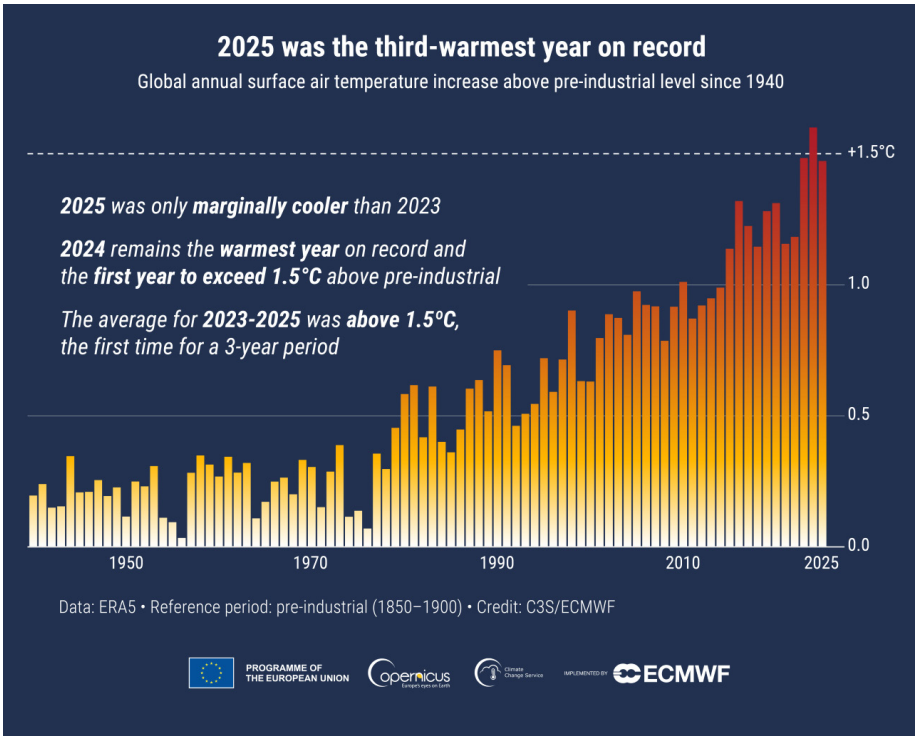


Figure 2. Global surface air temperature (°C) increase above the average for the 1850–1900 designated pre-industrial reference period based on the ERA5 dataset, shown as annual averages since 1940. Source: C3S/ECMWF

22 United Nations. (2025). 1.5°C: what it means and why it matters. https://www.un.org/en/climatechange/science/climate-issues/degrees-matter

23 Copernicus: Third-warmest July marks slight respite from record global temperatures. (n.d.). Copernicus. https://climate.copernicus.eu/copernicus-third-warmest-july-marks-slight-respite-record-global-temperatures

24 June 2026: Global ocean temperatures reach new record | CMEMS. (2026, August 20). https://marine.copernicus.eu/bulletin/june-2026-global-ocean-temperatures-reach-new-record

25 Copernicus Marine and Copernicus Climate Change: Daily global sea surface temperatures break records for the time of year. (2026.). Copernicus. https://climate.copernicus.eu/copernicus-marine-and-copernicus-climate-change-daily-global-sea-surface-temperatures-break-records

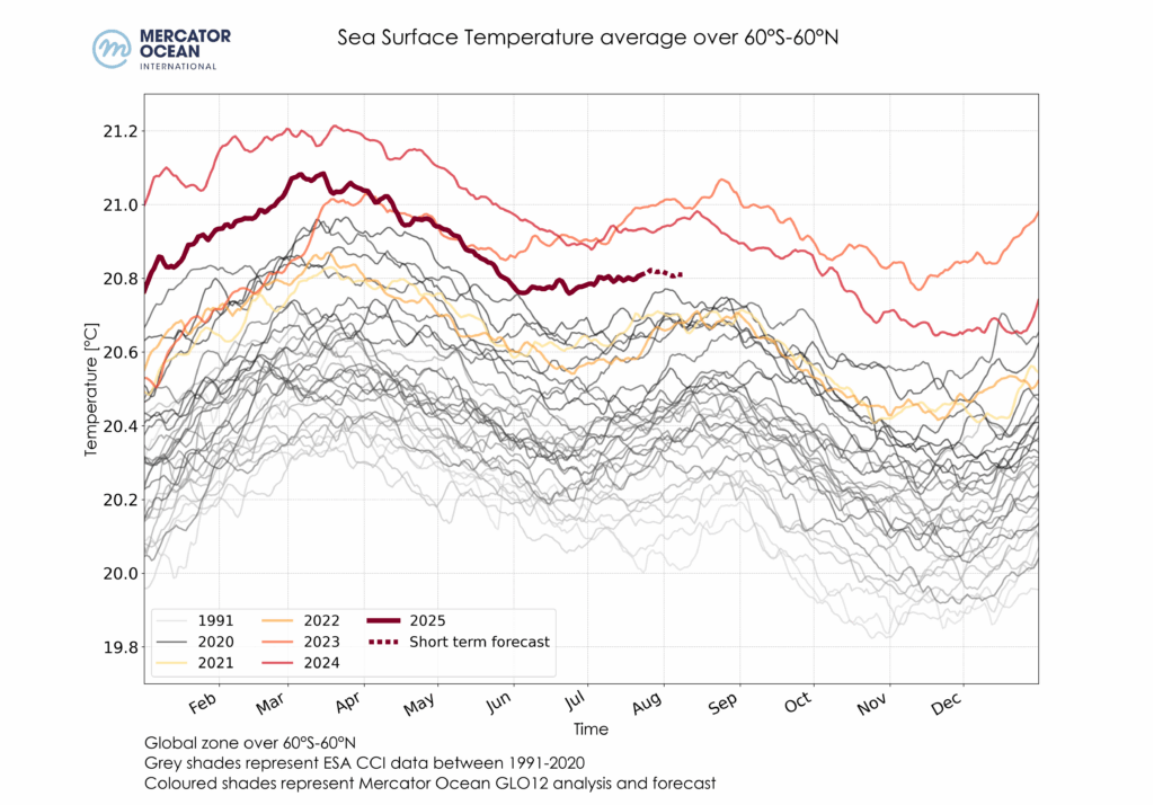


Figure 3. Top: Daily sea surface temperatures averaged for the global ocean between 1991-2020 using ESA's Climate Change Initiative (gray shades), and between 2021-2025 (colored shades)
Source: Mercator Ocean International, July 2025

Global temperatures are approaching the 1.5°C threshold at an accelerating pace. UNEP's 2026 Limiting Overshoot: Navigating exceedance of 1.5°C and pathways towards return[26] report warns that the multi-decadal average global temperature is expected to exceed 1.5°C likely within the next decade. This does not constitute a permanent breach of the Paris Agreement's long-term temperature goal, nor does it mean that a climate tipping point has already been crossed. Instead, it underscores the urgency of rapidly reducing greenhouse gas emissions and limiting the magnitude and duration of any temperature overshoot.

As the sweltering heat maintains its grip on Southeast Asia[27], one of the regions most susceptible to the impacts of the climate crisis, scientists warned that relief from the scorching temperatures is unlikely in the foreseeable future.[28] Climate-vulnerable Philippines is expected to face increasingly adverse conditions from changes in ocean temperatures and atmospheric conditions due to its geographical location in the Typhoon Belt along the western Pacific. Extreme heat disrupts normal weather patterns, leading to various climate hazards such as droughts, increased temperatures, and reduced rainfall.[29]

In 2025, the Philippines remained as the most at-risk country in the world according to the World Risk Index (WRI).[30] The country received a score of 46.45 on a scale from 0 (low risk) to 100 (high risk), taking into account 27 indicators that assess the connection between exposure to hazards and the country's adaptive capacity to such disasters.

26 Limiting Overshoot: Navigating exceedance of 1.5°C and pathways towards return. (2026). https://doi.org/10.59117/20.500.11822/49857

27 Cohen, L. (2024, May 15). Asia just had a deadly heat wave, and scientists say it could happen again. Here's what's making it much more likely. https://www.cbsnews.com/news/asia-deadly-heat-wave-india-bangladesh-climate-change/

28 Chen, H. (2024, April 11). Searing heat is back across Southeast Asia and it's not going away anytime soon | CNN. https://www.cnn.com/2024/04/10/asia/southeast-asia-extreme-heat-climate-intl-hnk

29 NOAA. Climate change impacts. https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts

30 World Risk Report 2025. Bündnis Entwicklung Hilft / IFHV (2025).

At the same time, the Philippines ranked 7th among countries most affected by extreme weather from 1995-2024, according to the Global Climate Risk Index 2026 by Germanwatch.[31] This figure is the accumulation of impacts brought by devastating typhoons such as Typhoon Ondoy (2009), Typhoon Pablo (2012), Super Typhoon Yolanda (2013), and Typhoon Ompong (2018), which were responsible for the loss of thousands of lives and massive damage to agriculture and infrastructure. Over a 20-year period, the Philippines has faced numerous disasters, with over 317 extreme weather events recorded in the country, while recovering from these climate impacts.

31 Adil, L et al. (2025, November). Global Climate Risk Index 2026. Germanwatch e.V.

III. GROWING CONCERNS OVER EL NIÑO AMIDST THE CLIMATE CRISIS

El Niño is a key component and phase of the El Niño-Southern Oscillation (ENSO), a climatic phenomenon that affects global weather patterns.[32] During an El Niño event, trade winds weaken, creating a pool of warm water in the Eastern and Central Pacific. and the tropical Pacific Ocean.[33] This warming of tropical Pacific surface waters extends from near the International Date Line to the west coast of South America, creating disruptions in the typical temperature differences across the equatorial Pacific and altering ocean circulation patterns, significantly impacting precipitation, wind, and temperature patterns across the globe.[34] Historical observations have shown that El Niño occurs approximately every two to seven years.[35] This trend is consistent with a shift in El Niño origination from the eastern to the western Pacific, leading to more frequent extreme events.[36]

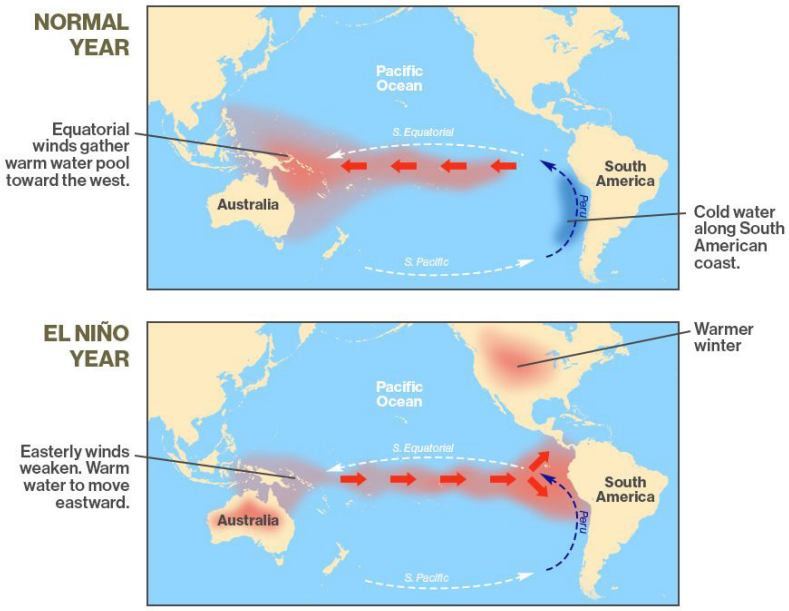


Figure 4. Model of Water Currents of a Normal Year vs. El Niño Year
Source: Food Secured (n.d.)

