

# Socioeconomics and Climate-Related Threats in the Philippine Seas in the South China Sea Large Marine Ecosystem

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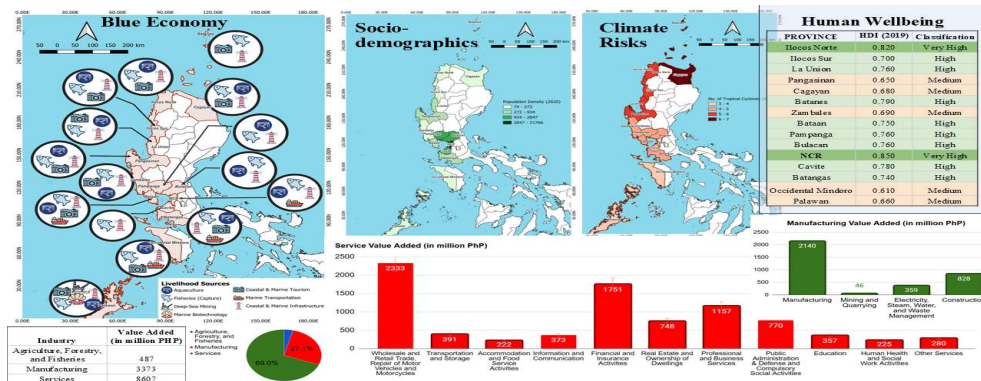
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## Abstract

The South China Sea Large Marine Ecosystem (SCS-LME) is a biologically diverse tropical marine area that is vital to the surrounding coastal countries due to its high biodiversity and significant role in global fisheries, providing essential food security and economic benefits. However, these benefits are greatly affected by sociodemographic and environment-related threats contributing to the Triple Planetary Crisis: climate change, pollution, and biodiversity loss. This chapter presents the current status of the demographics, human well-being, and climate-related risks in the Philippine Seas in the SCS-LME. Using provincial data as a sub-national unit, this chapter analyzes these indicators focusing on the coastal provinces along the SCS-LME. Results found that the National Capital Region (NCR) has the highest population density at 21.7 thousand/sqm, followed by surrounding provinces, which provide better access to basic goods and services and more social and economic opportunities, reflecting a high human development index (HDI). While HDI trends are increasing from 2006-2019 across different localities, high poverty incident rates are observed in island provinces, such as Occidental Mindoro and Palawan, along with areas far from NCR like Pangasinan and Zambales. In terms of the blue economy, most of the industries and services are centered in these areas while food production particularly, agriculture, forestry, and fisheries are situated in rural and island provinces. Moreover, all provinces are vulnerable to various hazards and disasters, increasing the risks to the exposed population and capital across various localities. These are exacerbated by uncontrolled and excessive urbanization, particularly in NCR and neighboring provinces, which can lead to higher vulnerability to the impacts of climate change. The risk assessments from sociodemographic trends and climate- and environment-related threats provide bases for recommended mitigation measures and priority actions to build resilience and ensure sustainable and inclusive development in the localities along the SCS-LME.

**Keywords:** blue economy; climate change; human development; large marine ecosystem; socioeconomic

## Graphical Abstract



## 2. Socioeconomics and Climate-Related Threats

The South China Sea Large Marine Ecosystem (SCS-LME) is a vital source of food, livelihood, and economy for several countries surrounding it, which are home to about 270 million people. The SCS-LME is heavily fished and the main source of animal protein for East and Southeast Asian regions. There are large reserves of oil and natural gas being utilized and still explored under its seafloor. It also serves as a hub for the blue economy containing some of the world's most important shipping routes, ocean transport and shipping ports, fishing industry, renewable (offshore wind) energy, coastal tourism, and community fishing ports.

However, these economic activities are facing challenges related to sociodemographic and climate and disaster risks. For instance, the rising sea levels, driven by climate change, can lead to coastal erosion and inundation, threatening infrastructure, water security, and food security, which is particularly problematic for communities that rely on marine resources for their livelihoods (Mishra, Gupta & Verma, 2025). Coastal areas are increasingly vulnerable to extreme weather events such as hurricanes, tsunamis, and storm surges as well as oil spillage, which can cause significant physical damage to marine and coastal ecosystems and disrupt local economies (Agaton et al., 2025; Laino & Iglesias, 2023). Meanwhile, the growing population and economic activities increase the number of people at risk from climate impacts with low-income coastal communities being particularly vulnerable due to limited adaptive capacity and reliance on natural resources for livelihoods (Yuan, Beard & Johnson, 2021). These are exacerbated by unregulated urban growth and development in coastal areas, particularly in developing and island countries, resulting in an increased pressure on ecosystems and reducing resilience to natural hazards (Tsilimigkas, Deligianni & Zerbopoulos, 2016). Moreover, challenges such as geopolitical tensions, overfishing, and habitat degradation hinder efforts to achieve sustainable economic growth in the region.

This component summarizes the sociodemographics, human well-being, blue economy, and climate-related threats, which are essential for formulating strategic actions, both at national and regional levels. The sub-national unit of analysis used in the study covers the data from provinces along Philippine Seas in the SCS-LME. The risk assessments from sociodemographic trends and climate- and environment-related threats provide bases for recommended mitigation measures and priority actions to build resilience and ensure sustainable and inclusive development.

### 2.1 Key Findings

- **Demographics** - The majority of the growing populations are situated in the National Capital Region (NCR) and its nearby provinces, which provide better access to basic goods and services, along with more social and economic opportunities. On the other hand, island provinces and those situated in farther regions from NCR, remain with fewer populations despite having vast land areas and natural resources.
- **Human Well-Being** - Ilocos Norte and NCR have very high human development index (HDI), while the rest of the localities have high and medium HDIs. Improving literacy rates and declining poverty incidences are expected to increase the HDI in the next years.
- **Blue Economy** - Most of the industries and services are centered in NCR and its nearby provinces, because of urban growth expansion from the metropolitan area. Food production is situated in rural areas, prioritizing agriculture, forestry, and fisheries for economic development.
- **Climate-Related Threats** - All localities are exposed to various hazards and disasters. Aside from the geographic location of the Philippines, continuous land conversions, illegal agricultural and fishing practices, mining and quarrying, improper waste management, congestion, and pollution, among others, result in environmental degradation. As such, there is little to no natural protection against hazards and disasters. Population and capital are increasingly exposed across various localities.

## 2.2 Current Status by Indicator Group

This section details the current status of the demographics, human well-being, blue economy, and climate-related threats for the provinces in the Philippine Seas in the SCS-LME.

### 2.2.1 Demographics

The Philippines has a total population of 109,035,343 in 2020. This makes the country ranked the 13th most populous nation across the globe and the second most populous country in the Association of Southeast Asian Nations (ASEAN) (Philippine Statistics Authority (PSA), 2021). Among the localities covering the Philippine Seas in the SCS-LME, NCR ranked the highest while Batanes ranked last in terms of population. Although all localities showed an increase in the population from 2015 to 2020, NCR and its nearby provinces like Cavite and Bulacan showed the most rapid population growth (PSA, 2020). Moreso, these most populous localities have smaller land areas; thus, higher population density that lead to congestion (Figure 2.1).

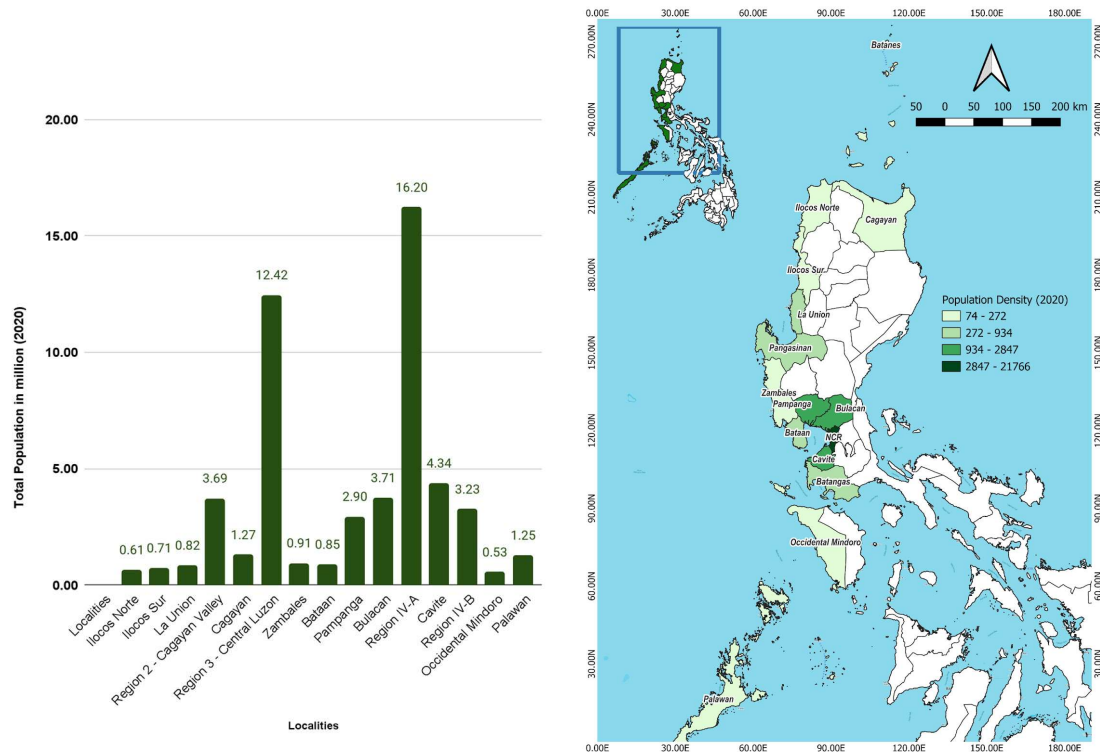
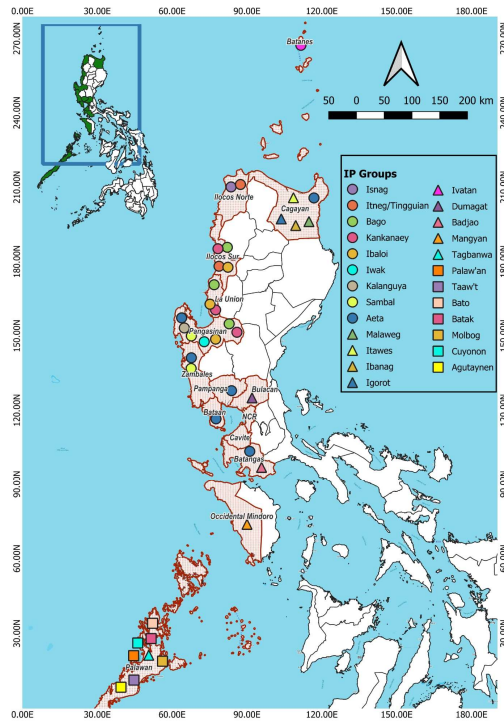


Figure 2.1. Population Data of Localities in 2020 (PSA, 2020)



**Figure 2.2.** Indigenous Peoples (IP) Groups in Different Localities (PSA, 2020)

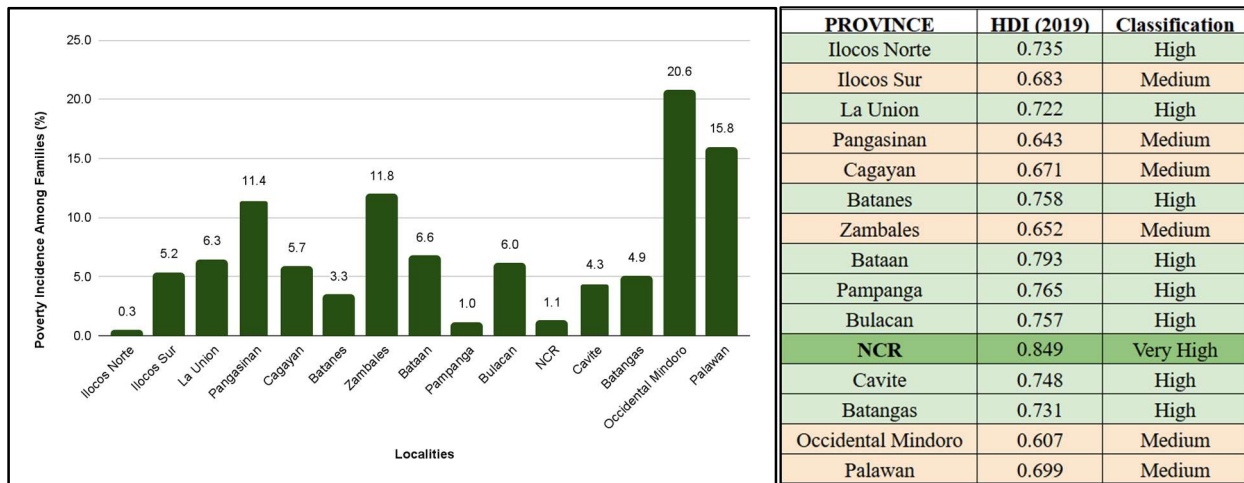
Studies also revealed that majority of the world’s population/ households opt to live in urban areas (Dodman *et al.*, 2023). Reasons include more access to services and opportunities, including technologies, telecommunication (D’Acci, 2021), transportation, and employment (Moro *et al.*, 2021). However, due to limited land area for the growing population, common practices include the conversion of forests and agricultural lands to residential, commercial, and industrial needs. If uncontrolled, this may lead to degradation of natural resources; hence, poor ecosystem services. Current manifestations include global warming, more intense and frequent disasters, poor sanitation, less access to safe water, and increased demand, yet lower supply of food (Dodman *et al.*, 2023).

On the contrary, rural provinces like Batanes have lower population. People are not attracted to live here since these will require more energy and resources to access different goods and services (Talubo & Saroj, 2019). Given the insufficient human capital and local budget, access to water supply (Aquino, Sanchez, & Roa, 2023), electricity, sanitation, and other essentials have been major issues in these localities. Although there are vast natural resources capable of providing more provision services for a smaller human population, due to geographic location, Batanes and similar island provinces are prone to many hazards and disasters, including earthquakes and typhoons (Hadlos *et al.*, 2023); thus, often resulting in socio-economic losses. Similar experiences can be observed by IPs situated in far-flung areas of provinces within SCS-LME (Macusi *et al.*, 2023) (Figure 2.2).

## 2.2.2 Human Wellbeing

Assessing the status of human wellbeing is also important consideration in developing strategic plans for SCS-LME as this recognizes the equitable access to diverse ecosystem services it provides and the socioeconomic impacts of conservation initiatives. Using different dimensions of human wellbeing, planners and policymakers can proactively understand future impacts of marine management decisions and co-create solutions with various stakeholders to ensure that marine conservation initiatives improve the welfare of the communities while attaining sustainable development goals (SDGs).

As per Republic Act No. 8425 of 1997, also known as Social Reform & Poverty Alleviation Act of the Philippines, the Department of Economy, Planning, and Development (DEPDev) defines poor families as households whose per capita income or expenses are lower than the per capita national family poverty threshold of Php 13,873 or USD 250 per month for a family of five (PSA, 2023, 2024). Among the localities covered by Philippine Seas in the SCS-LME, Ilocos Norte, Pampanga, and NCR have the least recorded poverty incidences, while Occidental Mindoro and Palawan have the highest (Figure 2.2). Priority programs, projects, and activities (PPAs) in Ilocos Norte included poverty reduction, improved agricultural productivity, and employment opportunities. This contributed to why the province had the least poverty incidence recorded (Adriano, 2024). On the other hand, economic development, especially in NCR and its nearby provinces, including Pampanga, aided in more access to basic goods and necessities to alleviate poverty (Ayoo, 2022). As for island provinces such as Occidental Mindoro and Palawan, studies showed that geographic isolation is a huge factor for less accessibility to basic goods and services (Deziel *et al.*, 2023; Zhou & Huang, 2023).



**Figure 2.3.** Localities' Poverty Incidence Among Families in 2023 (PSA, 2020; 2023)

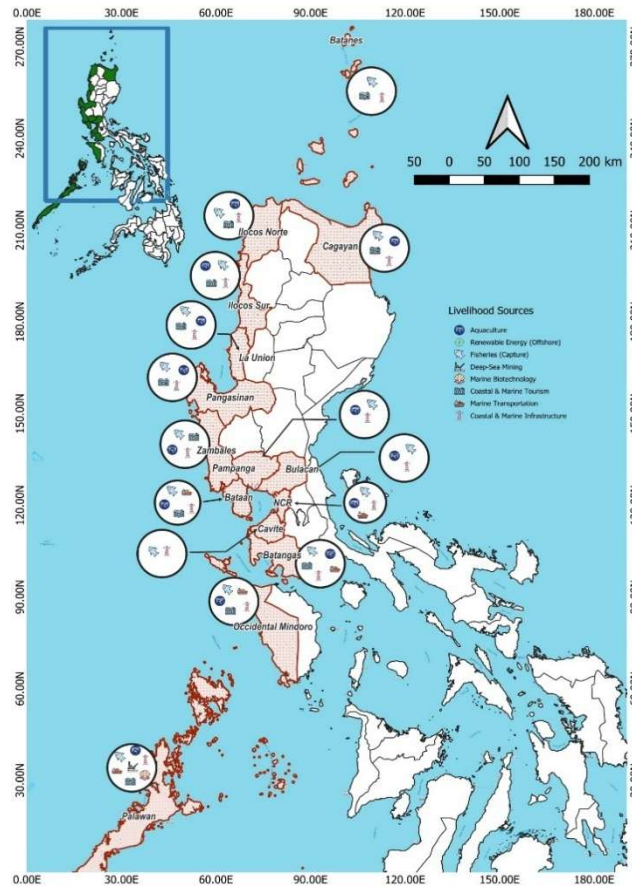
Human Development Index or HDI, as a key metric of the United Nations (UN) for measuring human well-being and quality of life, uses indicators/ elements including per capita income, education, and life expectancy (Qori'atunnadyah, 2023). Following the United Nations Development Programme (UNDP) HDI classifications (very high:  $\geq 0.800$ ; high: 0.700-0.799; medium: 0.550-0.699; low:  $< 0.550$ ), report by Human Development Network Foundation Incorporated (HDNFI) showed that NCR has very high HDI. Ilocos Norte, La Union, Batanes, Bataan, Pampanga, Bulacan, Cavite, and Batangas have high HDI results, while Ilocos Sur, Pangasinan, Cagayan, Zambales, Occidental Mindoro, and Palawan have medium HDIs (Figure 2.3).