The intensity of an El Niño is measured through the Oceanic Niño Index[37]. The index makes use of ocean temperature anomalies to grade the severity of the climatic event as (1) weak - with oceanic temperature anomalies of between 0-1℃; (2) moderate - with oceanic temperature anomalies of between 1-1.5℃; (3) strong - with oceanic temperature anomalies of between 1.5-2 ℃; and (4) very strong - with oceanic temperature anomalies of above 2 ℃. There is a growing concern, however, that the climate crisis could lead to the more frequent occurrence of stronger El Niño events, exacerbating its socioeconomic impacts.[38,39] A study by Wang (2017)[40] suggest that a very strong El

32 Krishnamurti, T.N., Stefanova, L., & Misra, V. (2013). El Niño and Southern Oscillation.

33 World Meteorological Organization. El Niño / La Niña Phenomena. https://wmo.int/themes/el-nino-la-nina-phenomena

34 Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds) (2007). Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007. (n.d.) https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html

35 What are El Niño and La Niña?. (n.d) National Oceanic and Atmospheric Administration. https://oceanservice.noaa.gov/facts/ninonina.html

36 Carréric, A., Dewitte, B., Cai, W., Capotondi, A., Takahashi, K., Yeh, S., Wang, G., & Guemas, V. (2019). Change in strong Eastern Pacific El Niño event dynamics in the warming climate. Climate Dynamics, 54, 901-918.

37 Null, J. El Niño and La Niña Years and Intensities. https://ggweather.com/enso/oni.htm

38 Carreric, A. et al., p. 54

39 Carreric, A. et al., p. 901-91

40 Wang, G. (2017) Continued increase of extreme El Niño frequency long after 1.5°C warming stabilization. Nature Climate Change, doi:10.1038/nclimate3351

Niño event in pre-industrial times would likely happen approximately once every 22 years but as the Earth's temperature increases, the occurrence of intense El Niño events are hypothesized to occur more frequently.[41] Three of the most powerful El Niño events were recorded in 1982-1983, 1997-1998, 2015-2016. Currency, another "Very Strong" El Niño event is being monitored in the tropical Pacific and is predicted to be the strongest El Niño phenomenon on record.[42]

Table 1. El Niño Years and Intensities Based on the Oceanic Niño Index
Source: Jan Null, CCM, 2014

El Niño and La Niña Years and Intensities
Based on Oceanic Niño Index (ONI) (Jan Null, 2014, CCM)
Updated thru December 2023 - January 2024 - February 2024

El Niño - 27				La Niña - 25		
Weak - 11	**Moderate - 7**	**Strong - 6**	**Very Strong - 3**	**Weak - 12**	**Moderate - 6**	**Strong - 7**
1952-53	1951-52	1957-58	1982-83	1954-55	1955-56	1973-74
1953-54	1963-64	1965-66	1997-98	1964-65	1970-71	1975-76
1958-59	1968-69	1972-73	2015-16	1971-72	1995-96	1988-89
1969-70	1986-87	1987-88		1974-75	2011-12	1998-99
1976-77	1994-95	1991-92		1983-84	2020-21	1999-00
1977-78	2002-03	2023-24		1984-85	2021-22	2007-08
1979-80	2009-10			2000-01		2010-11
2004-05				2005-06		
2006-07				2008-09		
2014-15				2016-17		
2018-19				2017-18		
				2022-23		

The climate crisis has a significant impact on El Niño cycles, potentially resulting in more intense and prolonged extreme weather events throughout the 21st century.[43] The IPCC Special Report on Global Warming of 1.5°C highlights the urgent nature of the situation. At 1.5°C warming, approximately 14% of Earth's population will face severe heat waves at least once every five years.[44] A strong El Niño event is expected to subject the oceans to more than +1.5°C to +2.0°C of warming which further pushes global oceanic temperature levels past its tipping point, escalating risks associated with the climate crisis by several orders of magnitude.

In October 2026, as the Philippines began to start feeling the early effects of El Niño, 106 municipalities had already been placed under a "State Calamity". Such a declaration is issued when at least 30% of the population's livelihood are affected by the disaster and at least 15% of the population are in need of emergency assistance. The legal declaration activates the emergency powers of the LGU to release calamity funds to curb the potential impacts of El Niño and implement measures to control excessive price increases of basic necessities and services[45].

41 Pearce, R. (2019, February 12). 'Extreme' El Niños to double in frequency under 1.5°C of warming, study says. Carbon Brief. https://www.carbonbrief.org/extreme-el-ninos-double-frequency-under-one-point-five-celsius-warming-study/

42 Dinneen, J. (2026, July 23) This El Niño is set to be the largest on record by a 'mind-blowing margin', Nature. https://www.nature.com/articles/d41586-026-02293-y

43 Technical Summary — Special Report on the Ocean and Cryosphere in a Changing Climate. (n.d.). Special Report on the Ocean and Cryosphere in a Changing Climate. https://www.ipcc.ch/srocc/chapter/technical-summary/

44 Summary for Policymakers of IPCC Special Report on Global Warming of 1.5governments—IPCC.°C approved by governments — IPCC. (2018, October 8). IPCC. https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/

45 Republic Act No. 10121. Philippine Disaster Risk Reduction and Management Act.

IV. MARINE BIODIVERSITY IN PERIL DUE TO EL NIÑO

The Philippines is known for its rich marine biodiversity. Part of the Coral Triangle, it holds one of the most ecologically valuable marine areas in the world that supports fisheries, among other sectors.

One of the country's most famous ecological gems is the Verde Island Passage known as the "Amazon of the Ocean", which is famously acknowledged as the 'center of the center' of marine shorefish biodiversity in the world. In a radius of ten kilometers, the marine corridor is home to more than 300 distinct types of coral and an estimated 1,736 different species of fish.[46] Unfortunately, the VIP faces major threats due to the rise of fossil gas plants, liquefied natural gas (LNG) terminals, and other industrial activities in the area, which are disruptive to marine and coastal ecosystems.[47] This amplifies the already intensifying vulnerabilities of coastal communities and biodiversity to the climate crisis, including during an El Niño phenomenon.



Figure 5. Marine fauna and flora documented in Verde Island Passage
Photo by: Alvin Simon, 2023

46 Carpenter, K.E., Springer, V.G. The center of the center of marine shore fish biodiversity: the Philippine Islands. Environ Biol Fish 72, 467–480 (2005). https://doi.org/10.1007/s10641-004-3154-4

47 CEED. (2021). Philippine Fossil Gas Landscape. Retrieved digitally from https://ceedphilippines.com/wp-content/uploads/2021/07/Philippine-Fossil-Gas-Landscape.pdf



Figure 6. A Clownfish Documented in the Verde Island Passage
Photo by: Alvin Simon, 2023

Ocean warming: Threats to coral reefs and marine biodiversity

With the rise in sea surface temperature during El Niño, the corals experience thermal stress, which causes coral bleaching. In such sub-optimal conditions, corals expel symbiotic algae which is essential for their survival and their brilliant coloring. Prolonged exposure to elevated sea temperatures could be lethal to these "rainforests of the sea," leading to large-scale reef mortality[48]

The most recent assessment on country-wide coral reef cover in 2017 reported average coral cover of the country to be at 22% where over 90% of the 166 assessed reefs were categorized as with "poor" coral cover. This value is comparable to those in the Indo-Pacific region but is significantly lower compared to historical estimates in the country. The mass coral bleaching events that occurred during the years of 1998, 2010, and 2015-2017 were identified as one of the strongest drivers causing this decline. [49,50,51,52] During the 2009-2010 El Niño, up to 95 percent of the corals in the Philippines died after a massive coral bleaching event.[53] The decline in coral cover can lead to the loss of overall reef biodiversity, affecting the ability of reefs to provide critical ecosystem services.[54]

48 Coral reef ecosystems. (n.d.). National Oceanic and Atmospheric Administration. https://www.noaa.gov/education/resource-collections/marine-life/coral-reef-ecosystems

49 Licuanan, W.Y., & Gomez, E.D. (2000). Philippine coral reefs: Status and the role of the academe to improve their management.

50 Licuanan, A., Reyes, M., Luzon, K.S., Chan, M.A., & Licuanan, W.Y. (2017). Initial Findings of the Nationwide Assessment of Philippine Coral Reefs.

51 Alcala, A.C., & Russ, G.R. (2002). Status of Philippine Coral Reef Fisheries. Asian fisheries science, 15, 177-192.

52 Coastal Resource Management Project (CRMP). 1998. Our Seas Our Life: A Guide to Understanding Ocean Life and its Importance to Us. Published by CRMP, Cebu, Philippines.

53 Colossal coral bleaching kills up to 95 percent of corals in the Philippines. (2010, September 23). Mongabay Environmental News. https://news.mongabay.com/2010/09/colossal-coral-bleaching-kills-up-to-95-percent-of-corals-in-the-philippines/

54 Hoegh-Guldberg O, Mumby PJ, Hooten AJ, Steneck RS, Greenfield P, Gomez E, Harvell CD, Sale PF, Edwards AJ, Caldeira K, Knowlton N, Eakin CM, Iglesias-Prieto R, Muthiga N, Bradbury RH, Dubi A, Hatziolos ME. Coral reefs under rapid climate change and ocean acidification. Science. 2007 Dec 14;318(5857):1737-42. doi: 10.1126/science.1152509. PMID: 18079392.



Figure 7. A bleached acropora coral.
Photo by: Reuters for Australian Institute Of Marine Science/Veronique Mocellin

The effects of the Fourth Coral Bleaching event was last felt in the Philippines in the final quarter of 2025. Although there is no comprehensive, country-wide assessment to monitor coral bleaching across the country, available data indicate that the reefs around the West Philippine Sea, such as Pangasinan, were some of the most severely hit with a reported 51-59% percent decline in hard coral cover.[55]

In less than a year after the end of the 2024 El Niño, Philippine waters were placed again on bleaching alert status, reaching its peak at Alert Level 2 during the month of July 2026. This exposed the reefs to temperatures of over 1 degree Celsius over the maximum monthly mean which can potentially trigger widespread bleaching and coral mortality. As of October 2026, sea surface anomalies have been recorded to exceed +4.0°C in some portions of the eastern equatorial Pacific - values that are considered fatal for temperature sensitive hard corals. Philippine reefs are currently at a "Bleaching Warning" stage which means that it is currently exposed to accumulating thermal stress and that there is an increased likelihood of bleaching, should elevated temperatures persist.[56]

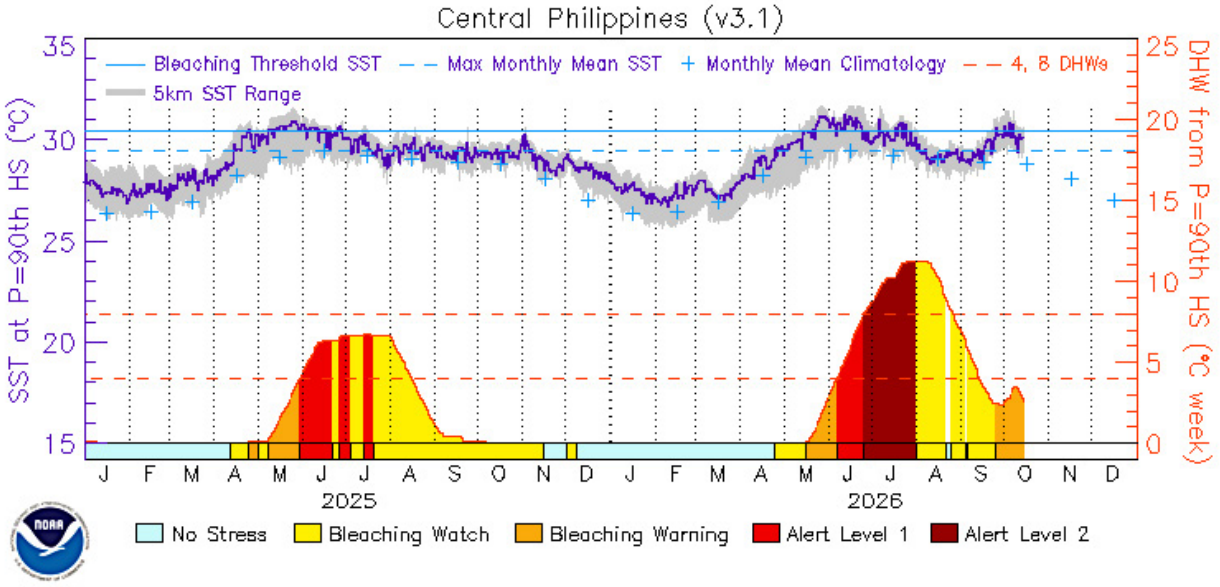


Figure 8. Coral bleaching alert stages in the Philippines from 2025-2026.
Source: NOAA Coral Reef Watch.

55 DOST-PCAARD. (November 2025). Boosting coral reef resilience through marine heatwave tracking and coral reef monitoring. https://www.pcaarrd.dost.gov.ph/index.php/quick-information-dispatch-qid-articles/boosting-coral-reef-resilience-through-marine-heatwave-tracking-and-coral-reef-monitoring

56 NOAA Coral Reef Watch. October 2026. Central Philippines - 5 km Regional Bleaching Heat Stress Maps and Gauges

Disruption of fisheries: Shifts in fish distribution and declines in catch

The El Niño phenomenon affects factors crucial for ocean-atmosphere interactions such as salinity, nutrient availability, upwelling, and precipitation rate. These changes in the sea affect marine organisms, leading to increased phytoplankton biomass, with the possible implications of fish kills, diseases in seaweed, and threats to marine mammals.[57] Disruptions to fisheries are mostly caused by changes in the oceanic conditions, including sea surface temperatures and changes in the ocean currents.

The influence of the El Niño phenomenon on the marine environment and fisheries of the Philippines is substantial, resulting in great changes in fish distribution and reductions in catches.[58] During El Niño, fish species change their distribution by either migrating to cooler waters or changing their feeding and spawning habits in response to changing environmental conditions.[59,60] These effects are obvious within pelagic species, especially where warmed temperatures and oxygen limitations directly disturb catch compositions.

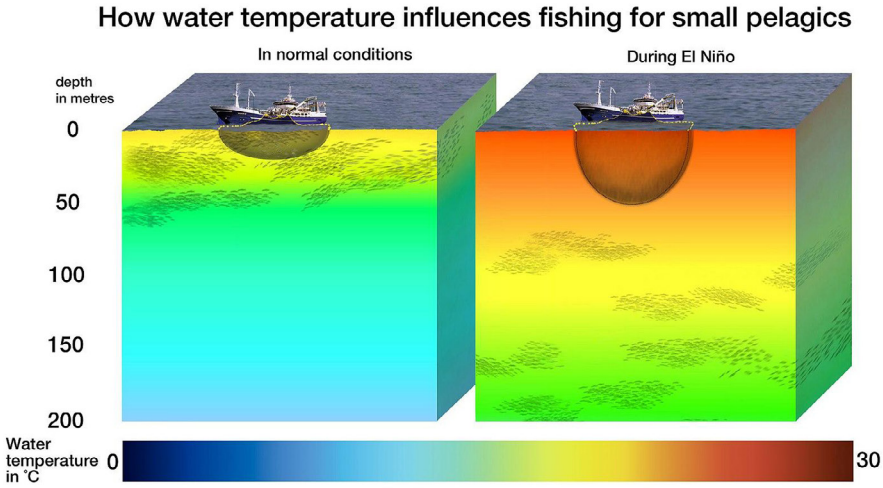


Figure 8. As water temperatures rise and nutrient levels decline, shoals of cold-water-loving small pelagics scatter and descend to depths of 150 to 200 meters, where they are inaccessible to traditional surface seiners, or they migrate south. Source: NOAA

The 2024 El Niño event was reported to cause P52.44 million worth of losses, affecting a total of 2,679 fishers across the country. Overall, the event has resulted in 15.3 billion pesos worth of losses in the whole agricultural sector.[61] One of the most severely hit sub-sector in the fisheries industry is the seaweed farming industry, which is also one of the country's top aquaculture export products. The Elkhorn seamoss, Kappaphycus alvarezii, is a temperature sensitive brown algae which accounted for 90% of the country's seaweed production in 2024.[62] The rise in seawater temperature triggered the outbreak of Ice-Ice Disease which in turn, led to high mortality and a significant drop in production.

57 Damatac, Amor Ii & Santos, Mudjekeewis. (2016). Possible Effects of El Niño on Some Philippine Marine Fisheries Resources. Philippine Journal of Science. 145. 283-295.

58 see Damatac, A. et al., p 283

59 Zhang W. et al., 2011. Contrasting impacts of two-type El Niño over the western North Pacific during boreal autumn, J. Meteorol. Soc. Jpn., 89, 563–569.

60 D'Antoni, E. (2009). Climate change implications for fisheries and aquaculture Overview of current scientific knowledge.

61 Philippine Information Agency. (March 2025). Another step towards ending drought: Cushioning the impact of El Niño. https://pia.gov.ph/press-release/another-step-towards-ending-drought-cushioning-the-impact-of-el-nino/

62 FAO. 2024. El Niño impacts and policies for the fisheries sector. FAO Innovation for Blue Transformation. Rome. https://doi.org/10.4060/cd3812en

Vulnerability of coastal habitats: Implications for ecosystem services and resilience

Coastal habitats, such as mangroves, coral reefs, and seagrass beds, provide essential ecosystem services, including coastal protection, enhancement of fisheries, habitat provision, and carbon sequestration, which contribute to the well-being of both coastal communities and marine ecosystems. Protecting these coastal ecosystems are considered effective nature-based solutions that enhance climate resilience and support the livelihood needs and food security of coastal communities.

El Niño events also threaten the integrity of these coastal marine ecosystems. Mangrove forests, which thrive in specific optimal salinity ranges, suffer immensely from freshwater input during intense rainfall. Heavy freshwater input and associated runoff decrease salinity, subjecting mangrove trees to stress or mortality.[63] Similarly, intense drought which results in increased water salinity can also lead to mortality and reduced mangrove cover. Hypersaline environments can induce osmotic stress and impair photosynthesis resulting in stunting and death for certain mangrove species.[64]

A rise in sea levels, on the other hand, have been predicted to trigger landward migration of mangrove forests while species closest to the sea "drown" due to sea water inundation.[65] In 2017, 30% of mangrove forests died in Mangrove Bay in the Cape Range National Park, Western Australia, due to the intensification of El Niño, resulting from extreme variation in sea levels.[66]

These extreme shifts in environmental parameters weaken the resilience of mangrove forests and seagrass beds, rendering them more susceptible to disease, mortality, and habitat degradation.[67]

63 Gibson, R. N., Barnes, M., & Atkinson, R. J. A. (2002). Impact of changes in flow of freshwater on estuarine and open coastal habitats and the associated organisms. Oceanography and Marine Biology: An Annual Review, 40, 233.

64 Shamim Ahmed, Swapan Kumar Sarker, Daniel A. Friess, Md. Kamruzzaman, Martin Jacobs, Md. Akramul Islam, Md. Azharul Alam, Mohammad Jamil Suvo, Md. Nasir Hossain Sani, Tanmoy Dey, Clement Sullibie Saagulo Naabeh, Hans Pretzsch. (2022). Salinity reduces site quality and mangrove forest functions. From monitoring to understanding, Science of The Total Environment. 853 . https://doi.org/10.1016/j.scitotenv.2022.158662

65 Mafi-Gholami, D., Zenner, E. K., & Jaafari, A. (2020). Mangrove regional feedback to sea level rise and drought intensity at the end of the 21st century. Ecological Indicators, 110, 105972.

66 Lovelock, C.E., Feller, I.C., Reef, R., Hickey, S.M., & Ball, M.C. (2017). Mangrove dieback during fluctuating sea levels. Scientific Reports, 7.
Luo, Y., Lu, J., Liu, F., & Liu, W. (2015). Understanding the El Niño-like oceanic response in the tropical Pacific to global warming. Climate Dynamics, 45, 1945-1964.

67 Röthig, T., Trevathan-Tackett, S. M., Voolstra, C. R., Ross, C., Chaffron, S., Durack, P. J., Warmuth, L. M., & Sweet, M. (2023). Human-induced salinity changes impact marine organisms and ecosystems. Global Change Biology, 29, 4731-4749. https://doi.org/10.1111/gcb.16859

V. COASTAL COMMUNITIES AT THE FOREFRONT OF EL NIÑO IMPACTS

The Philippines is home to the fifth-longest coastline in the world, with a length of approximately 36,000 kilometers. [68] More than 70% of the 1,500 municipalities are coastal, with many millions of Filipinos living along the coast whose livelihoods, ways of life, and welfare are deeply linked with marine resources. This makes them one of the most vulnerable sectors to the impacts of El Niño.

Socioeconomic disparities and vulnerability

El Niño aggravates socioeconomic disparities and vulnerabilities among fisherfolk by causing a decline in fish catch, which directly impacts the income and livelihoods of coastal communities. As El Niño worsens, the reduced catch yields lead to food insecurity, especially for those who rely on marine resources as staples.

A recent study by the Bangko Sentral ng Pilipinas (BSP) examined the relationship of the rise of atmospheric temperatures to macroeconomic indicators and revealed that a warming climate can indeed contribute to reduced GDP growth and cause higher inflation.[69] The study highlighted how the effects of the climate crisis extends beyond the agricultural sector, affecting critical sectors such as the manufacturing and service industries. Disruptions to the delivery of basic goods and services can potentially lead to increasing prices, conflicts over dwindling resources, and over-all food insecurity.

68 Partnerships in Environmental Management for the Seas of East Asia. https://pemsea.org/who-we-are/our-partners/country-partners/philippines

69 Punongbayan, J. (2024, May 3). [In This Economy] El Niño-nomics: How intense heat is drying up the Philippine economy. RAPPLER. https://www.rappler.com/voices/thought-leaders/in-this-economy-el-nino-economics-intense-heat-drying-up-philippines/

Box 1. "Fisherfolk in Rizal, Occidental Mindoro adapt to El Niño challenges by shifting to night fishing and assisting rice farmers during the day for additional income."