Considering that the majority of the localities mentioned focused on economic development, as supported by the demographic results and analysis, this may have contributed to an increase in per capita income. Increase in income level also aided to longer life expectancy caused by improved access to health care services and nutrition. However, this may have been feasible through improved quality education, as the majority of higher-income jobs may apply to those with better educational backgrounds/ completed primary, secondary, tertiary, and/or postgraduate studies (Sart *et al.*, 2024).

### 2.2.3 Blue Economy

Blue economy refers to the sustainable use of ocean resources for economic growth, jobs, ocean health, and to improve livelihoods (Narwal *et al.*, 2024). It is composed of eight key sectors which all aim at using marine resources sustainably for economic growth and human well-being. These include (i) fisheries, (ii) aquaculture, (iii)

marine transportation, (iv) coastal and marine tourism, (v) deep-sea mining, (vi) coastal and marine infrastructure, (vii) renewable energy, and (viii) marine biotechnology.



**Figure 2.4.** Blue Economy in Different Localities

As shown in Figure 2.4, all localities covered by Philippine Seas in the SCS-LME have coastal and marine infrastructure, which also aid in transportation and other economic activities. Among the major seaports are the Ports of Manila, Batangas, Subic (Zambales), San Fernando (La Union), and Irene (Cagayan), which serve as maritime transport hubs for local and international shipping industry.

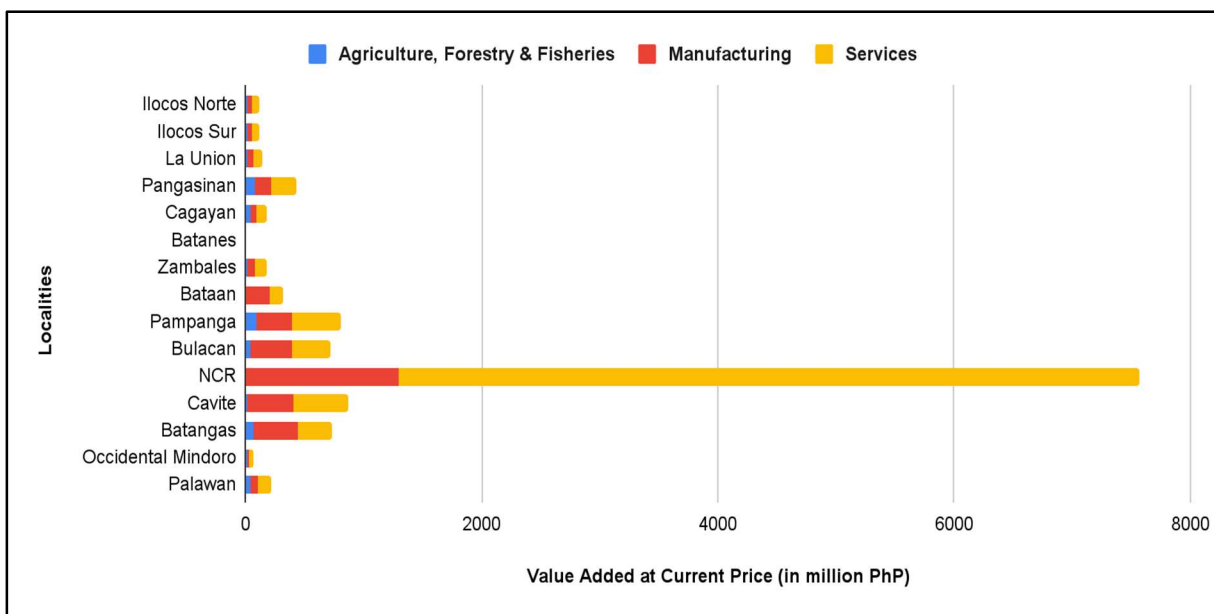
Blue economy sectors common to the majority of the localities include coastal & marine tourism, aquaculture, and fisheries. On the other hand, deep-sea mining and marine biotechnology were evident in Palawan.

In terms of renewable energy, the World Bank estimated a 178 GW potential of offshore wind, which can significantly contribute to the country's climate goal and renewable energy target of 50% share by 2040. The Department of Energy (DoE) identified the potential offshore wind development zones in SCS-LME area such as Northwest Luzon (2-5 GW), NCR (up to 3 GW), Northern Mindoro (3-10 GW), and Southern Mindoro (20-36 GW).

Many Pacific countries recognize that in analyzing the total impacts of blue economy, ridge-to-reef approach has to be used due to interconnectedness of various sectors and their ecosystem services, including activities in the uplands which then affect the quantity and quality of services provided in the coastal areas and vice versa (Fache & Pauwels, 2022). Hence, all economic sectors comprising a locality were divided into (1) agriculture, forestry, and fisheries; (2) manufacturing, and (3) services. All of these were analyzed below.

Provinces such as Pampanga, Pangasinan, and Batangas have the highest value added at current price (2023) in terms of agriculture, forestry, and fisheries. This is evident considering that these provinces rely on the said economic ventures as primary sources of income/ livelihood (Provincial Government of Pampanga, 2013; Province of Batangas, 2021). On the other hand, Batanes, although a known rural area, had low values due to extreme weather conditions, which are not suitable for these economic activities (Hadlos *et al.*, 2023).

For manufacturing and services, NCR and its nearby provinces have the highest value added at current prices since these economic activities, requiring much energy, labor, and other resources, are attributed to metropolitan and urban areas. On the other hand, mining and quarrying, often in mountainous areas, are known only in selected rural areas such as Palawan and Zambales since these activities are not actively being promoted (Pascual *et al.*, 2022) because of numerous negative impacts. Moreover, Palawan LGU approved the ordinance on a 50-year mining moratorium due to increasing environmental concerns brought about by illegal mining and quarrying in this biodiversity hotspot (Ticke & Lagare, 2025).



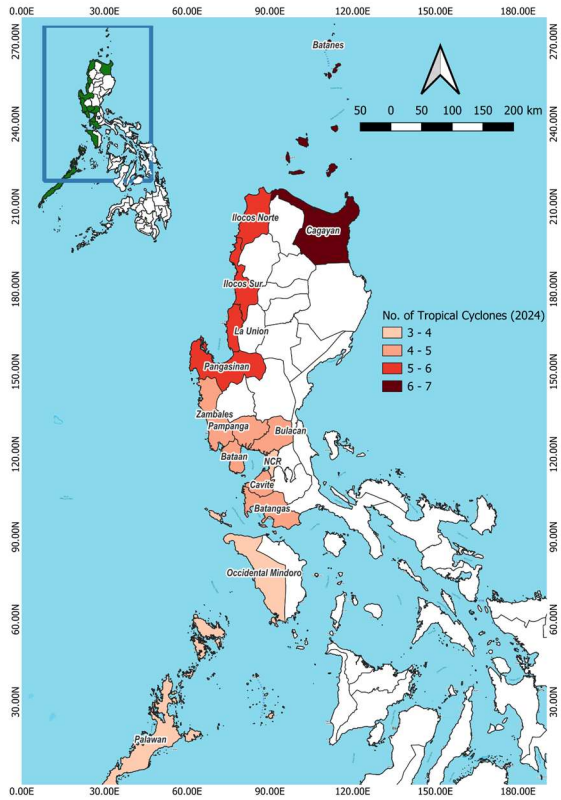
**Figure 2.5.** Value Added at Current Prices in 2023 of Economic Sectors in Different Localities (PSA, 2025)

### 2.2.4 Climate-Related Threats

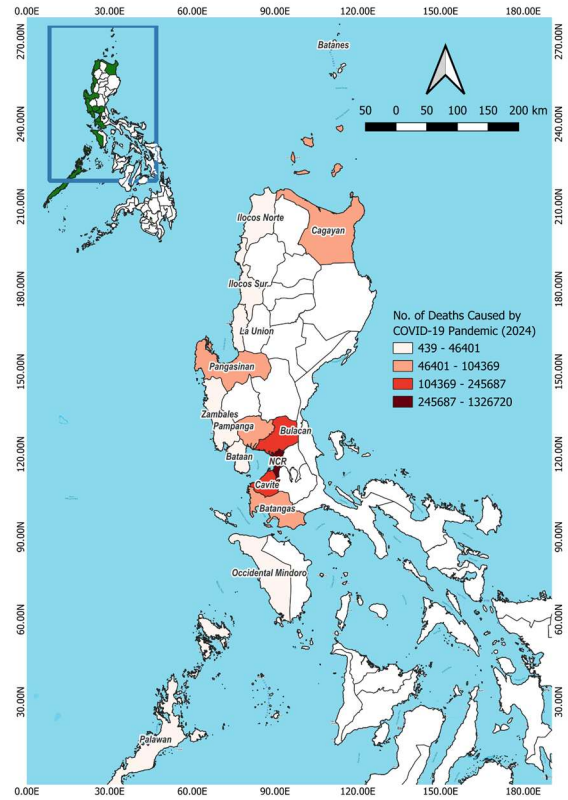
According to the Department of Science and Technology-Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA) (2025), the Philippines has the largest number of tropical cyclones (TCs) entering the country per year than any other nation across the globe. This is shown in the map below, with localities surrounded by bodies of water experiencing frequent tropical cyclones and typhoons. The majority are in the northern part of Luzon, namely, Cagayan and Batanes, followed by Ilocos Norte, Ilocos Sur, La Union, and Pangasinan. Among these localities with Philippine Seas in the SCS-LME, NCR had the lowest number of TCs in 2024, yet still with the recorded 7 deaths. Batangas had the highest with 64 declared dead people. The majority of this was caused by Tropical Cyclone Trami (Kristine). The high population density and concentration of service infrastructure in the NCR and its nearby provinces can result in huge economic negative impacts if not properly mitigated.

In terms of the COVID-19 pandemic record of the Department of Health or DOH (2024), NCR had the highest recorded deaths, while Palawan, Occidental Mindoro, and Batanes had the lowest (Figure 2.7). This is evident

considering that NCR suffers from congestion (Lagundimao *et al.*, 2024); hence, higher exposure and contact with different people. On the other hand, island provinces are isolated and do not attract many migrants (Deziel *et al.*, 2023; Zhou & Huang, 2023). Hence, there is less entry and spread of the virus.



**Figure 2.6.** Number of Tropical Cyclones Affecting Localities in 2024 (CRED/UC Louvain, 2025)

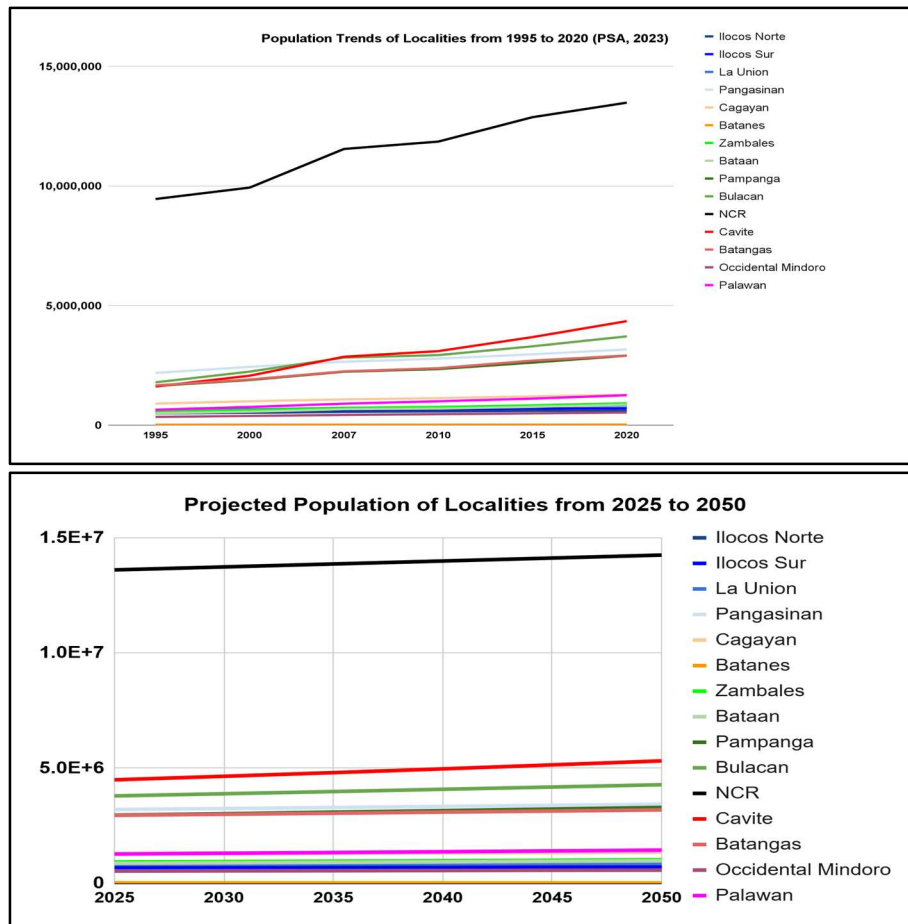


**Figure 2.7.** Number of Deaths Caused by COVID-19 Pandemic in Different Localities (DOH, 2024)

## 2.3 Discussion and Conclusions

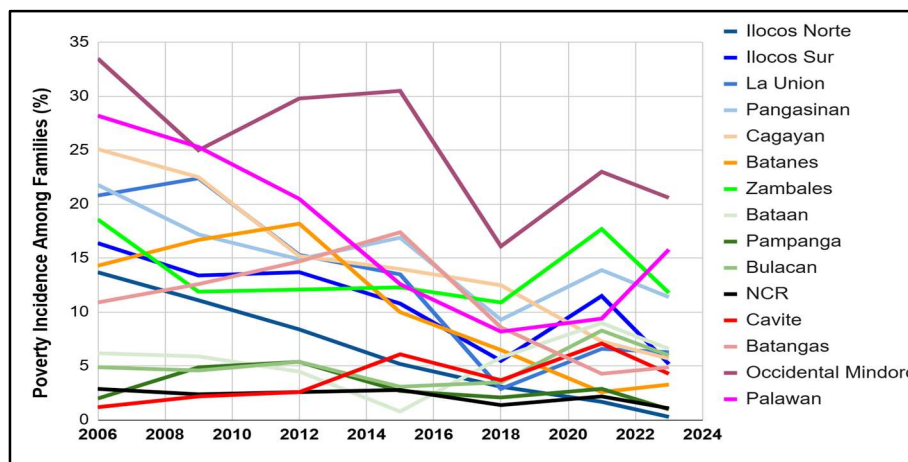
### 2.3.1 Risk Assessment from Socioeconomic Trends

All of the local government units (LGUs) show increasing populations and it is still expected to grow in the coming years as shown in the figure below. However, NCR has a significantly higher population compared to other localities. This is given considering that it is composed of 16 cities and a municipality (PSA, 2025), and the majority of the population wanted to live in urban areas (Czaika & Reinprecht, 2022). Despite this, population increases in a slower pace over the past years. According to Gu *et al.* (2021), this is attributed to declining fertility rates. Among the factors include education, exposure of women to mass media, access to anti-fertility drugs, and employment/career priorities (Borzoiepour *et al.*, 2024).



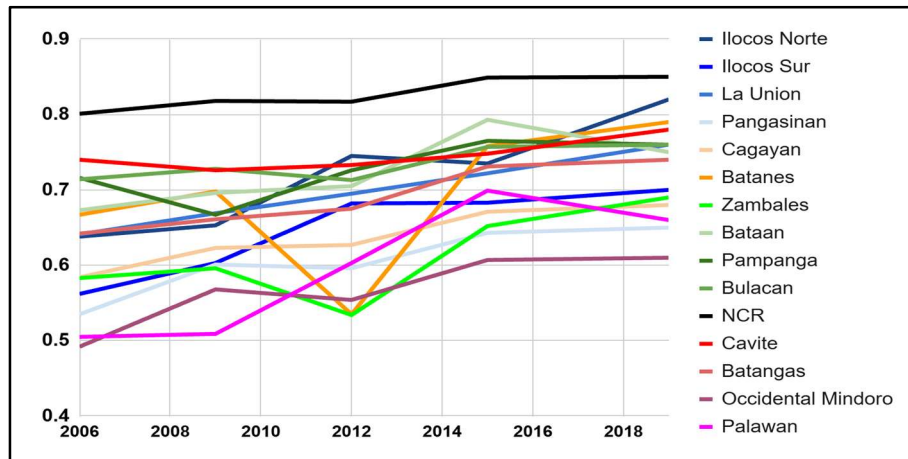
**Figure 2.8.** Population Trends and Projections of Localities from 1995 to 2050 (PSA, 2023)

Such access to information, education, and technology may also be a factor for decreasing overall poverty incidences in different localities. However, in the figure below, it can be observed that a sudden increase in poverty incidences occurred in 2021. This may be attributed to the COVID-19 pandemic, wherein many households suffered from less access to income/employment (Lavado et al., 2021). Many establishments and businesses shut down; hence, little to no money for food (Angeles-Agdeppa et al., 2022) and other necessities.