In an interview, Melchor Graciadas, a fisherfolk from Rizal, Occidental Mindoro, narrated how the fishermen suffered from the effects of El Niño. Daytime fishing had become almost impossible in Occidental Mindoro, which became one of the worst-hit areas by the 2023-2024 El Niño due to intense heat and a scarce supply of fish within their traditional fishing grounds. These also add to the impact of the destructive oil spill in the Verde Island Passage last year, further worsening the difficulties already faced by fisherfolk and coastal communities.

As a result of these compounding challenges, they would go fishing during the night and catch squids known locally as "pamumusit," when temperatures are cooler and there is a slightly better chance of finding catch (Graciadas, M., personal communication, May 28, 2024).



Figure 9. Small-scale fisherfolk heading to the sea to fish. Taken May 31, 2024 in Batangas, Philippines. Photo by: Mikki Luistro

However, night fishing does not always ensure a successful catch of fish. In such instances, the fisherfolk mentioned that they sometimes have to find alternative ways of livelihood. One example of this is helping rice farmers spread harvested rice in the sun to dry it up. This becomes a temporary means of livelihood for them to be able to survive hard times, although the work is very physically demanding and totally different from their fishing activities.

Agricultural impacts: Reduced fish catch, poverty, and food insecurity

The fisheries sector is among the main drivers of the Philippine economy, providing food security and employment. [70] The standardized national registration system for municipal fisherfolk, known as FISH, lists 2.30 million registered fisherfolk in 2022 engaged in various types of fishery-related livelihoods across different municipalities in the country. Capture fishing constituted 54.7% of the distribution of livelihoods, rendering it the predominant source of income among fisherfolk. Aquaculture accounted for 11.4% of the total, gleaning for 11.1%, fish vending for 7.3%, fish processing for 2.0%, and remaining activities accounted for 17.6%.[71]

70 Yap, W.G. (1999). Rural Aquaculture in the Philippines.

71 Bureau of Fisheries and Aquatic Resources. (2024). 2024 Philippine Fisheries Profile. Retrieved digitally from https://www.bfar.da.gov.ph/wp-content/uploads/2026/02/FINAL_FOR-PUBLICATION-2024-FISHERIES-PROFILE-SIZE-A4.pdf

The country is among the big producers of both wild caught and cultured marine products. Furthermore, it is reported to have a high per capita fish consumption.[72] The fisheries sector, comprising coastal municipal fishing activities, contributes approximately 4% of the GNP of the Philippines.[73] It is estimated that the coastal fishing subsector accounts for between 40 and to 60% of the total catch of the country.[74] The other important component of the fisheries sector is aquaculture, which produces a diversified array of species.[75] As such, the fisheries sector is a significant source of employment, directly employing more than 1.5 million Filipinos, with over half involved in small-scale fishing operations.[76]

The country ranked 11th in terms of production of fish, crustaceans, mollusks, and aquatic plants, including seaweeds, in 2022.[77] According to the data of 2022, the combined value of fishing and aquaculture activities was PHP 269.64 billion, accounting for 12.82 percent of the national economy. In terms of the different sectors of agriculture, it ranked second, after crops with a share of 46.41 percent and livestock with 14.25 percent. On the other side, the fisheries industry sustained a trade surplus of USD 292.25 million, equivalent to PHP 15.92 billion.[78]

The importance of coastal fishing is not limited to economic indicators, as fish and other marine products play a critical role for food security and nutrition in their entirety in the Philippines. Marine resources provide about 70% of the total intake of animal protein and 30% of the total protein intake of Filipinos[79]. Coastal communities are largely dependent on fisheries for food and income generation; thus, fish has become staple food to many households.[80]

Unfortunately, people often disregard issues confronting the fisheries sector, including those resulting from El Niño. During the El Niño of 1990-1992, the damage caused by El Niño-induced drought in the Philippines was estimated to be PHP 4.1 billion (P 24=USD$1). While the damage to agriculture has been thoroughly examined, especially in rice and corn production, the impact on fisheries has been largely overlooked and underreported[81].

72 Guevara, G., & Camu, C.C. (1988). The fish processing industry in the Philippines: Status, problems and prospects.

73 see Footnote 63

74 FAO. 2020. The State of World Fisheries and Aquaculture 2020. Sustainability in action. Rome. https://doi.org/10.4060/ca9229en

75 Aypa SM. 1995. Aquaculture in the Philippines, pp. 137-147. In: Bagarinao TU, Flores EEC (eds) Towards Sustainable Aquaculture in Southeast Asia and Japan. SEAFDEC Aquaculture Department, Iloilo, Philippines.

76 Fisheries Production Volume Up by 2.2%, BFAR |. (2023, February 21). https://www.bfar.da.gov.ph/2023/02/21/2022-fisheries-production-volume-up-by-2-2/#:~:text=According%20to%20the%20preliminary%20data,comparison%20to%20the%20previous%20year's

77 2022 Philippine Fisheries Profile. (2022). Bureau of Fisheries and Aquatic Resources. https://www.bfar.da.gov.ph/wp-content/uploads/2024/02/2022-Philippine-Fisheries-Profile.pdf p. ii

78 2022 Philippine Fisheries Profile. (2022). Bureau of Fisheries and Aquatic Resources p. xi

79 Balgos, M.C. (2005). Integrated coastal management and marine protected areas in the Philippines: Concurrent developments. Ocean & Coastal Management, 48, 972-995.

80 Teh, L.S.L., Teh, L.C.L., Giron-Nava, A. et al. Poverty line income and fisheries subsidies in developing country fishing communities. npj Ocean Sustain 3, 14 (2024). https://doi.org/10.1038/s44183-024-00049-7

81 Guerrero, R.D. III. (1999). The Impacts of El Niño on Philippine Fisheries. Special Report. World Fish Center. https://digitalarchive.worldfishcenter.org/server/api/core/bitstreams/ea1152b1-bc76-4fb4-a661-d8fb754d0038/content

Box 2. "Perceived Impacts of the 2026-2027 El Niño by Municipal Fisherfolk in the Verde Island Passage"

A focus group interview with various fisherfolk groups in the Verde Island Passage highlights their lived experiences and concerns related to the El Niño phenomenon and other climate variabilities. During the FGD conducted in September 2026, thirty fisherfolk from **Bukluran ng Mangingisda sa Batangas (BMB)** revealed a steadily dwindling catch of the most commonly caught fish species, namely '**Tulingan'** and **'Matambaka**'. The fisherfolk participants attribute this decline to the early effects of El Niño, compounded by competition with commercial fishing vessels that sometimes intrude into their fishing grounds. As a result, they are now fishing farther from the usual fishing grounds, costing them more time, effort and resources.

Signs of coastal erosion have also been reported by the fisherfolk, citing that they are slowly losing beach area to dock their boats making it very vulnerable to strong waves and rising tides, especially during typhoon season.



Figure 10. FGD session with various fisherfolk groups from Batangas and Oriental Mindoro Photos by: Jocelyn Bellin

Apart from declining fish catch, dwindling freshwater supply was one of the gravest concerns among municipal fisherfolk interviewed in Oriental Mindoro. In the town Puerto Galera, coastal communities need to share water allocation with a thriving tourism sector. According to the FGDs, resorts rely on deep wells for daily operations and potable water for drinking, while the local water district remains the main household water source. However, fluctuating supply has already been a concern even before the 2026 El Niño event was formed in the Tropical Pacific, with reports of inadequate responses from the government in solving water insecurity, including the rising cost of potable water in coastal areas. Many families fear that these prices will increase as water insecurity worsens. Women responsible for selling fish catch also reported rising cost of ice, adding to their expenses for preserving and transporting fish.

Moreover, the rise of industrial activities, especially fossil-based activities, in marine and coastal environments further adds to the decline of local fish stock due to actions such as the discharge of gas plants and the concentration of toxic chemicals in some rich fishing grounds in the country. [82,83]

In the first quarter of 2026, the Philippine Statistics Authority reported a 22.82% decline in the volume of total fisheries production, largely contributed by a 34.57% reduction in municipal fish catch (Fig.11)[84].

82 Andrews, N., Bennett, N., Billon, P. L., Green, S., Cisneros⊠Montemayor, A. M., Amongin, S., Gray, N. J., & Sumaila, U. R. (2021, May 1). Oil, fisheries, and coastal communities: A review of impacts on the environment, livelihoods, space, and governance. Energy Research & Social Science. https://doi.org/10.1016/j.erss.2021.102009

83 Andres, B. (2023, December). LNG, Shipping, and the Amazon of the Oceans. Center for Energy, Ecology and Development. https://ceedphilippines.com/wp-content/uploads/2023/12/CEED_Shipping-Impacts-Paper.pdf

84 Philippine Statistics Authority. June 2026. Fisheries Volume of Production, Batangas: First Quarter 2026.

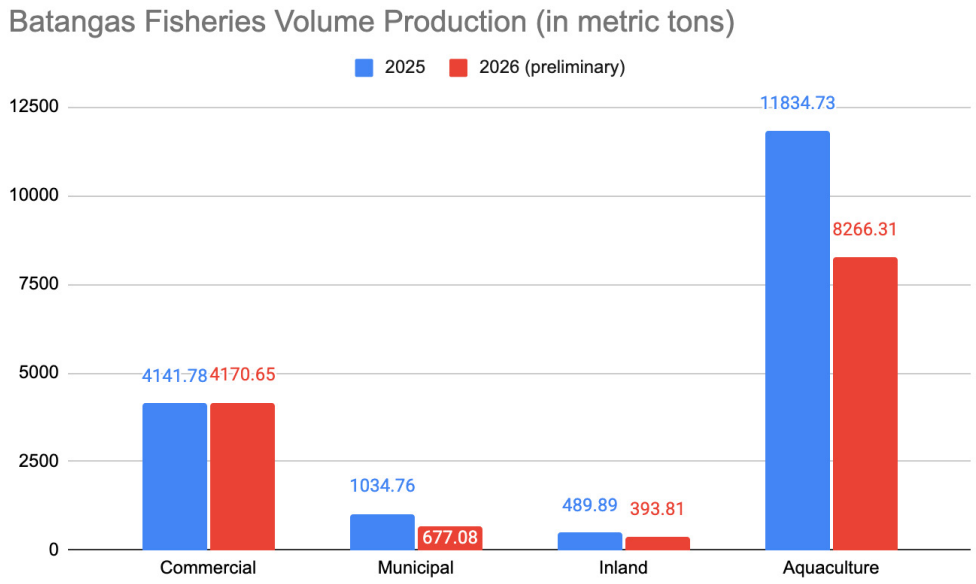


Figure 11. Batangas Fisheries Volume Production for 2025 vs 2026 (using preliminary data). Source: Philippine Statistics Authority, June 2026

VI. EL NIÑO RIPPLE EFFECT IN THE PHILIPPINES

The impacts of El Niño in the Philippines are multidimensional, encompassing not only environmental aspects but also social inequalities, conflict dynamics, and governance issues.