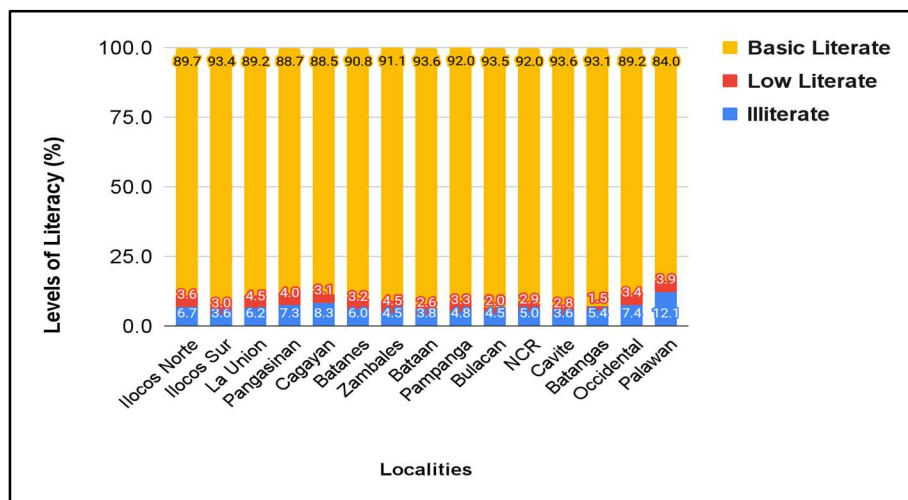
**Figure 2.9.** Trends of Localities' Poverty Incidence Among Families from 2006-2023 (National Statistical Coordination Board, 2013; PSA, 2018, 2021, 2023; Siosion, 2022)

Overall, increasing HDI trends can be observed from 2006-2019 across different localities (Figure 2.10). The NCR and nearby provinces had higher HDI results compared to those farther from the metro. However, a significant increase in the HDIs of these provinces far from the NCR can be observed from 2012 to 2019. This can be attributed to a shift in priority, such as Ilocos Norte’s administration focus on health, education, and employment (Adriano, 2024).



**Figure 2.10.** Human Development Index (HDI) Trends of Localities from 2006-2019 (PSA, 2020, 2023)

Given that education is one of the indicators, it is expected that there can be an HDI increase considering that the majority of the population was basically literate (able to read, write with understanding, and compute) in the 2024 PSA result of Functional Literacy, Education, and Mass Media Survey (FLEMMS) as presented in the figure below. However, considering that there are still illiterate (cannot read and write) and low literate (can only read and write) populations across different localities, there should be efforts to improve education access such as additional public schools, libraries, and teachers along with offering more scholarships and incentives (e.g., free uniforms, school supplies, tablets, and internet connectivity in schools).

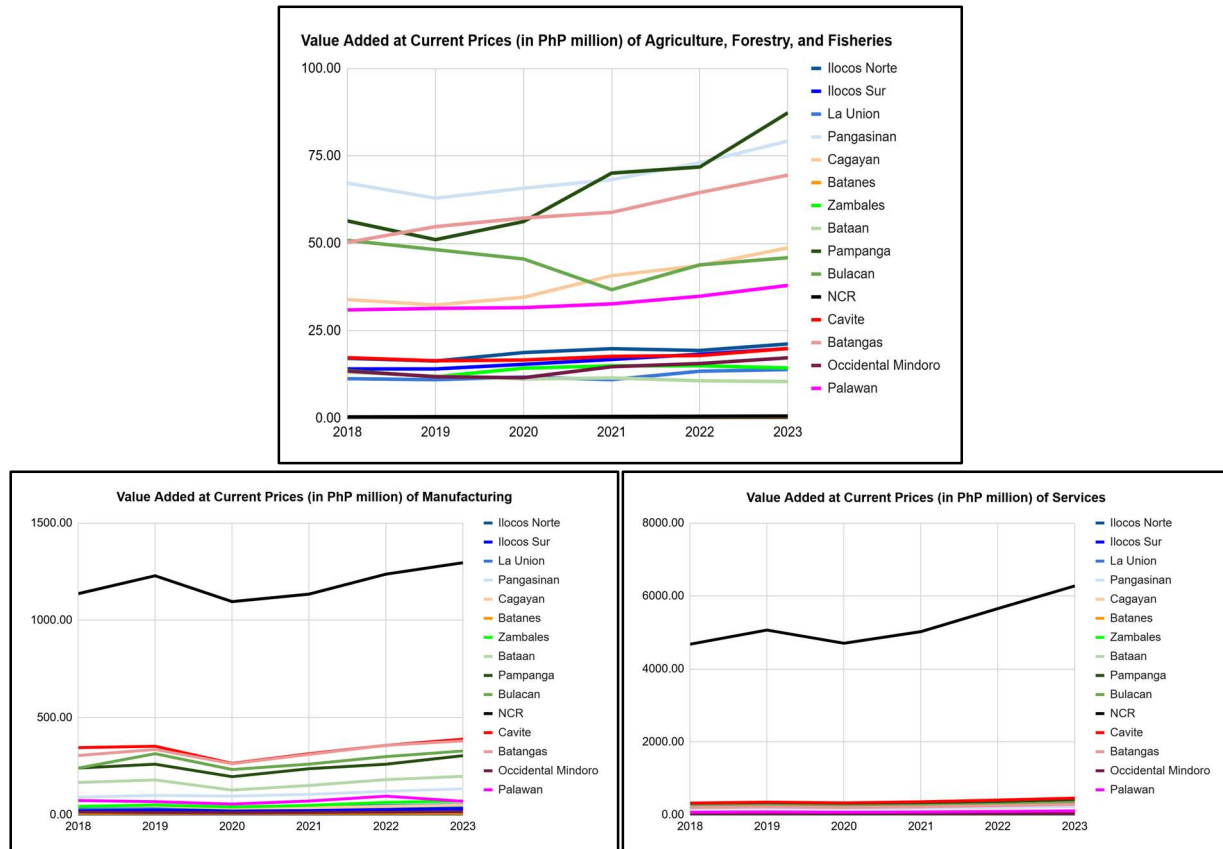


**Figure 2.11.** Localities' Levels of Literacy (PSA, 2024)

In terms of employment and livelihood components, rural areas contribute the highest economic outputs for agriculture, forestry, and fisheries. However, according to the National Economic and Development Authority or NEDA (2021), it is evident that primary production had the least economic contribution as compared to manufacturing

and services which are centered in cities and urban areas. Hence, a contributing factor as to why rural areas have higher poverty incidence compared to NCR and its nearby provinces.

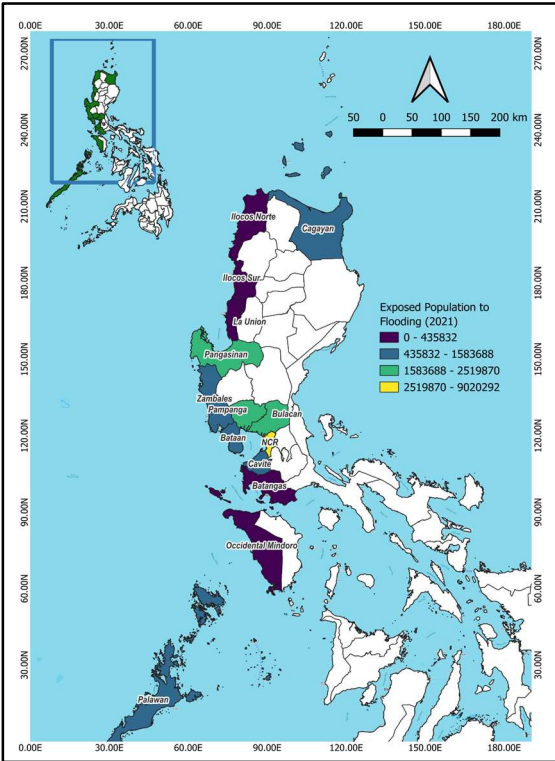
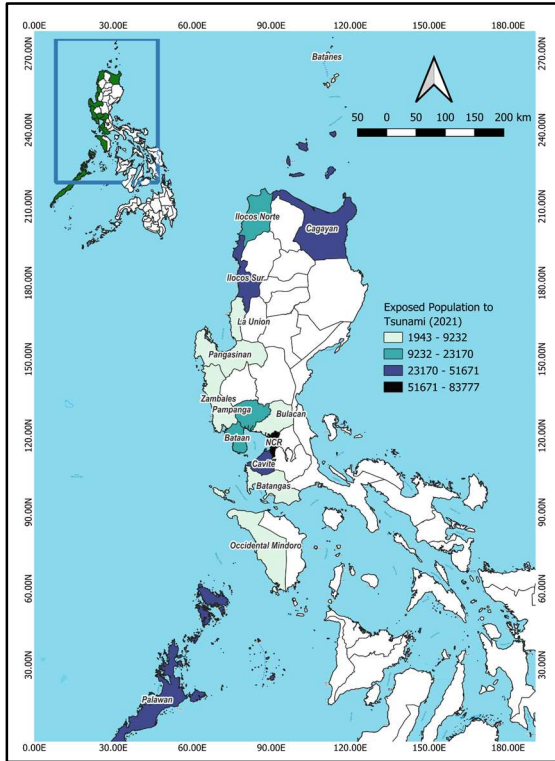
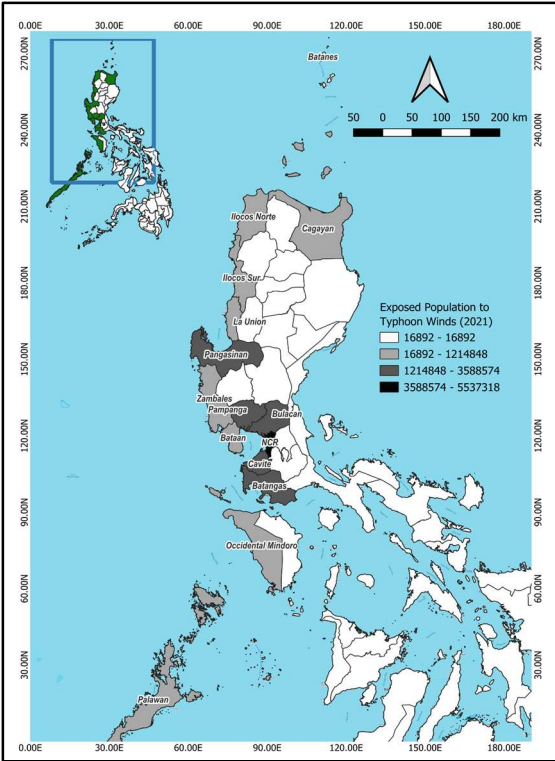
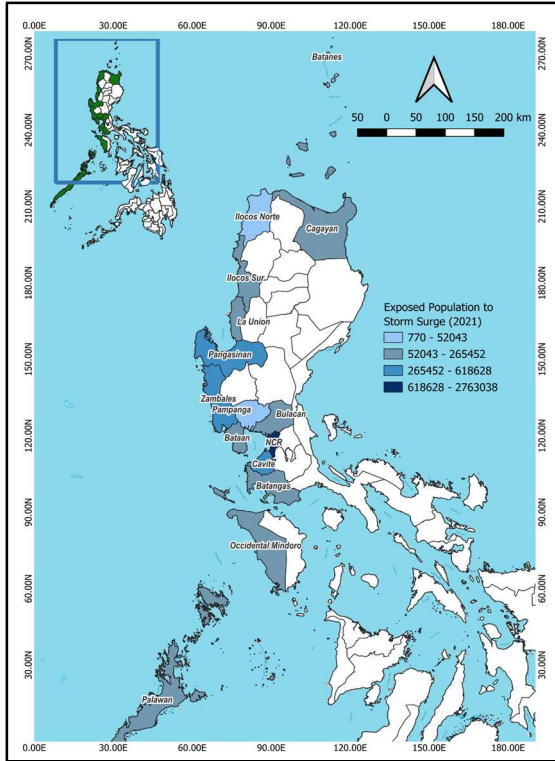
Overall, increase in value added at current prices from 2018 to 2023 is evident for all economic sectors. However, all experienced sudden decrease during the period of COVID-19 pandemic. Urban areas were recovering their manufacturing and services while some rural areas also ventured on increasing economic efforts centered on these aspects during the post-pandemic. If this continues, increase land conversion for commercial and industries may occur. Hence fewer agricultural lands in the future which may threaten supply and demand of primary production for the increasing population.

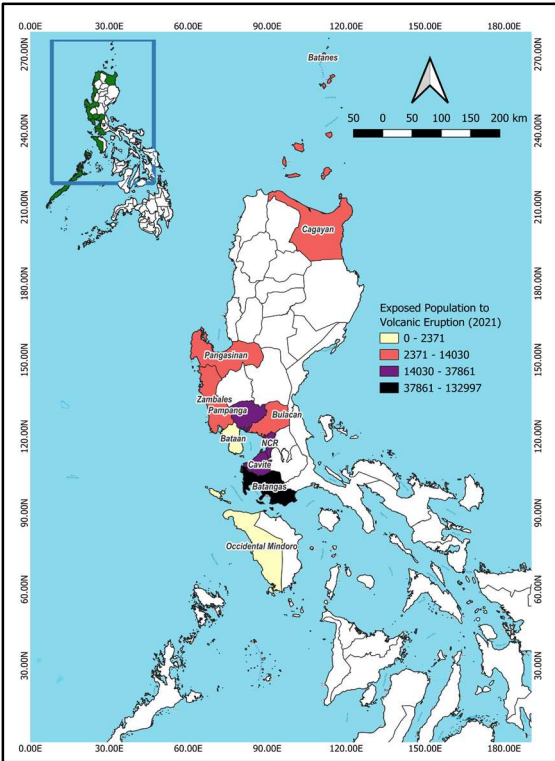
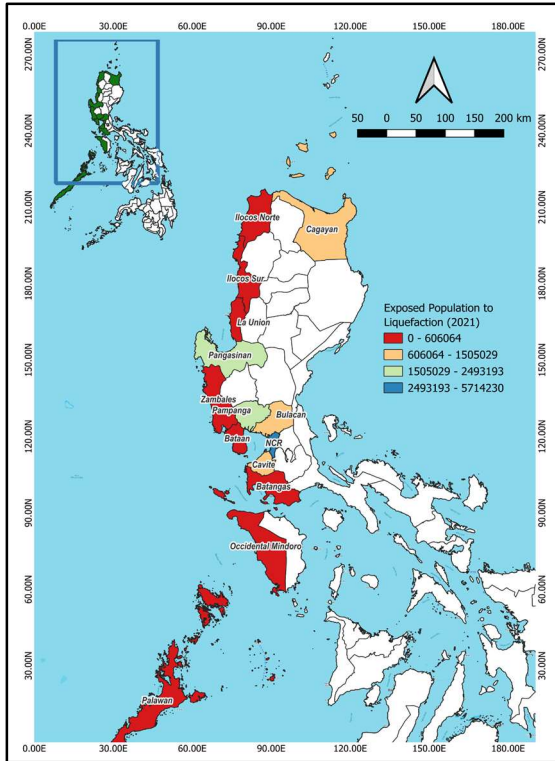
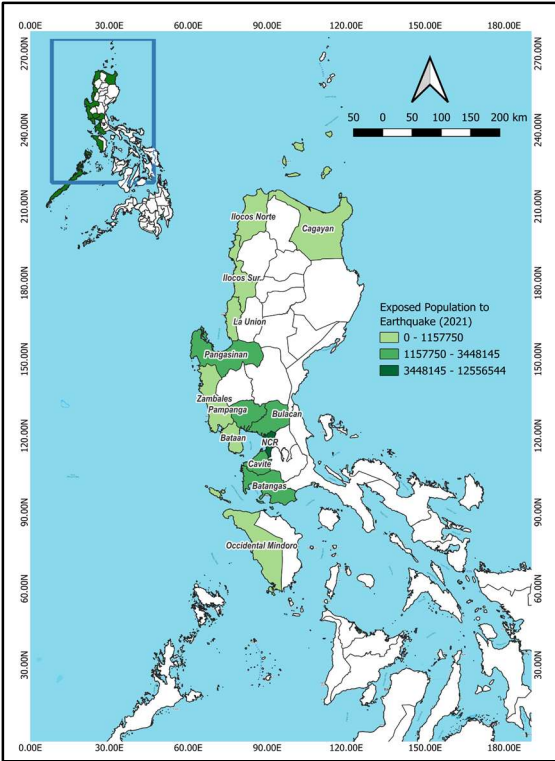
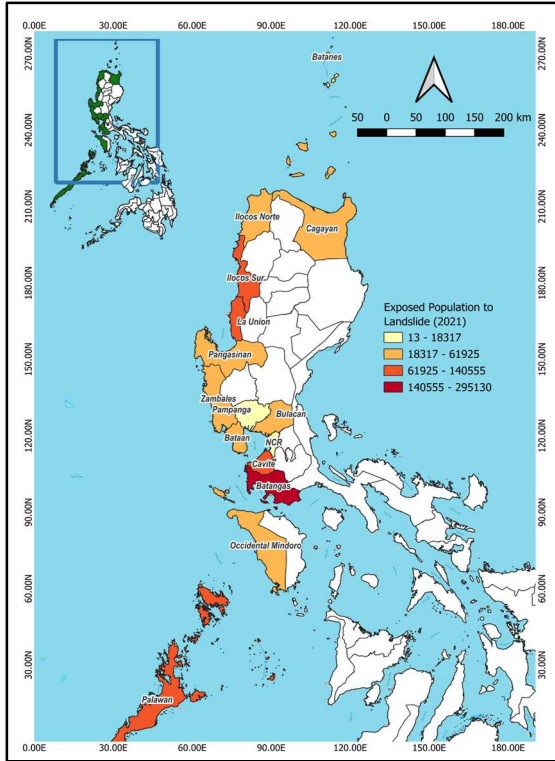


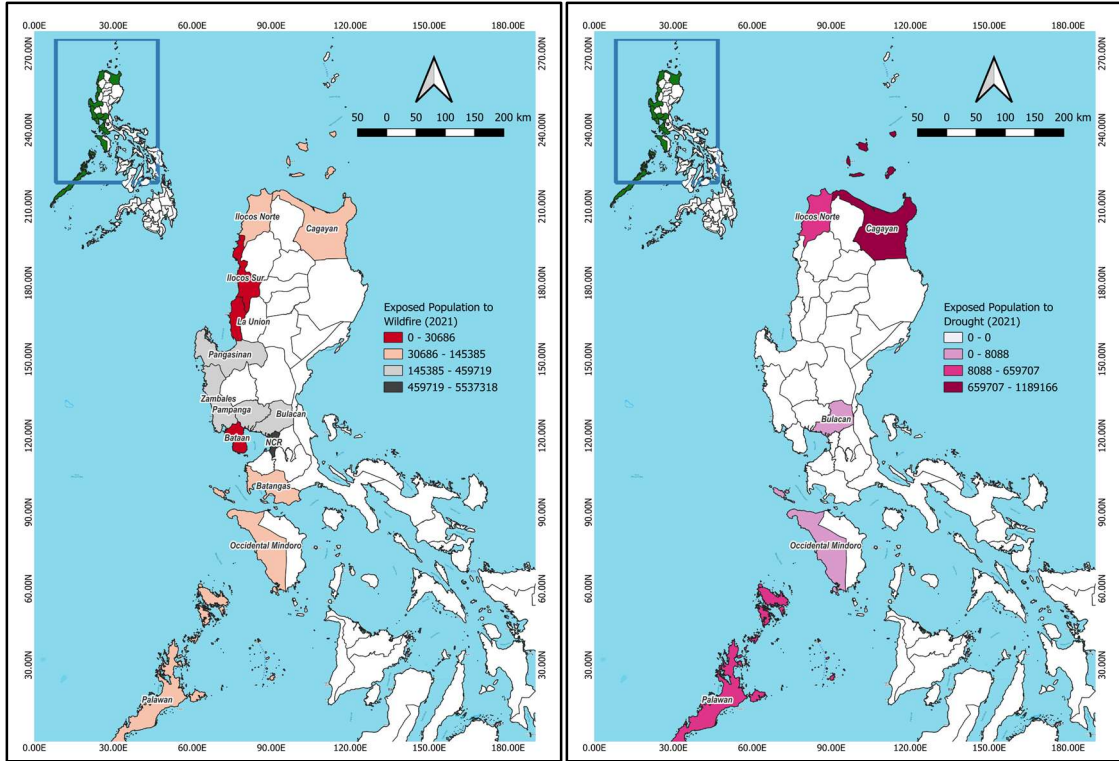
**Figure 2.12.** Economic Sector Trends of Value Added at Current Prices from 2018-2023 (PSA, 2025)

### 2.3.2 Risk Assessment from Climate- and Environment-Related Threats

The Philippines is an archipelago situated in the Pacific Ring of Fire. Thus, it is exposed and vulnerable to many hazards and disasters, especially hydrometeorological and geological in nature (Morante-Carballo, 2024). This is shown in the maps below, where all localities were exposed to many types of hazards. The NCR had the highest exposed population, followed by its nearby provinces. On the other hand, Batanes had the lowest, considering that it also had the least population among the provinces in the Philippines.

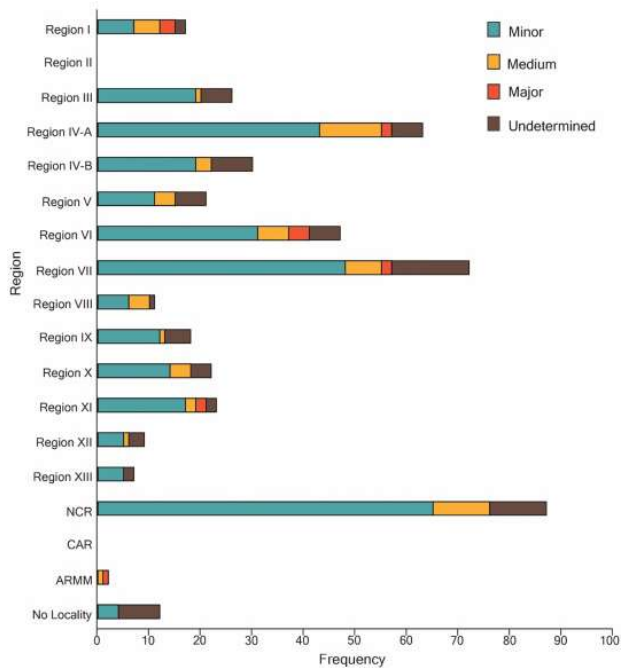






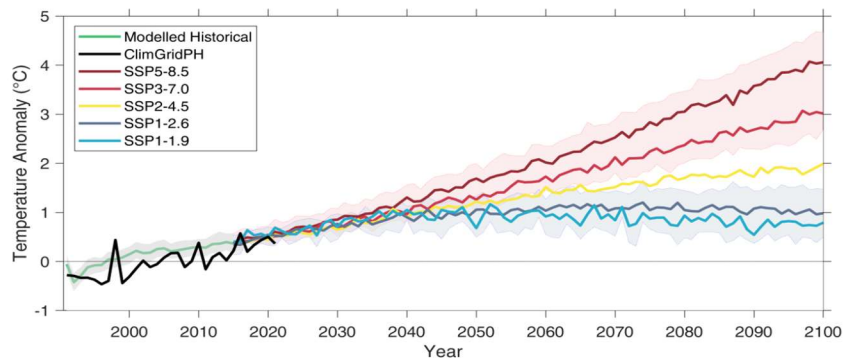
**Figure 2.13.** Exposed Population to Different Hazards of Localities in 2021 (Pacific Disaster Center, 2021)

Aside from natural hazards, human-induced maritime disasters such as oil spill is also evident. Localities experiencing shipping traffic and those with seaports are more prone to oil spill incidents. Hence, as seen in the figure below, NCR had the highest overall frequency of recorded oil spill.



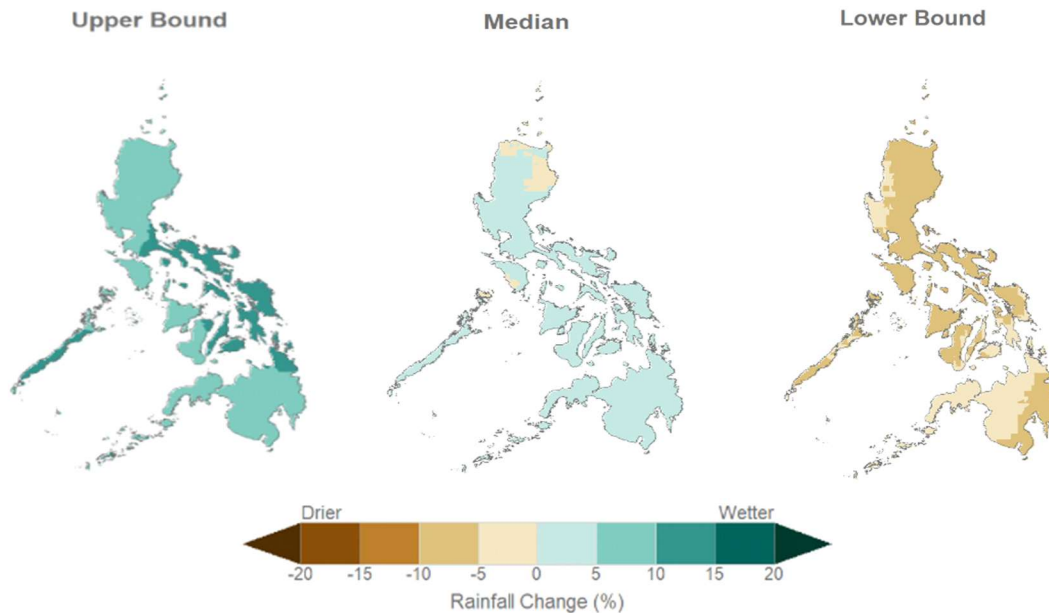
**Figure 2.14.** Frequency of Oil Spill Incidences Across Regions from 2000 to 2021 (Alea *et al.*, 2022)

Climate change is also a major concern that may intensify disasters. In fact, it is expected that there will be higher average temperatures in the coming years. In Figure 2.13, the thick black line represented the baseline data from 1990 to 2020. SSP are possible future scenarios of the Philippines. SSP1-1.9 and SSP2-2.6 showed that if the country continues with its sustainability pathways, temperature increases from 0.5 °C to 1.5 °C will still be experienced at the end of the 21st century. On the other hand, if SSP3-7.0 and SSP5-8.5 happen due to continuous vast emission of greenhouse gases (GHG), temperature may increase from 2.6 °C to 4.4 °C (DOST-PAGASA, 2024). Such impacts of global warming can lead to more frequent and intense hazards and disasters.



**Figure 2.15.** Time Series Showing the Annual Mean Temperature Anomalies in the Philippines (DOST-PAGASA, 2024)

In terms of rainfall projections, there are numerous scenarios for the Philippines. Rainfall in upper bound indicates that annual rainfall may increase to around 15% during the mid-21st century (2021-2050). Most areas in Luzon may have wetter conditions. On the other hand, for the median (50th percentile), this shows that rainfall in the country may become wetter by about 5% in comparison to 1981 to 2010. Lastly, for the lower bound (25th percentile), a projected decrease instead of about 10%-15% may be experienced across various localities. Excluding Zambales to Ilocos Sur, along with central part of Palawan, majority of Luzon cities and provinces will experience great reduction in rainfall (DOST-PAGASA, 2024). All these scenarios still pointed out a worse future due to more intense and heavy rainfall or a warmer country. Hence, disaster mitigation and preparedness efforts should be done to avoid or lessen the worse future scenarios.



**Figure 2.16.** Projected Changes in Annual Rainfall from 2021 to 2050 (DOST-PAGASA, 2024)

According to Maskrey & Lavell (2023), uncontrolled and excessive urbanization, such as the NCR and its neighboring provinces, contribute to the aforementioned climate-related threats. As more people opt to live in these areas, land conversion to cater to social, economic, and infrastructure needs is being prioritized; thus, leading to environmental depletion. Furthermore, improper waste management and pollution add to the degradation of the physical environment. This can also lead to higher exposed capital as majority of economic activities are centered in the cities and urban areas (Table 2.1).

**Table 2.1.** Exposed Capital (in USD) Against Hazards of Localities in 2021 (Pacific Disaster Center, 2021).

Exposed Capital in million USD (2021)										
Localities	Storm Surge	Typhoon Winds	Tsunami	Flooding	Landslide	Earthquake	Liquefaction	Volcanic Eruption	Wildfire	Drought
Ilocos Norte	170.2	3,100	51.9	1,600	108.2	3,000	2,400	NA	353.3	2,900
Ilocos Sur	1,300	3,600	59.3	2,300	217.3	3,500	3,200	NA	92.9	NA
La Union	1,200	4,400	2.4	2,700	332	3,800	3,000	NA	184.2	NA
Pangasinan	1900	14,900	7.9	12,600	166.8	14,700	12,500	26.3	1700	NA
Cagayan	617.7	8,200	163.1	6,400	156	8,000	7,200	49.4	499.1	8,200
Batanes	NA	55.5	1.6	NA	27	NA	NA	19.7	NA	NA
Zambales	782.3	1,500	4.3	912.6	73.4	1,400	1,200	15.6	711.2	NA
Bataan	870.6	1,900	8.9	1,700	72.6	1,800	1,200	6	20	NA
Pampanga	16	5,500	5.8	5,500	25.4	5,500	4,900	74.8	682.8	NA
Bulacan	2,000	13,100	5.2	10,500	27.2	13,100	7,400	39.2	2,900	0.97
NCR	33,700	5.54	434.5	119,600	NA	156,100	74,200	472	NA	NA
Cavite	1,700	3.59	32.2	6,300	101.1	10,300	4,700	57.8	6,800	NA
Batangas	744.7	6,900	6.6	0.3	0.3	6,800	1,200	290.5	416.5	NA
Occidental Mindoro	343.8	1,200	7.6	1,100	129.2	1,100	728.5	0.64	444.9	3.5
Palawan	321	1,100	10.2	1,100	310.1	NA	679	NA	154	1,500
<b>Legend:</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>NA/No Data</b>						

### 2.3.3. Mitigating Socioeconomic Vulnerability from Climate-Mediated Environmental Change- Current Actions and Gaps

There were various social, economic, and environmental interconnected challenges discussed above. It showed how climate-related threats can bring huge negative social and economic impacts to various affected localities; thus, a need for mitigation measures.

The NCR and nearby provinces were the center of economic development. The majority of the industries and services were located in these areas. Increasing income and taxes paved the way for investments in information, communication, and technology (D'Acci, 2021) for better predictions on and communication of hazards and disasters. However, insufficient digital literacy (Andaya *et al.*, 2025) hinders the effective delivery of information. Moreover, uncontrolled urbanization led to further environmental degradation. Thus, more frequent and intense disasters result in greater losses since there is little to no vegetation as natural protection against calamities (Maskrey & Lavell, 2023).

Neighboring provinces of the NCR prioritized urban green spaces (Province of Cavite, 2021). However, increasing demand for economic and residential needs due to urbanization led to land conversions. Aside from this, improper waste management may result in pollution and degradation of water resources across the country.

Eco-tourism played a vital role in increasing economic growth yet conserving the natural environment of island provinces and those situated far from the NCR. Ironically, illegal and unsustainable economic practices threaten the biodiversity and natural beauty of these places. Although ordinances such as a mining moratorium (Ticke & Lagare, 2025) are being implemented, these will not be effectively enforced without proper monitoring and evaluation.

### 2.3.4 Recommended Priority Actions

To strengthen current actions and resolve the challenges, the figure below was provided to better visualize recommended laws and PPAs that can be done within 20 years. This highlights the use of research to come up with baseline data and smart efforts for local communities. For instance, it can include nature-based solutions (NbS) and grassroot initiatives anchored to science, technology, and innovation (STI). Hence, modernization efforts, including infrastructure projects, were aligned with sustainability and local ecological knowledge. Moreover, regular capacitation was proposed across all sectors to ensure that people are knowledgeable and skilled on future development efforts so they can actively participate and have a sense of ownership of the proposed efforts to their communities. These would be feasible through partnerships, network-building, and strong executive-legislative support of the government.