Rising sea levels: Displacement and increased risk of coastal flooding and erosion

Much of the Philippine's coastlines are low-lying areas that are very susceptible to coastal flooding and erosion. El Niño events raise the rate of coastal erosion because waves during such periods are rough, coupled with higher storm surges.[85] During an El Niño event, this warming of the sea surface throws off normal atmospheric circulation, resulting in more frequent and intense storms. These storms create very strong waves that will pound and erode shorelines, ultimately accelerating coastal erosion.[86] Because of thermal expansion, sea levels are usually higher during El Niño. This, coupled with higher storm surges, enhances the potential for coastal flooding especially in low lying areas.

The loss of vital ecosystem services such as natural coastal protection, defenses, and infrastructure from mangroves, coral reefs, and seagrass beds exacerbates the vulnerability of coastal communities to flooding, storm surges, and land loss. This degradation further diminishes coastal ecosystems' capacity to support fisheries, regulate water quality, and sequester carbon.

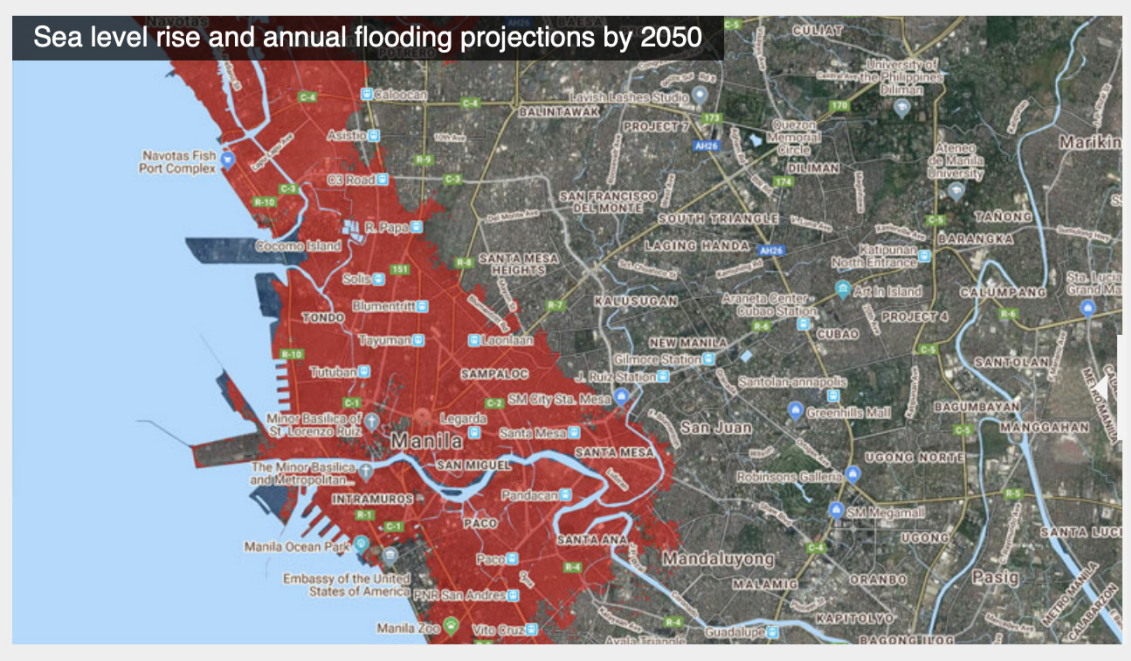


Figure 12. Metro Manila, the country's political and economic center is identified as one of the vulnerable areas to sea level rise. Source: Climate Central Interactive Map, 2019

According to the study conducted by Climate Central[87], a science organization based in New Jersey, the ongoing rise in sea levels will put regions in the Philippines at risk of submerging in the next three decades. Based on the projections, by the end of the century, a significant number of Filipinos may face the risk of living in areas that are below the average annual coastal flood level.[88] They use interactive maps to display areas threatened by rising sea levels and coastal flooding, combining advanced global coastal elevation models with future flood projections.

85 Ruggiero, P. (2013) Is the intensifying wave climate of the US Pacific Northwest increasing flooding and erosion risk faster than sea level rise? J. Waterw. Port. Coast. Ocean Eng. 139, 88–97.

86 Hansom, Jim & Switser, & Pile, Jeremy & Switzer, Adam. (2015). Extreme Waves: Causes, Characteristics and Impact on Coastal Environments and Society.

87 Sea level rise map and coastal flood tool — US and global. (n.d.). https://coastal.climatecentral.org/map/12/120.9615/14.615/?theme=water_level&map_type=water_level_above_mhhw&basemap=roadmap&contiguous=true&elevation_model=best_available&refresh=true&water_level=1.0&water_unit=m

88 Cabico, G. K. (2019, November 22). In 30 years, rising seas will threaten Philippine cities, towns home to 6.8 million. Philstar.com. https://www.philstar.com/headlines/2019/11/06/1966508/30-years-rising-seas-will-threaten-philippine-cities-towns-home-68m

Kulp and Strauss's projections raise serious concerns about the vulnerability of major coastal cities like Manila, Cebu, and Zamboanga.[89] These cities' critical infrastructure, such as roads, ports, airports, and utilities, are located along the coast and are at great risk. Disruption in these areas will affect transportation networks, economic activities, and access to essential services for coastal communities.[90]

Resource Competition and Conflict in Municipal Waters

While the relationship between the climate crisis, conflict, and food security is complex, it is evident that competition over resources raises tensions and leads to varied social conflicts, especially during climate-induced events such as El Niño. According to a collaborative research spearheaded by the Department of Land Resource Management and Agricultural Technology in the University of Nairobi, localized conflicts affect areas in which communities fight for dwindling food, water supplies, and arable land.[91] These conflicts deepen social divisions, disrupt livelihoods, and weaken community cohesion, thus posing challenges to peace and security.

Similar disputes have also been observed in the Philippines. In 2016, tensions erupted into violent clashes between farmers and law enforcers during the El Niño season as farmers protested for better government aid in Kidapawan, North Cotabato. The altercation resulted in three deaths and about a hundred people injured.[92]

Another common problem that has contributed to the dwindling fish catch among municipal fishes is the intrusion of large commercial fishing boats into municipal waters, which are usually the area of operation for small-scale fishers[93]. Municipal waters are defined as coastal waters within 15 kilometers of the coastline that are normally fished for livelihood using traditional methods by small fishers.

Philippine waters have also faced encroachment from neighboring countries. In August 2023, the Armed Forces of the Philippines reported a disturbing number of Chinese fishing vessels operating within its exclusive economic zone. The surge occurred weeks after the US National Oceanic and Atmospheric Administration declared the start of El Niño.[94] According to Wilson Center's Environmental Change and Security Program, conflicts over fisheries in the East and South China Seas have been a recurring issue, but the recent incident highlights larger patterns that could have significant consequences as the El Niño cycle is intensified by the climate crisis.[95]

89 Kulp, S.A., Strauss, B.H. New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding. Nat Commun 10, 4844 (2019). https://doi.org/10.1038/s41467-019-12808-z; see Footnote 66

90 Perez, R.T., Feir, R.B., Carandang, E., & Gonzalez, E.B. (1996). Potential impacts of sea level rise on the coastal resources of Manila Bay: A preliminary vulnerability assessment. Water Air and Soil Pollution, 92, 137-147.

91 Wasonga, O.V., Schilling, J., & Mureithi, S.M. (2012). Resource-based conflicts in drought-prone Northwestern Kenya: The drivers and mitigation mechanisms. Journal of Agricultural Research, 1, 442-453.

92 Olea, R. V. (2016, April 4). *Neglect of farmers led to Kidapawan massacre*. Bulatlat. https://www.bulatlat.com/2016/04/02/neglect-of-farmers-led-to-kidapawan-massacre/

93 Buan, L., & Gozum, I. (2024, April 9). Big fishers encroach on small fisherfolk's municipal waters. RAPPLER. https://www.rappler.com/newsbreak/investigative/big-fishers-close-in-small-filipino-fisherfolk-battle-municipal-waters/

94 June 2023 ENSO update: El Niño is here. (2023, June 8). NOAA Climate.gov. https://www.climate.gov/news-features/blogs/enso/june-2023-enso-update-el-nino-here#:~:text=El%20Ni%C3%B1o%20conditions%20have%20developed,pretty%20good%2C%20at%2056%25.

95 Hendrix, C. S., Glaser, S. M., Lambert, J. E., & Roberts, P. M. (2022). Global climate, El Niño, and militarized fisheries disputes in the East and South China Seas. Marine Policy, 143, 105137.

Table 3: Occurrence of Fisheries Disputes and El Niño Episodes, East and South China Sea-Adjacent Country Pairs

Country	MFD Onsets during El Niños	MFD Onsets not during El Niños
Vietnam	5 (100.0%)	0 (0.0%)
Japan	6 (85.7%)	1 (14.3%)
Indonesia	5 (83.3%)	1 (16.7%)
Philippines	7 (77.8%)	2 (22.2%)
Malaysia	3 (75.0%)	1 (25.0%)
China	14 (73.7%)	5 (26.3%)
Taiwan	6 (66.7%)	3 (33.3%)
South Korea	2 (66.7%)	1 (33.3%)
TOTAL	*48 (77.4%)*	*14 (22.6%)*
	El Nino Event Years, 1950-2010	~El Nino Event Years, 1950-2010
	31 (50.8%)	30 (49.2%)

Source: Hendrix, C. S., Glaser, S. M., Lambert, J. E., & Roberts, P. M., Global climate, El Niño, and militarized fisheries disputes (MFD) in the East and South China Seas, 2022

According to this new study, the probability of militarized disputes over fisheries increases sharply during climatic events in the East and South China Seas.[96] During El Niño conditions, changes in ocean temperature can shift the distribution of fish populations across the ocean while sub-optimal conditions can reduce their abundance. This resource scarcity can intensify fishing competition and exacerbate militarized fisheries disputes. In October 2023, a still unidentified foreign commercial vessel collided with a fish boat in the West Philippines Sea, resulting in the deaths of three Filipino fishermen.[97]

As local challenges intersect with international concerns and access to fishing grounds dwindles, Filipino fishing communities continue to be affected by the impacts of environmental and geopolitical factors that further aggravate their already precarious situation.

The groups described the 2024 as the worst the country had experience and have underscored that recognizing a national climate emergency should go beyond a formal declaration but rather be accompanied by a stronger climate mitigation and resilience measures, adequate and accessible finance and swift allocation of resources to protect communities and livelihoods from escalating climate-related impacts,as illustrated by El Niño and other climate hazards.The groups also emphasize the need for longer-term measures, including transitioning away from fossil fuels and accelerated development of renewable energy to address the underlying drivers of climate crisis.

The conflict over the delineation of municipal waters and commercial fishing grounds is another problem facing the Filipino fishing community. Disputes over access to fishing areas and resources have arisen due to the competition between local communities and larger-scale commercial fishing operations, with the latter often being favored by the government. While transboundary issues within Philippine territory further complicate the problem, tensions in the sea, along with accompanying resource depletions, are further strained by neighboring countries' encroachment upon our territories and exploitation of common marine resources.