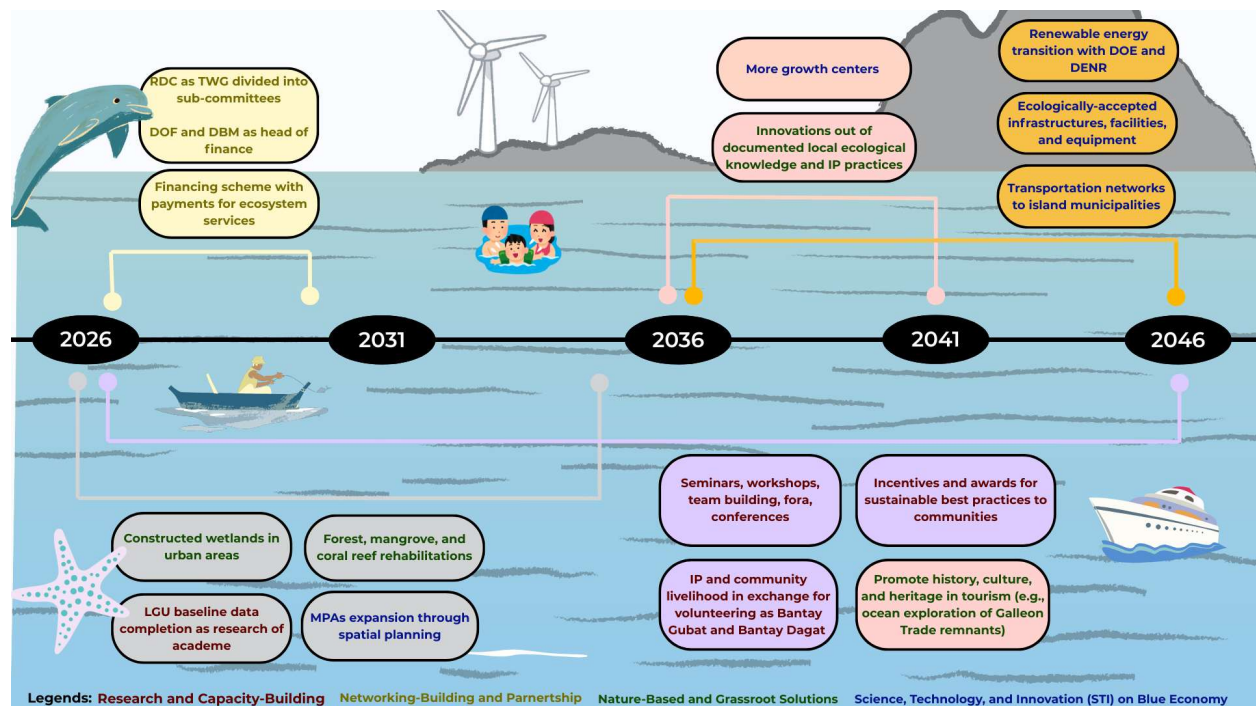


Figure 2.17. Roadmap of Recommended Priority Actions for 2026-2046

## 2.4 Methodology and Analysis

This chapter covered the coastal provinces along the Philippine Seas in the SCS-LME from Regions I to IV-B of the Philippines (Region I: Ilocos Norte, Ilocos Sur, La Union, Pangasinan; Region II: Cagayan, Batanes; Region III: Zambales, Bataan, Pampanga, Bulacan; NCR; Region IV-A: Cavite, Batangas; Region IV-B: Occidental Mindoro, Palawan). The sub-national unit used in the analyses is at the provincial level considering the ridge-to-reef approach, where economic activities in the upland communities affect the blue economy and vice versa.

There were given socio-economic indicators (Annex I) that should be filled out through provincial data available online. Hence, PSA, PAGASA, provincial websites, and various data searches were conducted from June to August 2025 to fill in the data requirements of the indicators. Tables (Annex II and III) and graphs were created in Google Sheets while digitized maps (Annex IV) were created through the QGIS application. These were used for better visualization of the data. Brief explanations of the figures were provided along with analysis, as supported by several studies.

### Glossary

- Biodiversity Hotspot - biogeographic region with high number of classified endemic species, yet significant habitat loss
- Blue Economy - sustainable utilization of ocean resources for livelihood/ job enhancement and economic growth, yet preserving healthy ocean ecosystems, divided into the following sectors:
  - (1) Aquaculture - farming aquatic organisms within open ocean or coastal waters
  - (2) Coastal and Marine Infrastructure - institutional and physical systems that facilitate sustainable utilization of resources for economic purposes while protecting the ecosystem
  - (3) Coastal and Marine Tourism - recreational activities done in marine and coastal zones
  - (4) Deep Sea Mining - industries requiring retrieval of non-living resources below the seafloor
  - (5) Fisheries - capturing wild aquatic biological resources such as plants, shellfish, and fish
  - (6) Marine Biotechnology - developing new and important products out of marine biodiversity
  - (7) Marine Transportation - moving/ transporting people, goods, and services across seas
  - (8) Renewable Marine Energy - clean energy generation from the ocean
- Congestion - state of being crowded, clogged, or full
- Ecosystem Services - benefits that human obtain from the ecosystem, categorized into:
  - (1) Cultural Services - non-material benefits from the environment (e.g., tourism and recreation, education, research, spiritual enhancement)
  - (2) Provisioning Services - tangible products from the environment (e.g., food, water, medicine, fuel)
  - (3) Regulating Services - acquired out of the ability of the environment to regulate ecosystem processes (e.g., water purification, pest and disease control, climate and flood control)
  - (4) Supporting Services - essential support for producing the other services (e.g., soil formation, photosynthesis, nutrient cycling)
- Far-Flung Areas - very distant, remote, or difficult to reach places
- Fertility Rates - a measure of the woman's average number of children over a lifetime
- Geographic Isolation - state where population is physically separated by barriers (e.g., mountains, rivers, oceans) that may limit flow of goods and services
- Global Warming - long-term, yet rapid increase in the average surface temperature of the Earth, mainly caused by unsustainable human activities (e.g., deforestation, burning fossil fuel)
- Grassroot Solutions - community-driven efforts to resolve development problems by using local knowledge, resources, and networks
- Greenhouse Gases - gases in the atmosphere of the Earth with the ability to trap heat coming from the sun
- Human Capital - economic value of people based on education, knowledge, skills, potential, experience, health, and other attributes that may strengthen productivity

- Human Development Index - a key metric to measure human well-being and quality of life using indicators/ elements which include per capita income, education, and life expectancy
- Indigenous Peoples - communities with deep historical and cultural ties with their ancestral lands, possessing unique history, tradition, language, knowledge, and social structures
- Local Ecological Knowledge - deeply-rooted and practical knowledge/ understanding of the local ecosystems, the species, and the environment that communities develop through experience and cultural practices, usually passed down to generations and offer important insights for resource management efforts, conservation, and climate shift adaptation
- Nature-Based Solutions - smart and cost-effective ways of using natural processes/ nature to resolve societal concerns
- Per Capita - Latin term for “per person/ head”
- Poor Families - in the Philippines, as per Republic Act No. 8425, this refers to households with per capita income/ expenses lower than declared per capita national family poverty threshold of Php 13,873 (USD 250) per month for a family composed of 5 members
- Population Density - use to measure the number of people situated per unit of land area to assess their distribution/ crowdedness of a place
- Poverty Incidence - proportion of individuals/ families with income below poverty threshold
- Ridge-to-Reef Approach - holistic way of managing land, water, and marine resources by recognizing their interconnectedness; hence, integrated issues and efforts that should be done from mountain uplands (ridges) to coastal areas/ coral reefs
- Rural Areas - outside cities known for low population density, yet large land area for agriculture and forestry
- Tropical Cyclone - a powerful rotating storm system that forms over warm ocean waters
- Urban Areas - settlement with high population density wherein in the Philippines, as per Republic Act No. 7279, this can refer to localities with population density of at least 500 persons per square kilometer of land

### Acronyms

- ASEAN - Association of Southeast Asian Nations
- CALABARZON - Cavite, Laguna, Batangas, Rizal
- CDRA - Climate and Disaster Risk Assessment
- CDP - Comprehensive Development Plan
- CLUP - Comprehensive Land Use Plan
- COVID - Coronavirus Disease
- CSOs - Civil Society Organizations
- DMB - Department of Budget and Management
- DEPDev - Department of Economy, Planning, and Development
- DOF - Department of Finance
- DOH - Department of Health
- DOST - Department of Science and Technology
- FLEMMS - Functional Literacy, Education, and Mass Media Survey
- GHG - Greenhouse Gases
- HDI - Human Development Index
- HDNFI - Human Development Network Foundation Incorporated
- ICM - Integrated Coastal Management
- IEC - Information, Communication, and Education
- LDIP - Local Development Investment Program
- NCR - National Capital Region
- NEDA - National Economic and Development Authority
- NLUA - National Land Use Act

- PAGASA - Philippine Atmospheric, Geophysical and Astronomical Services Administration
- PPAs - Programs, projects, and activities
- PSA - Philippine Statistics Authority
- QGIS - Quantum Geographic Information System
- RDC - Regional Development Council
- SCS-LME - South China Sea Large Marine Ecosystem
- SDGs - Sustainable Development Goals
- STI - Science, Technology, and Innovation
- TC - Tropical Cyclone
- UNDP - United Nations Development Programme

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The authors declare no conflicts of interest influencing the design, conduct, or interpretation of this work.

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1. **C.B.A.:** conceptualization, formal analysis, methodology, supervision, validation, writing – original draft, writing – review and editing
2. **M.J.J.A.:** data curation, formal analysis, investigation, methodology, project administration, validation, visualization, writing – original draft, writing – review and editing

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## Chapter 2 Annexes

### Annex 2.A. List of Indicators

**Table 2.A.1.** List of Demographic Indicators

<b>SC1 Demographics</b>	<b>Components</b>
SE1-1. Subnational Population	Number of Female Households
	Number of Male Households
	Total Households
	Total Population
	Growth Rate
SE1-2. Areas of Subnational First Level Administrative Region	Total Land Area (sq km)
SE1-3. Subnational Populations as % of National Population	% to Philippine Population
SE1-4. Subnational Region Areas as % of National Area	% to Philippines' Total Land Area (sq km)
SE1-5. Annual Population Changes	% Annual Change in the Population
SE1-6. Population Densities	Population Density (people/ sq km)
SE1-10 Urbanization Rate	
SE1-11 Built Up Surface	Total Floor Area of Construction (sq km)

**Table 2.A.2.** List of Human Well-Being Indicators

<b>SC2 Human Well-being</b>	<b>Components</b>
SE2.1 Poverty	Poverty Incidence Among Families (%)
SE2.2 Contemporary Human Development Index HDI	Level of Literacy (Illiterate, Low Literate, Basic Literate)
	HDI Value and Classification

**Table 2.A.3.** List of Blue Economy Indicators

<b>SC3 Blue Economy</b>	<b>Components</b>
SE3.1. Subnational Regional GDP by Economic Sector (Agriculture, Manufacturing, Services)	Agriculture, Forestry, and Fisheries Value Added at Current Price
	Manufacturing
	Manufacturing Value Added at Current Price
	Mining and Quarrying
	Electricity, Steam, Water, and Waste Management
	Construction
	Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles
	Services Value Added at Current Price
	Transportation and Storage
	Accommodation and Food Service Activities
Information and Communication	
Financial and Insurance	

<b>SC3 Blue Economy</b>	<b>Components</b>
	Activities
	Real Estate and Ownership of Dwellings
	Professional and Business Services
	Public Administration & Defense and Compulsory Social Activities
	Education
	Human Health and Social Work Activities
	Other Services

**Table 2.A.4.** List of Climate-Related Threats Indicators

<b>SE4 Climate-Related Threats</b>	<b>Components</b>
SE4-1. Number of Tropical Cyclones and Typhoons	
SE4-2. Number of Deaths Because of Tropical Cyclones and Typhoons	Storm Surge
	Typhoon Winds
	Tsunami
	Flooding
	Landslide
SE4-3 Possible Total Damage Due to Hazards and Disasters	Earthquake
	Liquefaction
	Volcanic Eruption
	Wildfire
	Drought
	Other risks (epidemics, conflicts, etc)

## Annex 2.B. Socioeconomics Threats Database

**Table 2.B.1.** Population of Localities from 1995 to 2020 (Philippine Statistics Authority, 2023).

Localities	Historical Data of Population					
	1995	2000	2007	2010	2015	2020
Ilocos Norte	482,651	514,241	547,284	568,017	593,081	609,588
Ilocos Sur	545,385	594,206	633,138	658,587	689,668	706,009
La Union	597,442	657,945	720,972	741,906	786,653	822,352
Pangasinan	2,178,412	2,434,086	2,645,395	2,779,862	2,956,726	3,163,190
Cagayan	895,050	993,580	1,072,571	1,124,773	1,199,320	1,268,603
Batanes	14,180	16,467	15,974	16,604	17,246	18,831
Zambales	569,266	627,802	720,355	755,621	823,888	909,932
Bataan	491,459	557,659	662,153	687,482	760,650	853,373
Pampanga	1,635,767	1,882,730	2,229,349	2,340,355	2,609,744	2,900,637
Bulacan	1,784,441	2,234,088	2,822,216	2,924,433	3,292,071	3,708,890
NCR	9,454,040	9,932,560	11,547,959	11,855,975	12,877,253	13,484,462
Cavite	1,610,324	2,063,161	2,856,765	3,090,691	3,678,301	4,344,829
Batangas	1,658,567	1,905,348	2,245,869	2,377,395	2,694,335	2,908,494
Occidental Mindoro	339,605	380,250	421,952	452,971	487,414	525,354
Palawan	640,486	755,412	892,660	994,340	1,104,585	1,246,673

**Table 2.B.2.** Projected Population of Localities from 2025 to 2050

Localities	Projected Populations					
	2025	2030	2035	2040	2045	2050
Ilocos Norte	612,952	616,334	619,735	623,154	626,593	630,050
Ilocos Sur	709,330	712,666	716,018	719,386	722,769	726,169
La Union	829,711	837,135	844,625	852,182	859,807	867,500
Pangasinan	3,206,416	3,250,233	3,294,649	3,339,671	3,385,309	3,431,570
Cagayan	1,282,998	1,297,556	1,312,279	1,327,169	1,342,228	1,357,458
Batanes	19,168	19,510	19,859	20,214	20,575	20,943
Zambales	928,338	947,116	966,274	985,819	1,005,759	1,026,103
Bataan	873,418	893,934	914,932	936,422	958,418	980,930
Pampanga	2,963,128	3,026,966	3,092,178	3,158,796	3,226,849	3,296,367
Bulacan	3,799,253	3,891,817	3,986,636	4,083,765	4,183,261	4,285,180
NCR	13,609,761	13,736,224	13,863,862	13,992,685	14,122,706	14,253,935
Cavite	4,493,987	4,648,265	4,807,840	4,972,893	5,143,611	5,320,191
Batangas	2,953,604	2,999,414	3,045,934	3,093,176	3,141,150	3,189,868
Occidental Mindoro	533,338	541,443	549,670	558,023	566,503	575,112
Palawan	1,277,514	1,309,117	1,341,503	1,374,689	1,408,696	1,443,545

**Table 2.B.3.** Growth Rate of Localities from 1995 to 2020

Localities	Historical Data of Growth Rate					Annual Growth Rate
	1995-2000	2000-2007	2007-2010	2010-2015	2015-2020	
Ilocos Norte	1.276	0.894	1.247	0.867	0.551	0.110
Ilocos Sur	1.729	0.911	1.322	0.927	0.469	0.094
La Union	1.948	1.315	0.959	1.178	0.892	0.178
Pangasinan	2.244	1.196	1.666	1.241	1.359	0.272
Cagayan	2.111	1.099	1.597	1.292	1.130	0.226
Batanes	3.036	-0.433	1.298	0.762	1.774	0.355
Zambales	1.977	1.984	1.606	1.745	2.007	0.401
Bataan	2.560	2.484	1.259	2.043	2.327	0.465
Pampanga	2.852	2.443	1.633	2.203	2.136	0.427
Bulacan	4.597	3.395	1.193	2.397	2.413	0.483
NCR	0.992	2.176	0.881	1.666	0.926	0.185
Cavite	5.081	4.759	2.658	3.542	3.387	0.677
Batangas	2.813	2.377	1.915	2.535	1.541	0.308
Occidental Mindoro	2.287	1.498	2.393	1.477	1.510	0.302
Palawan	3.356	2.414	3.661	2.125	2.450	0.490

**Table 2.B.4.** Population Density of Localities from 1995 to 2020

Localities	Total Land Area (sq km)	Population Density (people/ sq km)					
		1995	2000	2007	2010	2015	2020
Ilocos Norte	3,418.75	142	151	161	167	174	179
Ilocos Sur	2,596.00	211	229	244	254	266	272
La Union	1,499.28	399	439	481	495	525	549
Pangasinan	5,450.59	400	447	486	511	543	581
Cagayan	9,398.07	96	106	115	120	128	135
Batanes	203.22	70	82	79	82	85	93
Zambales	3,815.35	150	165	189	199	216	239
Bataan	1,372.98	358	407	483	501	555	622
Pampanga	2,064.59	793	912	1,080	1,134	1,265	1,405
Bulacan	2,783.69	642	803	1,014	1,051	1,183	1,333
NCR	619.54	15,260	16,033	18,640	19,137	20,786	21,766
Cavite	1,526.28	1,056	1,352	1,872	2,025	2,410	2,847
Batangas	3,115.05	533	612	721	764	865	934
Occidental Mindoro	5,851.09	59	65	73	78	84	90
Palawan	17,030.75	38	45	53	59	65	74

**Table 2.B.5.** Projected Population Density of Localities from 2025 to 2050

Localities	Projected Population Density (people/sq km)					
	2025	2030	2035	2040	2045	2050
Ilocos Norte	180	181	182	183	184	185
Ilocos Sur	274	275	276	278	279	280
La Union	554	559	564	569	574	579
Pangasinan	589	597	605	613	622	630
Cagayan	137	139	140	142	143	145
Batanes	95	97	98	100	102	104
Zambales	244	249	254	259	264	269
Bataan	637	652	667	683	699	715
Pampanga	1436	1467	1498	1530	1563	1597
Bulacan	1365	1399	1433	1468	1503	1540
NCR	21968	22172	22378	22586	22796	23008
Cavite	2945	3046	3151	3259	3371	3486
Batangas	949	963	978	993	1009	1025
Occidental Mindoro	92	93	94	96	97	99
Palawan	76	77	79	81	83	85

**Table 2.B.6.** Localities' Poverty Incidence Among Families from 2006 to 2023 (Sources: National Statistical Coordination Board, 2013; Philippine Statistics Authority, 2018, 2021, 2023; Siosion, 2022).