96 Hendrix, C. S., Glaser, S. M., Lambert, J. E., & Roberts, P. M. (2022, September 1). Global climate, El Niño, and militarized fisheries disputes in the East and South China Seas. Marine Policy. https://doi.org/10.1016/j.marpol.2022.105137

97 Jazeera, A. (2023, October 4). Philippines: MaJr.oJr.Jr says boat deaths in South China Sea being probed. Al Jazeera. https://www.aljazeera.com/news/2023/10/4/philippines-marcos-jr-says-boat-deaths-in-south-china-sea-being-probed

Table 4: IUU Fishing Estimates in the Philippines.
Source: Rappler, 2021

RECENT IUU FISHING ESTIMATES IN THE PHILIPPINES

Sector	Illegal	Unregistered	Unreported
Municipal	257,000-402,000 MT/year P24.1-37.8 billion	80,000-125,000 unregistered municipal fishing vessels	309,000-485,000 MT/year P29.0-45.6 billion
Commercial	259,000-364,000 MT/year P17.7-17.8 billion	1,600-2,700 unregistered or incorrectly registered commercial fishing vessels	274,000-422,000 MT/year P18.7-28.7 billion
Total	516,000-766,000 MT/year P41.8-62.6 billion	81,600-127,700 unregistered fishing vessels	583,000-907,000 MT/year P47.7-74.3 billion

Source: Quantifying the Prevalence and Impact of Illegal, Unreported, and Unregulated Fishing in the Philippines, Survey and Workshop Report, 31 January 2021

Illegal, unreported, and unregulated fishing methods (IUU) have likewise jeopardized marine ecosystems and fisheries. A USAID-BFAR study estimates that illegal fishing causes losses of PHP 24.1 billion to 37.8 billion per year in the municipal fisheries sector, equivalent to 257,000 to 402,000 metric tons in fisheries catch.[98] Added to this is the unreported catch and numerous unregistered commercial fishing vessels and fishermen.[99] These activities compromise conservation efforts, distort market dynamics, and eventually deprive small fisherfolk of their livelihoods. Furthermore, the combination of these human-induced stressors and the impacts of El Niño are greatly straining marine ecosystems and diminishing long-term sustainability in coastal fisheries.

98 FAO. (2023). FAO highlights importance of fisheries law enforcement to curb UUI fishing at Philippines National Fisherfolk Day. Retrieved digitally from https://www.fao.org/philippines/news/detail/fr/c/1641576/

99 FAO highlights importance of fisheries law enforcement to curb UUI fishing at Philippines National Fisherfolk Day | FAO in the Philippines | Organisation des Nations Unies pour l'alimentation et l'agriculture. (n.d.). https://www.fao.org/philippines/news/detail/fr/c/1641576/

VII. COASTAL COMMUNITIES LEADING THE CHARGE FOR CLIMATE SOLUTIONS

While long-term institutional planning and reactive emergency measures are both essential to national climate resilience, extreme El Niño events repeatedly expose the gap between existing policy frameworks and actual ground-level readiness. This chapter traces the trajectory of Philippine climate governance from pre-existing policies to new executive mechanisms, identifying critical operational shortfalls in the fisheries sector while highlighting how frontline communities and civil society organizations are advocating for stronger, equitable solutions.

Governance and Policy Responses

Given the increasing impacts and risks brought about by the climate crisis, the Climate Change Commission, together with other national government agencies has led the development of policies and strategies to build up the country's capacity and prepare for climate-related disasters. The framework, now known as National Climate Change Action Plan (NCAP), was created to help enhance the country's climate resilience and to reduce climate-related hazards, such as El Niño.

However, despite the sweepingly inclusive efforts under the NCCAP, the government was still unprepared for the intensity of El Niño. Much more could have been done to limit or be prepared for damage from intense heat and scarcity of resources; therefore, shifting strategies based on assessment must be a continuous process to deal with climate-induced calamities more effectively.



Figure 13. President Ferdinand R. Marcos Jr. announcing the Executive Order No. 53 which reactivates and reconstitutes the Task Force El Niño. Source: RTVM, January 19, 2024

Recognizing that there is a need to enhance our capacities to respond to El Niño, another ad-hoc, an interagency government body was activated by the Philippine government through Presidential Executive Order No. 53, namely Task Force El Niño. Task Force El Niño is headed by the Department of National Defense and is responsible for preparing the country for El Niño-related impacts and developing a whole-of-government approach in mitigating droughts and dry spells brought about by the climatic phenomenon. The task force was activated on January 19, 2024 during the 2024 El Niño event. For the 2026 El Niño event, however, the task force was reactivated at a much later date, on September 25, 2026, three months after the World Meteorological Organization confirmed the development of an El Niño event in June 2026.

The experience of the 2024 El Niño highlights the vulnerabilities of the Philippines fisheries sector as the country faces the upcoming Super El Niño. In April 2024, the Department of Agriculture approved the importation of 25,000 metric tons of frozen pelagic fish for the final quarter of the year, primarily in anticipation of reduced supply during the closed fishing season. A[100] Fisherfolk and other groups have raised concern that such moves increase difficulties for the local fisheries sector by creating competition with imported fish at a time when the livelihoods of fisherfolk and coastal communities are already facing challenges.

The 2024 experience also exposed gaps in documenting and responding to El Niño's impacts on fisheries and coastal communities. Former Department of Agriculture Secretary Leonardo Montemayor has highlighted the underreporting of damage caused by El Niño.[101] There is a noticeable lack of transparency regarding El Niño's impacts on the fisheries sector, which is especially true for the affected fisherfolks, whose numbers are usually treated in lump sums with those of farmers, even though these are two significantly varying groups.

On April 22, 2024 multisectoral groups held a press conference[102] on Earth Day calling on the Marcos administration to declare a national climate emergency amid the intensifying impacts of El Niño. The groups highlighted the effects of extreme heat and prolonged dry conditions on livelihoods, food security, water resources, and vulnerable communities and called for stronger government action to address both immediate impacts and longer term climate risks.

The groups described the 2024 as the worst the country had experience and have underscored that recognizing a national climate emergency should go beyond a formal declaration but rather be accompanied by a stronger climate mitigation and resilience measures, adequate and accessible finance and swift allocation of resources to protect communities and livelihoods from escalating climate-related impacts, as illustrated by El Niño and other climate hazards. The groups also emphasize the need for longer-term measures, including transitioning away from fossil fuels and accelerated development of renewable energy to address the underlying drivers of the climate crisis.



Figure 14. Multisectoral groups held a press conference on Earth Day to urge the Marcos administration to declare a National Climate Emergency. Source: Philippine Movement for Climate Justice, 2024

100 Cariaso, B. (2024, April 25). DA: Philippines to import 25,000 MT fish. Philstar.com. https://www.philstar.com/headlines/2024/04/25/2350281/da-philippines-import-25000-mt-fish

101 Cariaso, B. (2024, May 5). Ex-DA chief: El Niño damage to agriculture underreported. Philstar.com. https://www.philstar.com/headlines/2024/05/06/2352979/ex-da-chief-el-nio-damage-agriculture-underreported

102 Philippine Movement for Climate Justice. (2024, April 22). Multisectoral groups gathered on Earth Day to urge the Marcos administration to declare a national climate emergency.https://web.facebook.com/share/p/1CDEuLV3us/

Marine Protected Areas as a Climate Adaptation Measure

Fisherfolk communities are among the poorest sectors in the Philippines[103], yet the strongest champion for food security. The sector does not have enough assets to be resilient because of income inequality, limited and poor access to resources, and weak institution[104] resulting in high vulnerability levels of the already marginalized sector. Programs on climate-resilient efforts from both the national levels to the local levels are being devolved in line with the current climate landscape outlined under the Philippines Development Plan 2023-2028.[105]

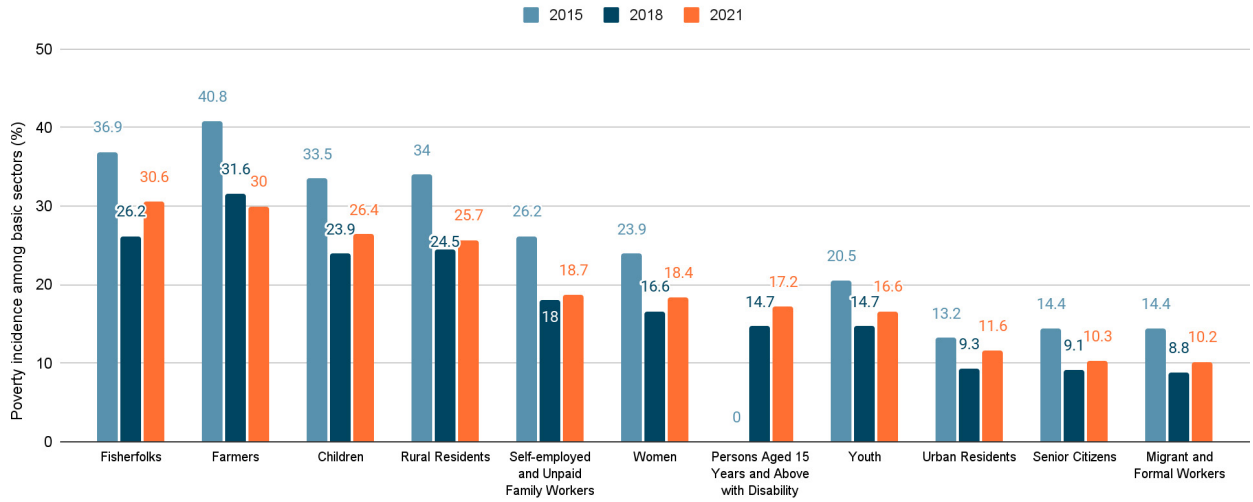


Figure 15. Poverty incidence among basic sectors (%) in the Philippines in 2015, 2018, and 2021 underscoring that fisherfolk sectors are among the poorest in the basic sectors in the country.
Source: Merged datafile of the 2015 Family Income and Exposure Survey (FIES) and January 2016 Labor Force Survey (LFS), merged datafile of the 2018 FIES and January 2019 LFS and merged datafile of the preliminary 2021 FIES and January 2022 LFS, Philippine Statistics Authority

At policy and community levels, vulnerable ecosystems such as coral reefs, seagrasses, and mangrove habitats are being declared as Marine Protected Areas in selected sites. MPAs are being implemented in the country as a fisheries management and conservation tool managed by communities and local governments to achieve local-scale fisheries and conservation goals.[106] Many locally-managed MPAs in the country are run by communities and people's organizations. As defined by the International Union for the Conservation of Nature (IUCN), MPAs are intertidal and subtidal environments reserved and protected by law or other means[107] to offer ecological and social benefits and to promote ecological networks resulting in sustained marine fisheries. Additionally, MPAs are nature-based solutions that protect habitats with their natural ability to store carbon in the atmosphere, while simultaneously strengthening resilience to climate crises.[108]

103 Philippine Statistics Authority. (2021). Fisherfolks and Farmers Remain to Have the Highest Poverty Incidences Among the Basic Sectors in 2021. Retrieved digitally from https://psa.gov.ph/system/files/phdsd/Press%20Release_5%20%281%29.pdf

104 United Nations Framework Convention on Climate Change. (2007). Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries. Retrieved digitally from https://www.preventionweb.net/go/2759

105 National Economic and Development Authority. (2022). Philippine Development Plan 2023-2028. Retrieved digitally from https://pdp.neda.gov.ph/philippine-development-plan-2023-2028

106 Horigue, V., Aliño P.M. , White, A.T., Pressey, R. L. (2012). Marine protected area networks in the Philippines: Trends and challenges for establishment and governance, Ocean & Coastal Management, Volume 64, Pages 15-26. ISSN 0964-5691, https://doi.org/10.1016/j.ocecoaman.2012.04.012

107 IUCN World Commission on Protected Areas (IUCN-WCPA). (2008). Establishing Marine Protected Area Networks-Making It Happen. IUCN-WCPA, National Oceanic and Atmospheric Administration and The Nature Conservancy, Washington, D.C.