Localities	Poverty Incidence Among Families (%)						
	2006	2009	2012	2015	2018	2021	2023
Ilocos Norte	13.7	11.1	8.4	5.2	3.1	1.7	0.3
Ilocos Sur	16.4	13.4	13.7	10.8	5.5	11.5	5.2
La Union	20.8	22.4	15.3	13.5	2.9	6.6	6.3
Pangasinan	21.8	17.2	14.9	16.9	9.3	13.9	11.4
Cagayan	25.1	22.5	15.2	14.0	12.5	7.3	5.7
Batanes	14.3	16.7	18.2	10.0	6.5	2.6	3.3
Zambales	18.6	11.9	12.1	12.3	10.9	17.7	11.8
Bataan	6.2	5.9	4.5	0.8	5.8	9.0	6.6
Pampanga	2.0	4.9	5.4	2.7	2.1	2.9	1.0
Bulacan	4.9	4.6	5.4	3.1	3.5	8.3	6.0
NCR	2.9	2.4	2.6	2.8	1.4	2.2	1.1
Cavite	1.2	2.2	2.6	6.1	3.7	7.1	4.3
Batangas	10.9	12.6	14.7	17.4	8.6	4.3	4.9
Occidental Mindoro	33.5	25.0	29.8	30.5	16.1	23.0	20.6
Palawan	28.2	25.3	20.5	12.6	8.2	9.4	15.8

**Table 2.B.7.** HDI of Localities from 2006 to 2019 (Philippine Statistics Authority, 2020; 2023)

Localities	HDI				
	2006	2009	2012	2015	2019
Ilocos Norte	0.638	0.653	0.745	0.735	0.820
Ilocos Sur	0.562	0.603	0.682	0.683	0.700
La Union	0.641	0.669	0.695	0.722	0.760
Pangasinan	0.535	0.601	0.596	0.643	0.650
Cagayan	0.584	0.623	0.627	0.671	0.680
Batanes	0.667	0.698	0.535	0.758	0.790
Zambales	0.583	0.596	0.534	0.652	0.690
Bataan	0.673	0.696	0.705	0.793	0.750
Pampanga	0.716	0.667	0.726	0.765	0.760
Bulacan	0.714	0.728	0.713	0.757	0.760
NCR	0.801	0.818	0.817	0.849	0.850
Cavite	0.74	0.726	0.733	0.748	0.780
Batangas	0.642	0.661	0.675	0.731	0.740
Occidental Mindoro	0.492	0.568	0.554	0.607	0.610
Palawan	0.505	0.509	0.603	0.699	0.660

**Table 2.B.8.** HDI Indicators of Localities in 2015 (Human Development Network Foundation Inc., 2021).

Localities	HDI Indicators (2015)			
	Life Expectancy at Birth (Years)	Mean Years of Schooling	Expected Years of Schooling	Per Capita Income (US 2011 PPP \$)
Ilocos Norte	70.0	9.9	12.8	2,956
Ilocos Sur	71.2	9.4	13.6	2,729
La Union	68.5	9.9	13.0	2,663
Pangasinan	69.1	9.8	12.2	2,307
Cagayan	70.6	8.9	12.9	2,570
Batanes	71.2	11.2	7.0	5,226
Zambales	70.2	9.6	13.1	3,007
Bataan	69.9	10.0	12.3	4,276
Pampanga	70.8	9.9	12.6	3,520
Bulacan	70.6	9.7	12.6	3,397
NCR	73.3	11.1	13.1	4,590
Cavite	70.7	10.4	12.3	3,702
Batangas	70.2	9.7	12.6	3,167
Occidental Mindoro	68.4	8.4	12.5	2,151

**Table 2.B.9.** Value Added at Current Prices (2023) of Economic Sectors in Different Localities (Philippine Statistics Authority, 2025).

Localities	Agriculture, Forestry, and Fisheries Value Added at Current Price (2023)	Manufacturing Value Added at Current Price (2023)				Services Value Added at Current Price (2023)			
		Manufacturing	Electricity, Steam, Water, and Waste Management	Construction	Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles	Transportation and Storage	Accomm. and Food Service Activities	Info and Comm	Financial and Insurance Activities
Ilocos Norte	21,230,803.15	6,705,006.06	13,815,692.20	17,594,635.69	19,494,889.67	5,092,558.54	3,888,511.57	3,937,442.40	5,059,036.50
Ilocos Sur	19,908,982.14	2,589,322.65	6,670,539.31	21,437,368.67	22,581,851.19	2,749,742.00	4,090,437.27	3,523,167.48	6,122,531.06
La Union	13,923,341.21	10,497,288.41	12,695,632.53	28,873,379.98	27,708,155.48	4,348,522.55	3,558,868.29	5,488,280.13	4,978,502.23
Pangasinan	79,233,747.09	52,994,305.59	29,868,480.97	50,059,143.56	72,778,393.88	11,761,859.36	13,499,490.42	15,234,596.85	18,528,561.84
Cagayan	48,713,791.21	13,734,292.34	4,456,319.35	31,418,103.56	24,203,139.63	10,163,254.01	4,058,420.78	6,879,939.20	5,757,956.67
Batanes	388,306.85	362,878.45	187,707.92	1,363,816.27	433,947.60	918,354.90	530,055.12	231,273.83	163,628.79
Zambales	14,403,770.41	18,505,379.74	11,139,062.39	35,180,023.88	24,043,529.74	12,277,856.03	4,713,759.57	8,703,805.51	7,079,141.67
Bataan	10,482,070.37	139,343,421.81	22,338,083.00	35,709,660.37	27,497,285.75	10,393,384.46	6,199,633.81	8,898,228.28	8,520,159.81
Pampanga	87,300,435.82	208,366,809.20	21,328,513.57	69,747,068.35	82,859,202.92	35,269,619.41	25,292,173.86	32,707,480.17	34,531,757.55
Bulacan	45,872,149.37	187,864,140.40	20,974,550.68	130,434,408.01	85,536,073.02	28,630,983.44	16,757,016.83	35,557,278.92	24,002,277.22
NCR	622,442.86	859,803,102.69	113,054,723.58	322,595,779.31	1,713,958,489.10	187,277,601.61	97,612,255.57	171,873,049.58	1,532,893,897.77
Cavite	19,938,327.86	341,712,048.97	12,031,534.76	34,855,654.52	136,021,585.01	38,668,678.61	19,713,309.56	43,771,790.94	52,594,585.24
Batangas	69,499,766.61	270,832,950.71	76,987,567.70	30,934,510.15	63,512,695.17	21,725,547.65	11,476,194.74	26,063,854.86	37,325,921.65
Occidental Mindoro	17,279,740.28	3,062,139.79	4,985,167.97	7,236,669.00	8,556,689.45	2,916,868.78	535,876.12	1,757,574.61	4,321,428.18
Palawan	37,960,025.22	23,847,718.32	8,782,228.08	10,663,562.19	23,960,120.56	18,774,591.29	9,636,136.53	8,636,996.02	9,233,045.87

**Table 2.B.9.** (Continuation...)

Localities	Agriculture, Forestry, and Fisheries Value Added at Current Price (2023)	Manufacturing Value Added at Current Price (2023)				Services Value Added at Current Price (2023)				
		Manufacturing	Electricity, Steam, Water, and Waste Management	Construction	Real Estate and Ownership of Dwellings	Professional and Business Services	Public Administration and Defense, Compulsory Social Activities	Education	Human Health and Social Work Activities	Other Services
Ilocos Norte	21,230,803.15	6,705,006.06	13,815,692.20	17,594,635.69	6,268,275.43	1,600,532.54	3,652,679.19	5,966,938.22	2,343,230.21	1,791,597.10
Ilocos Sur	19,908,982.14	2,589,322.65	6,670,539.31	21,437,368.67	7,170,640.80	1,331,905.04	4,820,104.78	6,745,135.13	4,037,544.82	1,867,755.23
La Union	13,923,341.21	10,497,288.41	12,695,632.53	28,873,379.98	8,154,768.96	2,271,367.10	7,567,375.30	7,115,248.34	3,252,021.55	3,828,044.74
Pangasinan	79,233,747.09	52,994,305.59	29,868,480.97	50,059,143.56	25,410,388.56	7,287,291.03	11,212,538.83	26,486,419.20	10,416,624.19	9,166,889.95
Cagayan	48,713,791.21	13,734,292.34	4,456,319.35	31,418,103.56	8,373,054.61	1,638,153.31	6,035,458.75	11,223,377.67	4,766,774.47	1,114,762.83
Batanes	388,306.85	362,878.45	187,707.92	1,363,816.27	166,445.81	139,574.90	504,240.02	454,308.62	217,044.43	79,417.11
Zambales	14,403,770.41	18,505,379.74	11,139,062.39	35,180,023.88	10,008,137.47	3,449,930.60	5,267,065.23	7,497,519.80	2,038,756.23	7,343,086.38

Localities	Agriculture, Forestry, and Fisheries Value Added at Current Price (2023)	Manufacturing Value Added at Current Price (2023)			Services Value Added at Current Price (2023)					
		Manufacturing	Electricity, Steam, Water, and Waste Management	Construction	Real Estate and Ownership of Dwellings	Professional and Business Services	Public Administration and Defense, Compulsory Social Activities	Education	Human Health and Social Work Activities	Other Services
Bataan	10,482,070.37	139,343,421.81	22,338,083.00	35,709,660.37	10,943,214.77	11,716,342.63	4,218,125.23	7,066,099.87	2,881,916.52	8,465,314.64
Pampanga	87,300,435.82	208,366,809.20	21,328,513.57	69,747,068.35	51,610,669.55	75,208,071.91	16,452,313.19	22,235,871.68	13,481,115.48	21,970,104.09
Bulacan	45,872,149.37	187,864,140.40	20,974,550.68	130,434,408.01	37,406,319.91	33,534,540.89	9,201,839.34	26,209,327.78	10,074,032.40	20,003,525.91
NCR	622,442.86	859,803,102.69	113,054,723.58	322,595,779.31	471,552,062.16	978,264,419.87	652,711,226.25	159,239,357.20	146,838,075.65	163,596,339.82
Cavite	19,938,327.86	341,712,048.97	12,031,534.76	34,855,654.52	57,270,963.89	25,234,834.93	18,850,742.84	36,453,103.98	12,012,736.11	17,770,292.93
Batangas	69,499,766.61	270,832,950.71	76,987,567.70	30,934,510.15	45,338,693.03	12,325,537.50	19,653,942.14	26,756,167.00	8,484,973.61	11,386,609.86
Occidental Mindoro	17,279,740.28	3,062,139.79	4,985,167.97	7,236,669.00	1,473,555.68	906,637.83	2,549,677.02	4,123,143.74	803,297.13	2,242,168.92
Palawan	37,960,025.22	23,847,718.32	8,782,228.08	10,663,562.19	6,838,719.98	2,338,897.77	7,292,329.34	9,628,384.96	3,272,547.36	9,172,044.35

**Table 2.B.10.** Value Added at Current Prices of Agriculture, Forestry, and Fisheries in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025)

Localities	Agriculture, Forestry, and Fisheries Value Added at Current Price (2023)					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	17,107,229.24	16,360,223.43	18,772,234.93	19,887,559.33	19,372,172.25	21,230,803.15
Ilocos Sur	14,118,038.90	14,117,404.29	15,423,318.90	16,797,339.75	18,314,873.71	19,908,982.14
La Union	11,301,327.27	11,026,759.74	11,796,742.01	11,031,735.10	13,453,174.60	13,923,341.21
Pangasinan	67,200,148.80	62,910,244.03	65,760,438.42	68,181,053.57	73,032,458.73	79,233,747.09
Cagayan	33,914,777.20	32,384,298.86	34,583,516.41	40,753,256.75	43,669,858.74	48,713,791.21
Batanes	232,490.48	255,762.70	237,735.30	255,139.87	282,496.88	388,306.85
Zambales	13,594,894.73	11,872,112.95	14,326,538.17	14,996,747.26	15,026,079.42	14,403,770.41
Bataan	13,157,228.09	12,107,583.87	11,230,130.12	11,516,476.77	10,700,379.93	10,482,070.37
Pampanga	56,404,652.18	51,029,311.32	56,218,697.28	70,073,070.21	71,807,998.57	87,300,435.82
Bulacan	50,857,107.64	48,194,297.66	45,530,244.57	36,756,659.70	43,843,776.43	45,872,149.37
NCR	397,869.79	442,597.10	450,941.54	503,378.47	560,698.27	622,442.86
Cavite	17,307,658.08	16,420,834.50	16,657,912.24	17,697,988.80	17,925,715.31	19,938,327.86
Batangas	50,262,883.88	54,782,090.46	57,224,160.88	58,842,851.81	64,522,404.68	69,499,766.61
Occidental Mindoro	13,514,546.12	11,864,155.86	11,600,903.83	14,719,199.66	15,644,945.65	17,279,740.28
Palawan	30,963,790.46	31,401,751.07	31,618,704.24	32,691,904.36	34,878,803.01	37,960,025.22

**Table 2.B.11.** Value Added at Current Prices of Manufacturing in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025)

Localities	Manufacturing at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	4,905,840.39	5,665,943.19	5,426,458.07	5,849,697.56	6,461,760.47	6,705,006.06
Ilocos Sur	1,916,225.91	2,171,712.95	2,047,827.66	2,168,092.78	2,384,008.50	2,589,322.65
La Union	8,077,289.32	9,175,936.67	8,672,818.97	9,536,874.40	10,308,489.77	10,497,288.41
Pangasinan	38,156,770.71	42,664,638.89	40,814,767.88	45,213,454.29	49,285,363.70	52,994,305.59
Cagayan	11,912,932.41	12,594,404.18	10,762,603.28	11,541,152.56	12,447,176.71	13,734,292.34
Batanes	297,232.98	315,909.62	274,874.10	295,359.96	317,055.84	362,878.45
Zambales	18,098,939.40	19,475,969.71	13,142,626.96	15,267,037.83	17,421,269.49	18,505,379.74
Bataan	119,630,166.47	127,341,553.70	89,728,153.40	109,132,521.82	130,000,078.91	139,343,421.81
Pampanga	180,020,128.65	194,218,190.02	143,252,417.37	172,481,046.69	195,710,075.68	208,366,809.20
Bulacan	177,718,684.63	189,217,677.30	137,156,293.90	163,725,998.03	178,257,192.64	187,864,140.40
NCR	789,421,475.80	822,544,373.27	759,278,157.77	770,700,168.34	835,168,015.28	859,803,102.69
Cavite	308,127,756.35	311,778,338.25	235,988,928.06	277,843,154.22	316,475,229.10	341,712,048.97
Batangas	233,435,892.91	258,636,718.07	190,677,061.07	229,413,205.78	263,922,067.41	270,832,950.71
Occidental Mindoro	3,295,136.43	3,019,780.99	2,837,865.68	2,930,793.10	3,143,810.99	3,062,139.79
Palawan	21,565,186.42	21,445,968.14	19,987,716.73	21,480,411.61	23,975,368.40	23,847,718.32

**Table 2.B.12.** Value Added at Current Prices of Mining and Quarrying in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Mining and Quarrying at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	148,658.76	174,642.72	203,359.35	214,177.25	265,870.54	280,128.59
Ilocos Sur	58,928.09	77,361.05	72,387.97	90,328.01	100,534.61	110,301.55
La Union	350,446.84	413,636.65	422,803.92	483,434.11	520,404.85	528,360.24
Pangasinan	677,335.67	781,033.85	816,238.45	866,584.31	1,011,915.56	1,080,968.07
Cagayan	704,232.05	774,450.29	822,546.23	984,464.74	1,036,143.03	1,072,590.13
Batanes	1,819.77	2,098.10	2,470.89	2,912.13	3,141.97	3,334.83
Zambales	968,543.99	504,572.97	596,086.70	2,367,069.16	5,225,750.39	6,217,029.07
Bataan	17,929.75	17,745.77	11,516.81	13,977.02	16,965.44	22,177.93
Pampanga	2,885,185.63	2,634,725.09	1,867,008.58	2,366,311.27	3,386,703.28	4,447,310.03
Bulacan	2,745,570.71	2,750,644.18	1,975,736.03	2,193,759.07	3,201,337.79	4,194,324.36
NCR	473,494.13	435,845.60	375,384.05	396,643.82	430,591.79	454,249.62
Cavite	77,847.32	83,912.66	68,798.52	88,822.62	106,177.77	110,811.40
Batangas	458,579.73	564,579.97	524,204.30	594,724.47	710,529.84	758,052.66
Occidental Mindoro	86,806.76	99,400.82	98,935.22	128,805.06	165,006.60	166,043.33

Localities	Mining and Quarrying at Current Prices					
	2018	2019	2020	2021	2022	2023
Palawan	38,806,465.68	32,812,741.47	22,483,489.45	35,552,679.49	55,453,156.09	26,286,054.35

**Table 2.B.13.** Value Added at Current Prices of Electricity, Steam, Water, and Waste Management in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Electricity, Steam, Water, and Waste Management at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	8,517,391.18	9,352,974.78	9,208,364.23	9,340,725.76	12,165,575.63	13,815,692.20
Ilocos Sur	4,276,370.89	4,758,834.39	4,585,211.99	4,673,453.00	6,048,600.49	6,670,539.31
La Union	8,162,996.74	9,031,312.79	8,582,659.06	8,762,373.28	11,328,840.53	12,695,632.53
Pangasinan	19,172,510.91	21,510,395.67	21,090,454.13	21,522,411.82	26,946,724.90	29,868,480.97
Cagayan	2,646,829.69	3,077,975.64	3,187,686.52	3,433,220.60	4,215,826.32	4,456,319.35
Batanes	118,524.13	141,757.42	141,653.70	149,485.15	175,624.76	187,707.92
Zambales	5,706,190.68	6,541,164.75	6,622,745.67	7,115,885.24	9,346,684.89	11,139,062.39
Bataan	11,583,206.87	13,374,793.34	13,415,285.17	15,002,158.76	19,410,325.37	22,338,083.00
Pampanga	11,550,330.19	13,005,488.92	13,012,009.64	14,303,476.13	17,924,043.29	21,328,513.57
Bulacan	11,402,845.89	12,997,494.82	13,226,241.20	13,969,130.11	17,545,104.62	20,974,550.68
NCR	89,675,048.03	99,362,853.48	90,302,412.72	92,298,621.28	97,268,593.15	113,054,723.58
Cavite	8,143,152.98	8,805,092.84	9,208,441.60	9,826,089.56	10,251,213.92	12,031,534.76
Batangas	49,769,816.84	53,357,519.73	52,578,164.08	58,577,104.09	67,159,198.21	76,987,567.70
Occidental Mindoro	3,143,033.15	3,423,458.65	3,346,202.80	3,653,716.59	4,157,754.63	4,985,167.97
Palawan	5,275,124.83	5,608,408.84	5,970,171.69	6,245,428.48	7,372,612.56	8,782,228.08

**Table 2.B.14.** Value Added at Current Prices of Construction in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025)

Localities	Construction at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	12,051,226.46	14,484,216.58	11,793,308.34	12,883,535.80	15,701,428.09	17,594,635.69
Ilocos Sur	13,781,143.07	16,919,959.70	12,863,374.57	16,983,294.60	18,873,343.03	21,437,368.67
La Union	19,315,241.12	21,597,641.08	19,732,347.43	23,872,617.62	25,246,571.03	28,873,379.98
Pangasinan	32,569,239.61	35,083,580.13	33,532,826.71	37,686,576.07	43,232,386.84	50,059,143.56
Cagayan	28,606,013.08	29,279,376.69	19,936,214.46	20,701,270.89	25,369,791.40	31,418,103.56
Batanes	679,353.47	857,732.03	756,530.79	967,713.50	1,138,998.81	1,363,816.27
Zambales	18,541,204.01	23,754,378.65	19,704,800.26	23,910,504.29	31,508,709.25	35,180,023.88
Bataan	34,975,011.78	38,182,005.49	24,269,867.88	26,717,031.45	31,381,696.09	35,709,660.37
Pampanga	45,736,631.57	50,150,075.14	38,061,676.22	47,771,903.46	60,923,503.50	69,747,068.35

Localities	Construction at Current Prices					
	2018	2019	2020	2021	2022	2023
Bulacan	93,150,759.44	109,347,229.81	80,448,630.85	80,626,989.16	100,299,980.09	115,137,448.94
NCR	257,110,627.68	306,290,371.07	246,094,017.67	271,074,220.55	304,430,580.02	322,595,779.31
Cavite	28,785,798.71	31,892,439.62	18,941,879.32	25,872,612.68	30,404,868.82	34,855,654.52
Batangas	21,103,834.53	23,191,791.74	18,671,475.35	21,834,242.12	25,566,294.47	30,934,510.15
Occidental Mindoro	6,012,873.41	5,095,388.37	4,592,891.77	5,378,573.32	6,365,830.72	7,236,669.00
Palawan	7,797,908.13	7,408,751.45	6,548,496.83	7,372,322.19	9,090,542.84	10,663,562.19

**Table 2.B.15.** Value Added at Current Prices of Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	12,177,826.07	13,669,805.23	13,549,233.88	14,462,271.11	16,789,914.86	19,494,889.67
Ilocos Sur	15,010,575.47	16,613,468.39	16,233,772.40	17,298,050.74	20,201,782.33	22,581,851.19
La Union	18,642,523.35	21,233,722.15	21,026,929.39	22,093,609.03	24,446,882.28	27,708,155.48
Pangasinan	50,068,420.03	55,948,887.00	54,578,310.61	56,668,485.35	65,114,635.87	72,778,393.88
Cagayan	16,664,559.90	17,806,453.10	17,434,626.04	18,555,121.52	21,651,343.35	24,203,139.63
Batanes	237,461.14	266,068.07	289,295.52	307,720.77	394,498.13	433,947.60
Zambales	18,885,112.31	20,365,866.68	18,653,597.82	18,645,310.39	21,811,253.26	24,043,529.74
Bataan	19,720,608.37	21,805,129.55	21,347,879.81	22,451,252.46	24,827,330.59	27,497,285.75
Pampanga	60,011,819.73	66,990,670.24	63,448,656.05	65,956,608.06	75,032,984.62	82,859,202.92
Bulacan	64,316,699.12	68,815,190.65	67,275,597.69	69,072,669.29	76,931,034.70	85,536,073.02
NCR	1,309,125,634.32	1,422,206,846.53	1,301,144,789.75	1,382,042,733.04	1,552,955,566.27	1,713,958,489.10
Cavite	102,432,986.42	110,042,044.95	102,480,338.68	106,288,687.02	119,918,456.76	136,021,585.01
Batangas	44,560,128.25	47,555,954.57	44,020,781.16	46,241,589.04	55,981,664.43	63,512,695.17
Occidental Mindoro	5,558,088.20	6,258,928.60	6,474,802.99	6,631,886.64	7,547,208.95	8,556,689.45
Palawan	14,907,550.31	17,547,464.14	17,705,119.15	18,060,829.50	21,335,229.82	23,960,120.56

**Table 2.B.16.** Value Added at Current Prices of Transportation and Storage in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025)

Localities	Transportation and Storage at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	4,531,737.73	4,401,783.36	2,186,255.79	2,045,679.36	4,254,381.18	5,092,558.54
Ilocos Sur	1,896,192.04	1,878,400.58	1,366,459.12	1,334,385.51	1,695,504.64	2,749,742.00
La Union	3,381,256.78	3,368,697.84	2,429,877.49	2,529,985.20	3,351,347.86	4,348,522.55
Pangasinan	10,654,543.86	11,260,687.97	8,258,539.27	8,567,903.80	10,671,811.21	11,761,859.36

Localities	Transportation and Storage at Current Prices					
	2018	2019	2020	2021	2022	2023
Cagayan	9,870,461.20	9,728,699.98	5,964,575.74	6,270,166.37	8,885,072.21	10,163,254.01
Batanes	949,685.96	915,723.98	457,508.42	373,794.33	570,515.53	918,354.90
Zambales	8,497,005.65	8,750,725.25	7,470,914.06	7,998,758.43	9,605,143.14	12,277,856.03
Bataan	7,158,689.51	7,433,842.22	6,514,759.30	7,211,344.64	8,549,758.12	10,393,384.46
Pampanga	25,864,336.69	27,857,456.98	21,098,517.33	23,326,842.25	29,207,811.98	35,269,619.41
Bulacan	19,580,039.38	20,375,321.85	18,267,623.60	20,440,662.26	23,884,630.61	28,630,983.44
NCR	149,376,555.87	151,711,031.24	104,217,761.01	112,514,501.25	160,215,981.57	187,277,601.61
Cavite	25,668,470.70	27,361,689.92	25,156,343.13	28,728,180.38	34,280,870.99	38,668,678.61
Batangas	14,699,354.31	16,372,360.79	14,137,133.48	15,932,168.75	19,035,790.78	21,725,547.65
Occidental Mindoro	2,474,850.27	2,807,760.01	2,278,616.78	2,210,098.74	2,624,442.66	2,916,868.78
Palawan	12,931,003.00	14,033,315.38	9,750,546.66	9,406,742.75	16,429,237.81	18,774,591.29

**Table 2.B.17.** Value Added at Current Prices of Accommodation and Food Service Activities in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Accommodation and Food Service Activities at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	2,807,865.08	3,036,163.37	1,879,424.08	2,275,801.60	3,026,529.68	3,888,511.57
Ilocos Sur	2,684,375.26	2,932,049.26	1,805,394.83	2,131,555.95	3,255,630.37	4,090,437.27
La Union	3,061,295.28	3,282,503.87	1,617,532.19	1,910,777.00	2,961,377.87	3,558,868.29
Pangasinan	10,834,361.44	11,521,048.75	6,498,915.18	7,583,989.88	10,951,506.73	13,499,490.42
Cagayan	2,864,828.35	3,171,678.24	1,677,314.13	2,120,675.50	3,328,766.02	4,058,420.78
Batanes	339,194.70	405,402.38	252,591.71	301,174.08	407,012.98	530,055.12
Zambales	3,617,413.96	3,762,931.06	2,205,631.14	2,489,051.42	3,534,185.69	4,713,759.57
Bataan	4,545,102.39	4,926,209.24	3,023,493.85	3,517,838.43	4,849,182.88	6,199,633.81
Pampanga	19,314,063.85	20,059,329.81	11,338,120.97	13,394,467.58	18,972,731.90	25,292,173.86
Bulacan	12,649,973.54	13,622,541.63	7,386,427.79	9,023,867.13	12,114,208.45	16,757,016.83
NCR	110,538,628.59	113,000,796.23	58,412,776.32	58,278,078.05	77,076,648.09	97,612,255.57
Cavite	11,710,465.19	12,087,944.70	8,576,183.09	11,781,147.56	15,212,732.03	19,713,309.56
Batangas	6,856,484.44	7,295,735.68	4,659,742.63	6,315,678.29	8,967,591.64	11,476,194.74
Occidental Mindoro	506,452.69	507,078.00	288,437.27	321,934.43	429,496.25	535,876.12
Palawan	6,335,248.82	7,586,600.47	4,322,414.66	4,354,829.50	6,762,162.91	9,636,136.53

**Table 2.B.18.** Value Added at Current Prices of Information and Communication in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Information and Communication at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	2,852,710.22	3,000,519.78	3,128,230.13	3,391,751.69	3,636,273.67	3,937,442.40
Ilocos Sur	2,691,001.66	2,789,143.38	2,940,254.98	3,103,645.91	3,232,858.11	3,523,167.48
La Union	4,144,857.86	4,272,545.71	4,517,313.69	4,784,808.57	5,112,111.44	5,488,280.13
Pangasinan	11,222,401.77	11,703,284.26	12,289,543.78	13,418,402.67	14,162,963.00	15,234,596.85
Cagayan	4,560,552.61	5,037,552.80	5,342,760.78	5,880,650.27	6,210,803.13	6,879,939.20
Batanes	151,735.17	168,292.45	185,637.48	208,002.53	213,639.03	231,273.83
Zambales	5,262,135.76	5,912,399.59	6,726,815.80	7,434,364.58	8,103,602.20	8,703,805.51
Bataan	5,010,580.79	5,986,139.88	6,879,815.39	7,631,691.07	8,462,464.56	8,898,228.28
Pampanga	20,280,979.07	23,669,811.43	26,146,292.26	28,521,111.35	30,774,081.23	32,707,480.17
Bulacan	20,172,406.34	23,519,084.30	26,766,091.90	30,300,246.99	33,396,129.90	35,557,278.92
NCR	133,735,290.19	146,375,899.52	146,443,523.83	154,358,842.67	165,718,040.49	171,873,049.58
Cavite	27,974,549.59	30,370,378.26	33,371,494.24	38,485,080.96	42,413,828.24	43,771,790.94
Batangas	16,815,319.37	18,218,152.41	20,005,893.72	22,838,146.56	24,818,325.04	26,063,854.86
Occidental Mindoro	1,104,247.62	1,252,610.67	1,319,589.02	1,509,398.04	1,651,813.96	1,757,574.61
Palawan	6,267,835.62	6,781,695.23	7,136,324.27	7,549,648.29	7,986,130.44	8,636,996.02

**Table 2.B.19.** Value Added at Current Prices of Financial and Insurance Activities in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Financial and Insurance Activities at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	2,868,219.00	3,318,802.17	3,666,938.39	3,981,271.93	4,450,361.00	5,059,036.50
Ilocos Sur	3,467,596.06	3,803,184.12	4,179,148.15	4,661,783.84	5,388,385.89	6,122,531.06
La Union	2,802,976.26	3,255,836.26	3,697,162.30	4,061,595.83	4,388,491.75	4,978,502.23
Pangasinan	10,739,078.03	12,257,113.72	13,740,696.85	14,624,615.93	15,847,576.27	18,528,561.84
Cagayan	3,202,883.51	3,709,103.03	4,152,105.89	4,417,246.02	5,038,438.72	5,757,956.67
Batanes	84,413.41	104,503.68	116,258.20	122,672.79	145,267.13	163,628.79
Zambales	4,285,213.32	4,862,365.35	5,303,041.83	5,591,407.27	6,223,252.40	7,079,141.67
Bataan	4,893,663.86	5,338,990.41	5,899,200.04	6,458,321.54	7,225,154.53	8,520,159.81
Pampanga	19,261,752.41	21,551,658.22	24,341,281.86	26,287,548.26	29,087,811.41	34,531,757.55
Bulacan	13,463,966.14	15,114,692.80	16,385,666.17	17,480,265.18	19,966,464.94	24,002,277.22
NCR	931,729,905.59	1,032,701,128.54	1,107,545,269.36	1,183,646,604.18	1,335,758,232.30	1,532,893,897.77
Cavite	27,773,496.68	31,290,124.82	34,864,752.72	38,302,661.18	43,861,633.47	52,594,585.24
Batangas	20,832,525.79	23,441,939.36	25,115,156.74	27,483,803.43	30,438,327.18	37,325,921.65
Occidental Mindoro	2,622,756.06	2,877,212.59	3,281,202.21	3,515,555.33	3,766,325.62	4,321,428.18
Palawan	5,399,365.15	6,075,935.00	6,974,059.96	7,506,808.83	7,884,054.41	9,233,045.87

**Table 2.B.20.** Value Added at Current Prices of Real Estate and Ownership of Dwellings in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Real Estate and Ownership of Dwellings at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	5,570,980.32	5,845,945.58	5,244,490.28	5,456,913.06	5,810,224.78	6,268,275.43
Ilocos Sur	6,062,976.50	6,439,966.14	5,601,793.35	5,955,127.27	6,501,200.63	7,170,640.80
La Union	7,563,116.06	7,854,081.71	6,624,772.30	6,875,463.87	7,324,036.91	8,154,768.96
Pangasinan	21,937,260.44	22,997,899.03	20,352,902.80	21,376,777.12	23,241,392.08	25,410,388.56
Cagayan	6,832,329.35	7,283,825.84	6,708,354.54	7,225,928.65	7,501,854.61	8,373,054.61
Batanes	128,758.69	135,667.62	136,374.76	146,068.18	157,034.06	166,445.81
Zambales	8,719,484.96	9,429,949.65	7,845,057.62	8,291,716.56	9,201,318.41	10,008,137.47
Bataan	9,751,396.15	10,433,866.14	8,378,923.92	8,817,658.44	9,907,927.97	10,943,214.77
Pampanga	44,618,480.09	49,879,436.41	38,395,924.23	40,725,172.85	45,412,562.69	51,610,669.55
Bulacan	34,376,178.94	36,466,601.52	29,623,178.82	30,477,159.67	33,479,148.06	37,406,319.91
NCR	411,500,203.14	434,540,269.24	364,799,686.20	388,489,883.14	429,588,238.57	471,552,062.16
Cavite	47,599,817.10	49,791,744.41	44,267,621.09	46,933,484.35	50,613,170.79	57,270,963.89
Batangas	39,976,235.45	41,968,227.24	34,888,719.23	36,559,682.63	40,547,595.67	45,338,693.03
Occidental Mindoro	1,122,229.49	1,225,976.37	1,187,037.54	1,269,488.57	1,360,268.46	1,473,555.68
Palawan	5,620,329.64	6,023,700.46	5,772,878.35	5,976,701.27	6,393,380.94	6,838,719.98

**Table 2.B.21.** Value Added at Current Prices of Professional and Business Services in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Professional and Business Services at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	1,316,771.48	1,335,057.13	1,236,421.28	1,287,721.22	1,409,052.88	1,600,532.54
Ilocos Sur	1,177,819.09	1,194,301.46	1,093,353.32	1,125,686.59	1,205,392.90	1,331,905.04
La Union	1,919,253.30	1,943,708.82	1,793,729.16	1,863,164.05	2,033,438.01	2,271,367.10
Pangasinan	6,017,824.90	6,146,581.85	5,734,639.66	6,020,917.81	6,617,513.13	7,287,291.03
Cagayan	1,190,909.87	1,250,644.55	1,200,456.33	1,341,530.29	1,449,715.59	1,638,153.31
Batanes	103,606.43	106,336.49	99,390.22	109,583.70	120,429.77	139,574.90
Zambales	2,615,667.52	2,778,431.72	2,583,400.16	2,793,064.42	3,055,484.94	3,449,930.60
Bataan	8,779,371.56	9,148,676.46	8,496,396.77	9,316,422.05	10,280,983.39	11,716,342.63
Pampanga	56,887,351.80	61,222,841.13	56,940,761.94	61,404,986.89	67,527,643.55	75,208,071.91
Bulacan	25,528,203.74	27,473,641.93	24,986,983.07	27,218,167.30	30,223,366.30	33,534,540.89
NCR	763,216,236.08	802,257,072.89	749,267,151.77	807,630,295.22	895,529,680.50	978,264,419.87
Cavite	20,800,969.11	21,598,527.63	18,924,423.65	20,287,393.78	22,847,963.05	25,234,834.93
Batangas	11,196,247.13	11,482,621.85	9,721,708.05	10,332,573.89	11,342,257.70	12,325,537.50
Occidental Mindoro	592,816.33	691,001.13	720,531.00	747,968.14	813,498.35	906,637.83