108 Owen-Burge, C. (2022, December 1). Marine Protected Areas: Restoring, preserving, and protecting the integrity and resilience of our ocean for future generations - Climate Champions. Climate Champions. https://climatechampions.unfccc.int/marine-protected-areas-restoring-preserving-and-protecting-the-integrity-and-resilience-of-our-ocean-for-future-generations/

Figure 16. Mechanisms of MPAs in ameliorating climate change in the oceans

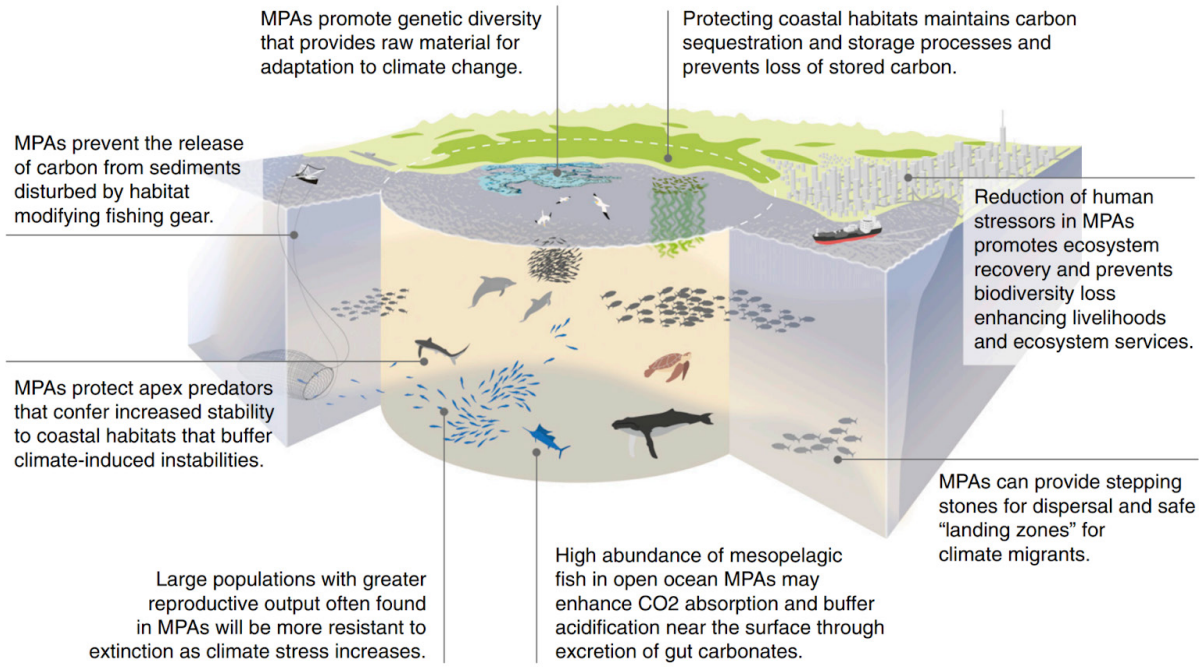


Fig. 1. Eight illustrative pathways by which MPAs can mitigate and promote adaptation to the effects of climate change in the oceans.

Source: Illustration by Roberts et al, 2017

Well-managed MPAs further aid climate resilience-building and climate mitigation by facilitating carbon sequestration and buffering extreme events, fluctuations in the environment, and directional change[109]. In the Philippines, there are over 1,800 MPAs that are mostly community-based and locally managed[110] and most protected ecosystems are coral reefs. In terms of progress of MPA management[111] noted that in the country, action towards establishing MPAs have budgetary constraints due to lack of sustainable financing which largely affects crucial MPA operations such as monitoring and law enforcement. Challenges are also faced in the implementation process, and enforcement and information gaps also need to be addressed. The study[88] also highlighted that national awards systems for well-managed MPAs boost the MPA Rating System as a tool to evaluate the protected areas and success stories in the implementation of MPAs are found in areas where methods in utilizing ecological and multi-sectoral approaches pool sustainability.

Access to Climate Finance: Essential in Building Community Resilience

Climate finance pertains to financial resources and instruments that are used to facilitate action on climate change.[112] It plays a critical role in enabling climate adaptation and resilience efforts in conflict-affected and climate-vulnerable countries.[113] Although progress has been noted during the past few years, there is still an ever-growing gap between what is needed by developing countries like the Philippines to implement their national climate plans and what exists as support.

The current climate financing mechanisms are riddled with challenges. Angelo Kairos Dela Cruz, Executive Director of the Institute for Climate and Sustainable Cities, who sits as Alternate CSO Active Observer on the Board of Green Climate Fund, emphasized in an online interview that there are critical challenges within the current climate finance system and ensuring that funds reach

109 Roberts, C.M., O'Leary, B.C., McCauley, D.J., Cury, P.M., Duarte, M.C., Lubchenco, J., Pauly, D., S´aenz-Arroyo, A., Sumailsa, U.R., Wilson, R.W., Worm, B., and Castilla, J.C. (2017). Marine reserves can mitigate and promote adaptation to climate change. Proceedings of the National Academy of Sciences (114) 24 6167-6175. www.pnas.org/cgi/doi/10.1073/pnas.1701262114

110 Department of Environment and Natural Resources. (2020). Joint DA-DENR-DILG Memorandum Circular re: Guidelines on the Establishment and Management of Marine Protected Area Networks (MPANs). Retrieved digitally from https://apidb.denr.gov.ph/infores/uploads/MEMO-2020-437.pdf

111 Maypa, A.P., White, A.T., Cañares, E., Martinez, R., Eisma-Osorio, R.L., Aliño, P., and Apistar, D. (2012). Marine Protected Area Management Effectiveness: Progress and Lessons in the Philippines. Coastal Management, (40)5, 510-524

112 What is climate finance and why do we need more of it? (n.d.). UNDP Climate Promise. https://climatepromise.undp.org/news-and-stories/what-climate-finance-and-why-do-we-need-more-it

113 Eu, I. I. T. (2024, March 8). Why is climate finance so important? The IRC in the EU. https://www.rescue.org/eu/article/why-climate-finance-so-important

intended communities. Despite the availability of funds, bureaucratic processes, and accreditation requirements often hinder access for communities. Dela Cruz also highlighted communities might be required to scale up projects just to meet funding criteria. This could mean aggregating smaller initiatives, but the process of aggregation in itself is challenging which involves difficult negotiations and requires clear ideation.

Even with the presence of available funds, it is notable that only two coastal rehabilitation and management projects have so far been approved in the People's Survival Fund – an annual fund intended for local government units and local or community-based organizations anchored in providing climate change adaptation activities: one in 2016 and 2023. In contrast, there were a total of 13 proposals submitted in 2016, and 180 projects in 2023— a clear case of how communities cannot access the available funds; it is these barriers such as the one previously mentioned that impede the effective use of these resources, hence making funds elusive for many communities.

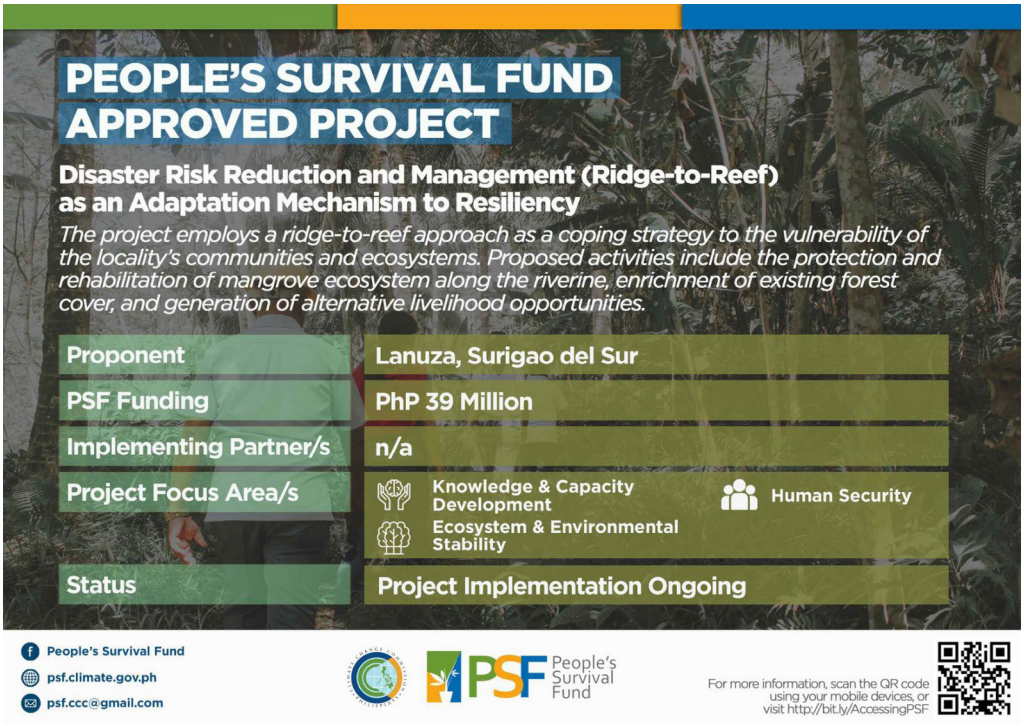


Figure 17. Lanuza, Surigao del Sur entitled 'Disaster Risk Reduction and Management (Ridge-to-Reef) as an Adaptation Mechanism to Resiliency'. Source: Climate Change Commission, 2016



Figure 18. Project Location of Mangrove Rehabilitation Project in Catanauan, Quezon worth PHP 2.63 million
Source: Handbook of Mangrove Resources in Pagbilao and Catanauan, Quezon.

With PHP 9.89 billion in agricultural damages, and with the faucet now open on loss and damage funds, the need for building community resilience has never been greater—but major challenges remain in living up to lofty expectations. Loss and damage are considered residual risks that persist despite comprehensive adaptation efforts. Too often, the problem is that very little has been done at all to adapt. Additionally, the technical expertise for effective financing is very high. In theory, loss and damage can be measured given the data present on damages and the frequency of an event. The challenge in telling it is attribution science that will pinpoint certain damages to be attributed to the climate crisis. Dela Cruz emphasized that while developing said attribution science, interim measures should be implemented such as climate and disaster finance and insurance. These kinds of measures would provide immediate relief without waiting for a long process. For instance, the operation of both parametric and indemnity insurance could help in offering timely support to the affected communities, ensuring that it does not have to choose between the type of aid if comprehensive options exist.

Moreover, Dela Cruz added that there is a consensus that targeting interventions and beneficiaries for climate finance projects is a challenge. However, a significant gap exists in community engagement, as evidenced by the lack of proposals from community organizations to the People's Survival Fund (PSF) since its inception. Encouragement of community organizations to submit proposals could help bridge this gap and ensure that funding priorities more closely meet community needs.

Despite the challenges, there is optimism for the improvement of these mechanisms in the future. People familiar with community needs must argue for their sake in including them formally in climate finance processes, balancing access with accountability. While the Green Climate Fund has set high expectations, the PSF opened opportunity for community engagements on a more accessible level. It will also help future initiatives to be much more appropriate for addressing the vulnerabilities or needs of climate change-affected communities by encouraging community organizations to submit proposals and support in developing them.

VIII. CONCLUSIONS AND RECOMMENDATIONS

The onslaught of El Niño in the Philippines emphasizes the multifaceted and intensifying challenges brought by the climate crisis. These impacts endanger not just agricultural productivity, water resources, livelihoods, and public health; but also compound vulnerabilities already existing within most marginalized communities. With the impacts of El Niño, the Philippine Government must prepare to prevent impacts as the country braces for more and stronger El Niño, and as the world confronts worsening manifestations of the climate crisis.

Our experience of El Niño revealed gaps in our national and local climate response, and stressed the need for more robust monitoring, and science-based and people-centered response strategies to safeguard biodiversity and vulnerable populations. The following recommendations are presented in contribution to this discourse:

1. **Adopt a holistic Ridge-to-Reef approach to increase the country's climate resilience through integrated watershed management from mountains, to riverine environments, up to mangroves to coral reefs.** This approach protects watersheds, restores degraded landscapes, enhances water retention, and reduces soil erosion, contributing to more reliable water supplies during El Niño-induced droughts. It should be supported by integrated land-use planning and zoning regulations that recognize watersheds, rivers, wetlands, and coastal ecosystems as interconnected water-resource systems. Local governments, particularly those sharing river basins and coastal watersheds, should coordinate their land-use plans and conservation initiatives to protect critical water sources and prevent incompatible development.

   The approach must also recognize the role of coastal and marine ecosystems in climate adaptation. Mangroves, wetlands, and coral reefs provide important ecosystem services. Protecting these ecosystems alongside upstream watersheds helps maintain ecological functions and sustain the livelihoods of communities that depend on them.

2. **Expand and strengthen the implementation of Marine Protected Areas, including the identification of key biodiversity hotspots and vulnerable marine ecosystems for protection under the Expanded National Integrated Protected Areas System (ENIPAS).** The designation of biodiversity hotspots such as the Verde Island Passage (VIP) under E-NIPAS would establish a more comprehensive and coordinated management framework for this ecologically significant marine corridor. This would strengthen biodiversity conservation, promote sustainable fishing practices, and protect the ecological functions that support the resilience and livelihoods of coastal communities.

   The establishment and effective management of MPAs must be accompanied by adequate and sustained funding, improved scientific and socioeconomic information, strengthened enforcement, and the meaningful participation of fisherfolk, Indigenous Peoples, local communities, and other basic sectors in coastal governance and decision-making. Protection must go beyond formal designation and ensure that management plans are implemented, monitored, and supported by sufficient institutional capacity.

As of November 2026, House Bills 132[114], 8847[115], 882[116], and 10510[117] have been filed in the House of Representatives seeking to declare the VIP as part of E-NIPAS. Advancing this legislation is an important step to halt expansion of fossil fuel infrastructure and other potentially destructive activities, including large-scale mining and illegal fishing, within and around the marine corridor

3. **Strengthen the National Action Plan on El Niño and the National Climate Change Action Plan (NCCAP) through proactive, sustained, and adequately financed interventions that address slow-onset disasters and their cascading socioeconomic impacts.** Government planning and disaster risk reduction programs must move beyond predominantly reactive relief and emergency response toward anticipatory action, preparedness, and long-term resilience. Unlike rapid-onset disasters, droughts and prolonged heat develop gradually, with their effects accumulating across agriculture, fisheries, water resources, energy supply, public health, and household incomes. Consequently, interventions must be triggered by climate forecasts, drought indicators, reservoir levels, agricultural assessments, and other early-warning information before impacts become irreversible.

   National Government Agencies should strengthen coordinated drought contingency planning. This should include pre-positioning agricultural inputs, providing early financial assistance to at-risk farmers and fisherfolks, establishing water allocation protocols, and activating livelihood and food assistance when predetermined climate-risk thresholds are reached.

   Importantly, these interventions must be backed by dedicated fiscal buffers and responsive social protection mechanisms. National and local governments should establish or strengthen contingency financing arrangements that can be rapidly mobilized to support affected agricultural workers, fisherfolk, and low-income households. These may include emergency cash transfers, crop and fisheries insurance, livelihood recovery assistance, food subsidies, and temporary employment programs. Funding should be integrated into national and local climate adaptation and disaster risk reduction budgets, with transparent allocation and accountability mechanisms.

4. **Promote solutions combining nature-based solutions with strategic infrastructure investment in building long-term resilience, and adaptability in urban and rural communities.** Nature-based solutions, including mangrove rehabilitation, wetland restoration, watershed protection, and coral reef conservation, provide essential ecosystem services that help reduce flooding, coastal erosion, wave impacts, and other climate-related risks. These interventions should complement, rather than replace, investments in critical infrastructure that address the immediate and long-term needs of vulnerable communities.

   Infrastructure investments should prioritize climate-resilient irrigation systems, water storage facilities, rainwater harvesting, efficient drainage networks, and reliable rural transportation infrastructure. In agricultural communities, these investments can help sustain crop production during prolonged dry spells, improve water availability, and maintain access to markets and essential services despite climate-related disruptions.

114 House of Representatives. Rep. Arnan C. Panaligan. (June 2025). HB00132 An Act Declaring the Verde Island Passage in the Provinces of Batangas, Marinduque, Occidental Mindoro, Oriental Mindoro, and Romblon, A Protected Area with the category of Protected Seascape under the National Integrated Protected Areas System (NIPAS). https://docs.congress.hrep.online/legisdocs/basic_20/HB00132.pdf

115 House of Representatives. Rep. Javier Miguel Lopez. (April 2026) HB08847 An Act Declaring the Verde Island Passage in the Provinces of Batangas, Marinduque, Occidental Mindoro, Oriental Mindoro, and Romblon, A Protected Area with the category of Protected Seascape under the National Integrated Protected Areas System (NIPAS) https://docs.congress.hrep.online/legisdocs/basic_20/HB08847.pdf

116 House of Representatives. Rep. Leila De Lima (April 2026). HB08882 An Act Declaring the Verde Island Passage in the provinces of Batangas, Marinduque, Occidental Mindoro, Oriental Mindoro, And Romblon, A Protected Area with the category of Protected Seascape under the National Integrated Protected Areas System (NIPAS), to be referred to as the Verde Island Passage Protected Seascape (VIPPS) https://docs.congress.hrep.online/legisdocs/basic_20/HB08882.pdf

117 House of Representatives. Rep. King George Leandro Antonio Valencia Collantes. (August 2026) Declaring the Verde Island Passage in the Provinces of Batangas, Marinduque, Occidental Mindoro, Oriental Mindoro, and Romblon, A Protected Area with the category of Protected Seascape under the National Integrated Protected Areas System (NIPAS). https://docs.congress.hrep.online/legisdocs/basic_20/HB10501.pdf

NGAs should ensure that infrastructure development is guided by climate risk assessments and integrated watershed and land-use plans. Investments must also consider the needs of small-scale farmers, fisherfolk, and geographically isolated communities to ensure that infrastructure improvements translate into more equitable access to resources, services, and livelihood opportunities.

5. **Establish "no-go" zones for fossil fuel expansion in critical biodiversity areas such as the Verde Island Passage.** An estimated 16% of protected areas in the Coral Triangle are overlapped by oil and gas blocks.[118] Pollution, biodiversity loss, and decline in ecosystem quality brought about by fossil fuel operations has heightened the vulnerability of coastal communities to extreme weather events. Further expansions in high biodiversity but critically vulnerable areas such as the VIP act as impact multipliers that exacerbate the existing climate related hazards these communities already face. Establishing clearly delineated "no-go" zones in key biodiversity areas serves as a preventive approach that not only protects biodiversity but helps increase the adaptive capacity of vulnerable coastal communities to weather extreme climate events such as El Niño.

   Establishing no-go zones is a preventive measure that protects biodiversity, safeguards ecosystem services, and reduces additional environmental pressures on vulnerable coastal communities. It should also complement the expansion of MPAs and the proposed inclusion of the VIP under E-NIPAS.

6. **Empower communities, people's organizations and basic sectors in accessing and directly benefiting from climate finance initiatives.** Climate finance must reach the communities experiencing the impacts of climate change, rather than remain concentrated in national institutions and large implementing organizations. This entails providing communities with the necessary resources, technical assistance, institutional support, and financial management capacities to access programs such as the People's Survival Fund (PSF), the Fund for Responding to Loss and Damage (FRLD), and relevant local climate and disaster risk reduction funds.

   Community members should be meaningfully involved throughout the entire project cycle, from identifying vulnerabilities and establishing priorities to developing proposals, implementing projects, and monitoring outcomes. Particular attention should be given to addressing barriers that prevent small community organizations, fisherfolk associations, and other grassroots groups from accessing climate finance, including complex application requirements, accreditation processes, limited technical capacity, and the need for counterpart funding.

7. **Promote solutions that advance both national climate mitigation and adaptation while unlocking potentials for diversification and resilience of livelihoods in coastal communities.** Beyond addressing immediate challenges such as water scarcity and declining fish catch, investing in renewable energy can facilitate economic diversification and strengthen the resilience of vulnerable communities. The deployment of renewable energy technologies can create employment opportunities in clean energy, stimulate local economic activity, and reduce dependence on fossil fuel price fluctuations and supply disruptions.

   In coastal areas heavily reliant on fishing, where rising sea temperatures and changing marine conditions can disrupt ecosystems and fishing livelihoods, renewable-powered technologies can provide practical adaptation solutions. Solar-powered ice-making and cold storage facilities can help preserve fish catch, reduce post-harvest losses, and improve fisherfolk's access to markets. Meanwhile, appropriately designed solar-, wind-, or wave-powered desalination and water pumping systems can help address freshwater shortages in geographically isolated and water-stressed coastal communities.

118 Earth Insight, SkyTruth. (2024). Coral Triangle at Risk: Fossil Fuel Threats and Impacts.

Renewable energy investments must also be integrated into broader livelihood development strategies. Communities should be provided with education, skills training, and resources to participate in renewable energy operations, maintenance, and related enterprises to ensure that the energy transition generates tangible economic benefits while simultaneously reducing emissions and strengthening local adaptive capacity.

8. **Develop a comprehensive Transition Away From Fossil Fuel (TAFF) roadmap[119] that covers all types of fossil fuels.** TAFF is an emerging global policy framework that adopts a more comprehensive and holistic approach to energy transition by integrating biodiversity protection, climate adaptation, and resilience into its framework. It is a long-term climate-resilience and adaptation strategy that can potentially complement El Niño adaptation measures in the country. This transitions that country's disaster risk and management plans from one that is primarily reactive - focusing on disaster response - to one that is pro-active and preventive. This approach addresses structural vulnerabilities and risk drivers, and builds up the adaptive capacity of coastal communities to weather not only El Niño events but the broader impacts of the global climate crisis.

119 COP30 Presidency, Transition Away from Fossil Fuels Roadmap (2026) https://cop30.br/en/news-about-cop30/roadmap-taff

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