Localities	Professional and Business Services at Current Prices					
	2018	2019	2020	2021	2022	2023
Palawan	1,546,405.64	1,687,849.23	1,726,953.30	1,902,304.26	2,094,328.48	2,338,897.77

**Table 2.B.22.** Value Added at Current Prices of Public Administration & Defense and Compulsory Social Activities in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025)

Localities	Public Administration & Defense and Compulsory Social Activities at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	2,289,206.87	2,701,138.43	2,879,367.50	3,010,480.78	3,275,611.96	3,652,679.19
Ilocos Sur	2,930,035.57	3,243,227.52	3,576,090.14	3,812,171.88	4,254,959.42	4,820,104.78
La Union	4,674,563.69	5,396,622.58	5,621,828.65	6,045,851.05	6,633,604.03	7,567,375.30
Pangasinan	7,127,858.49	8,105,775.57	8,649,259.16	8,954,329.61	9,822,176.44	11,212,538.83
Cagayan	3,968,677.63	4,392,253.65	4,483,865.59	5,018,095.03	5,516,314.75	6,035,458.75
Batanes	325,814.76	372,648.30	385,798.75	436,935.88	470,406.08	504,240.02
Zambales	3,454,199.64	3,888,143.23	4,139,430.43	4,464,996.57	5,095,935.18	5,267,065.23
Bataan	2,606,164.19	2,997,995.58	3,097,208.81	3,669,475.21	4,210,280.63	4,218,125.23
Pampanga	10,979,101.92	11,745,908.03	12,606,292.29	14,582,795.80	16,547,818.21	16,452,313.19
Bulacan	6,913,749.26	8,100,079.62	7,938,963.94	8,725,727.72	9,459,066.57	9,201,839.34
NCR	435,304,730.22	509,592,978.92	549,937,699.42	585,210,005.35	634,922,769.03	652,711,226.25
Cavite	10,328,054.71	12,348,475.01	13,838,587.96	15,900,490.30	17,603,548.59	18,850,742.84
Batangas	12,512,494.39	14,094,534.43	14,475,672.97	16,600,185.97	17,823,518.54	19,653,942.14
Occidental Mindoro	1,628,708.17	1,626,429.83	1,762,772.59	1,899,951.45	2,171,925.77	2,549,677.02
Palawan	4,800,883.77	5,064,530.99	5,437,647.43	5,560,940.62	6,149,415.67	7,292,329.34

**Table 2.B.23.** Value Added at Current Prices of Education in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025)

Localities	Education at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	4,262,017.55	4,497,602.95	4,341,818.25	4,766,401.82	5,239,117.70	5,966,938.22
Ilocos Sur	4,832,353.42	5,092,227.02	5,024,214.28	5,444,582.37	6,079,808.48	6,745,135.13
La Union	5,592,733.97	5,790,141.42	5,411,406.96	5,921,328.81	6,511,213.36	7,115,248.34
Pangasinan	20,382,188.77	21,390,056.01	20,476,395.65	22,568,195.55	24,576,213.59	26,486,419.20
Cagayan	8,465,164.85	8,758,648.70	8,493,824.09	9,488,062.89	10,458,368.22	11,223,377.67
Batanes	329,456.70	334,225.12	333,658.08	381,349.16	418,126.07	454,308.62
Zambales	5,578,677.60	5,795,420.67	5,643,059.64	6,186,190.02	6,850,312.69	7,497,519.80
Bataan	5,265,318.39	5,384,194.36	5,192,017.09	5,726,490.58	6,407,819.34	7,066,099.87
Pampanga	16,878,490.50	17,395,860.28	17,141,826.78	18,379,682.07	20,240,502.48	22,235,871.68

Localities	Education at Current Prices					
	2018	2019	2020	2021	2022	2023
Bulacan	20,352,896.44	20,608,463.66	19,877,921.27	21,666,088.94	23,794,456.09	26,209,327.78
NCR	149,189,048.92	160,634,199.11	118,294,644.33	130,602,551.76	141,931,543.98	159,239,357.20
Cavite	26,979,050.14	27,931,699.16	27,497,341.86	30,185,204.77	33,280,062.27	36,453,103.98
Batangas	18,170,997.01	19,017,223.02	18,662,079.35	20,710,894.16	23,399,721.47	26,756,167.00
Occidental Mindoro	2,907,861.07	2,991,391.23	3,020,497.08	3,412,872.75	3,775,043.73	4,123,143.74
Palawan	7,032,909.93	7,011,221.08	7,000,423.06	7,925,949.41	8,702,548.48	9,628,384.96

**Table 2.B.24.** Value Added at Current Prices of Human Health and Social Work Activities in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025)

Localities	Human Health and Social Work Activities at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	1,395,085.79	1,480,416.99	1,616,578.54	1,946,636.78	2,106,275.13	2,343,230.21
Ilocos Sur	2,340,862.80	2,559,238.29	2,752,958.83	3,250,125.82	3,619,222.73	4,037,544.82
La Union	1,984,139.50	2,105,573.76	2,246,646.38	2,716,609.49	2,948,342.23	3,252,021.55
Pangasinan	6,056,627.02	6,653,781.69	6,968,978.57	8,803,390.78	9,461,676.02	10,416,624.19
Cagayan	2,592,824.43	3,035,481.24	3,310,532.53	4,041,659.98	4,251,183.32	4,766,774.47
Batanes	116,025.72	136,359.86	156,760.01	182,089.89	194,975.37	217,044.43
Zambales	1,166,065.01	1,248,475.04	1,347,093.86	1,702,834.60	1,859,356.10	2,038,756.23
Bataan	1,638,730.86	1,811,043.88	1,884,849.61	2,427,724.86	2,565,985.46	2,881,916.52
Pampanga	8,179,193.33	8,929,549.27	8,841,408.32	11,309,657.39	12,030,706.29	13,481,115.48
Bulacan	6,122,217.26	6,559,773.16	6,662,946.25	8,541,106.82	9,152,585.03	10,074,032.40
NCR	107,408,616.21	112,958,116.75	111,586,939.82	124,422,924.35	129,781,500.05	146,838,075.65
Cavite	8,595,653.82	9,338,655.62	8,188,783.97	10,233,409.15	10,901,700.92	12,012,736.11
Batangas	6,205,688.87	6,851,075.37	5,830,130.08	7,145,654.03	7,606,299.92	8,484,973.61
Occidental Mindoro	445,411.58	520,283.56	555,048.05	664,955.69	738,288.14	803,297.13
Palawan	1,855,329.20	2,002,890.43	2,155,065.54	2,745,775.74	3,020,311.35	3,272,547.36

**Table 2.B.25.** Value Added at Current Prices of Other Services in Different Localities from 2018 to 2023 (Philippine Statistics Authority, 2025).

Localities	Other Services at Current Prices					
	2018	2019	2020	2021	2022	2023
Ilocos Norte	1,516,857.93	1,671,853.16	844,170.17	916,714.76	1,358,889.60	1,791,597.10
Ilocos Sur	1,381,901.44	1,605,788.90	1,050,738.03	1,105,575.78	1,508,118.22	1,867,755.23
La Union	3,212,624.54	3,672,392.34	2,313,795.67	2,497,275.19	3,224,124.65	3,828,044.74
Pangasinan	7,648,018.16	8,751,180.27	5,253,075.11	5,428,179.37	7,713,252.70	9,166,889.95

Localities	Other Services at Current Prices					
	2018	2019	2020	2021	2022	2023
Cagayan	1,712,591.93	1,950,523.57	704,011.65	721,345.15	837,508.18	1,114,762.83
Batanes	94,573.06	109,900.75	52,860.81	50,849.66	63,430.98	79,417.11
Zambales	6,428,362.06	6,717,319.92	3,819,443.74	3,954,194.51	5,433,024.61	7,343,086.38
Bataan	6,760,223.03	7,652,273.36	5,296,074.52	5,292,883.23	6,352,735.65	8,465,314.64
Pampanga	17,636,347.60	19,284,404.55	12,791,861.82	13,114,500.79	16,152,027.81	21,970,104.09
Bulacan	13,678,740.40	14,966,820.24	11,586,114.33	11,706,112.92	14,676,286.77	20,003,525.91
NCR	176,236,765.65	179,140,305.09	92,668,023.53	95,335,166.45	130,790,323.57	163,596,339.82
Cavite	11,279,460.17	14,262,358.31	9,565,655.80	9,801,381.66	13,962,292.47	17,770,292.93
Batangas	7,491,103.25	9,307,342.17	6,338,175.61	6,504,882.38	9,007,274.52	11,386,609.86
Occidental Mindoro	1,320,162.20	1,468,664.09	1,418,413.39	1,506,882.70	1,734,910.75	2,242,168.92
Palawan	5,900,308.32	6,845,731.21	6,061,127.97	6,214,365.94	7,177,519.53	9,172,044.35

## Annex 2.C. Climate-Related Threats Database

**Table 2.C.1.** Reported Deaths Caused by Tropical Cyclones and Typhoons in 2024 (Sources: Adriano, 2024; Argosino, 2024; Baccay, 2024; Chavez, 2024; Citizens Disaster Response Center, 2024; Corrales, 2024; Delizo, 2024; Mallari et al., 2024; Ombay, 2024; Peralta-Malonzo, 2024; Philippine Daily Inquirer, 2024; Reyes & Corrales, 2024; Rita, 2024; Serquiña, 2024; Tupas, 2024).

Localities	Reported Deaths (2024)							Total Deaths
	Typhoon 'Gaemi' (Carina) and 'Butchoy' (Prapiroon)	Typhoon 'Man-yi' (Pepito)	Tropical cyclone 'Ewiniar' (Aghon)	Typhoon 'Yinxing' (Marce)	Typhoon 'Yagi' (Enteng)	Tropical cyclone 'Trami' (Kristine)	Tropical cyclone 'Krathon' (Julian)	
Ilocos Norte	0	0	Not affected	0	0	0	3	3
Ilocos Sur	0	0	Not affected	0	0	0	2	2
La Union	3	0	Not affected	0	0	1	0	4
Pangasinan	0	0	Not affected	0	0	0	0	0
Cagayan	0	0	0	1	0	0	1	2
Batanes	0	0	0	0	0	0	0	0
Zambales	0	0	0	0	0	1	0	1
Bataan	0	0	0	0	0	0	0	0
Pampanga	2	0	0	0	0	0	0	2
Bulacan	1	0	0	0	0	0	0	1
NCR	7	Not affected	Not affected	Not affected	0	0	Not affected	7
Cavite	3	0	0	Not affected	0	2	Not affected	5
Batangas	5	0	0	Not affected	0	59	Not affected	64
Occidental Mindoro	0	Not affected	0	Not affected	0	0	Not affected	0
Palawan	0	Not affected	0	Not affected	0	0	Not affected	0

**Table 2.C.2.** Exposed Population to Hazards of Localities in 2021 (Pacific Disaster Center, 2021)

Localities	Expanded Population (2021)				
	Storm Surge	Typhoon Winds	Tsunami	Flooding	Landslide
Ilocos Norte	52,043	602,529	21,214	288,430	48,052
Ilocos Sur	198,424	695,732	27,226	357,295	85,180
La Union	171,657	774,641	1,943	414,075	108,773
Pangasinan	418,948	3,012,852	2,779	2,519,870	33,433
Cagayan	133,166	1,214,848	30,602	761,769	57,810
Batanes	770	16,892	2,605	N/A	7,350
Zambales	364,969	817,210	9,232	536,358	47,034
Bataan	246,213	732,954	23,170	650,483	39,676
Pampanga	41,754	2,394,057	17,077	2,369,805	18,317
Bulacan	133,976	3,049,630	3,864	2,315,664	40,519
NCR	2,763,038	5,537,318	83,777	9,020,292	13
Cavite	618,628	3,588,574	51,671	1,583,688	79,389
Batangas	231,741	2,618,273	2,675	295,130	295,130
Occidental Mindoro	225,885	508,887	7,607	435,832	61,925
Palawan	265,452	711,283	28,707	561,330	140,555

**Table 2.C.2.** (Continuation...)

Localities	Expanded Population (2021)				
	Earthquake	Liquefaction	Volcanic Eruption	Wildfire	Drought
Ilocos Norte	574,459	428,177	No Data	57,438	559,690
Ilocos Sur	657,276	545,463	No Data	27,501	No Data
La Union	657,076	463,376	No Data	30,686	No Data
Pangasinan	2,901,032	2,493,193	5,270	288,385	No Data
Cagayan	1,157,750	920,953	14,030	64,746	1,189,166
Batanes	No Data	No Data	9,221	No Data	No Data
Zambales	742,845	606,064	5,682	297,349	No Data
Bataan	713,792	345,695	2,371	26,308	No Data
Pampanga	2,394,038	2,272,356	25,369	392,777	No Data
Bulacan	3,046,986	1,505,029	9,146	459,719	8,088
NCR	12,556,544	5,714,230	37,861	5,537,318	No Data
Cavite	3,448,145	1,160,444	25,798	57.8 million	No Data
Batangas	2,499,998	345,203	132,997	107,625	No Data
Occidental Mindoro	396,699	253,862	366	145,385	1,776
Palawan	No Data	395,160	No Data	56,465	659,707

**Table 2.C.3.** Exposed Capitals to Hazards of Localities in 2021 (Pacific Disaster Center, 2021)

Localities	Exposed Capital (USD) (2021)				
	Storm Surge	Typhoon Winds	Tsunami	Flooding	Landslide
Ilocos Norte	170,200,000	3,100,000,000	51,900,000	1,600,000,000	108,200,000
Ilocos Sur	1,300,000,000	3,600,000,000	59,300,000	2,300,000,000	217,300,000
La Union	1,200,000,000	4,400,000,000	2,400,000	2,700,000,000	332,000,000
Pangasinan	1,900,000,000	14,900,000,000	7,900,000	12,600,000,000	166,800,000
Cagayan	617,700,000	8,200,000,000	163,100,000	6,400,000,000	156,000,000
Batanes	Not Applicable	55,500,000	1,600,000	Not Applicable	27,000,000
Zambales	782,300,000	1,500,000,000	4,300,000	912,600,000	73,400,000
Bataan	870,600,000	1,900,000,000	8,900,000	1,700,000,000	72,600,000
Pampanga	16,000,000	5,500,000,000	5,800,000	5,500,000,000	25,400,000
Bulacan	2,000,000,000	13,100,000,000	5,200,000	10,500,000,000	27,200,000
NCR	33,700,000,000	5,537,318	434,500,000	119,600,000,000	Not Applicable
Cavite	1,700,000,000	3,588,574	32,200,000	6,300,000,000	101,100,000
Batangas	744,700,000	6,900,000,000	6,600,000	295,130	295,130
Occidental Mindoro	343,800,000	1,200,000,000	7,600,000	1,100,000,000	129,200,000
Palawan	321,000,000	1,100,000,000	10,200,000	1,100,000,000	310,100,000

**Table 2.C.3.** (Continuation...)

Localities	Exposed Capital (USD) (2021)				
	Earthquake	Liquefaction	Volcanic Eruption	Wildfire	Drought
Ilocos Norte	3,000,000,000	2,400,000,000	<10,000	353,300,000	2,900,000,000

Ilocos Sur	3,500,000,000	3,200,000,000	Not Applicable	92,900,000	Not Applicable
La Union	3,800,000,000	3,000,000,000	Not Applicable	184,200,000	Not Applicable
Pangasinan	14,700,000,000	12,500,000,000	26,300,000	1,700,000,000	Not Applicable
Cagayan	8,000,000,000	7,200,000,000	49,400,000	499,100,000	8,200,000,000
Batanes	Not Applicable	Not Applicable	19,700,000	Not Applicable	Not Applicable
Zambales	1,400,000,000	1,200,000,000	15,600,000	711,200,000	Not Applicable
Bataan	1,800,000,000	1,200,000,000	6,000,000	20,000,000	Not Applicable
Pampanga	5,500,000,000	4,900,000,000	74,800,000	682,800,000	Not Applicable
Bulacan	13,100,000,000	7,400,000,000	39,200,000	2,900,000,000	970,487
NCR	156,100,000,000	74,200,000,000	472,000,000	5,537,318	Not Applicable
Cavite	10,300,000,000	4,700,000,000	57,800,000	6,800,000,000	Not Applicable
Batangas	6,800,000,000	1,200,000,000	290,500,000	416,500,000	Not Applicable
Occidental Mindoro	1,100,000,000	728,500,000	637,485	444,900,000	3,500,000
Palawan	Not Applicable	679,000,000	Not Applicable	154,000,000	1,500,000,000