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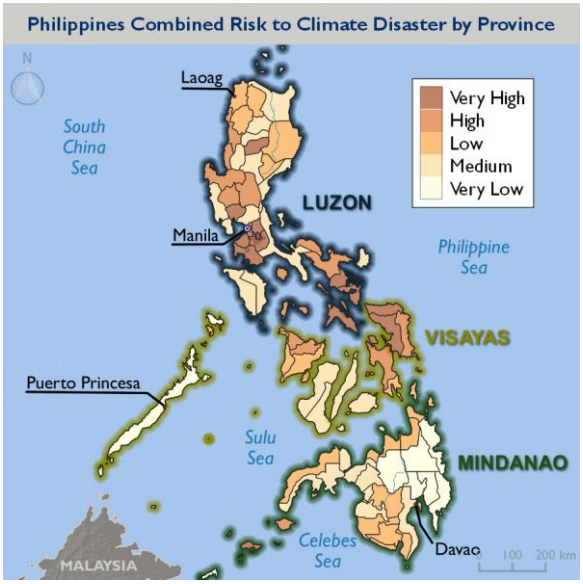
FACT SHEET

CLIMATE CHANGE RISK PROFILE
PHILIPPINES

COUNTRY OVERVIEW



The Philippines is highly vulnerable to the impacts of climate change, including sea level rise, increased frequency of extreme weather events, rising temperatures and extreme rainfall. This is due to its high exposure to natural hazards (cyclones, landslides, floods, droughts), dependence on climate-sensitive natural resources, and vast coastlines where all major cities and the majority of the population reside. The urban poor, many of whom live in temporary shelters, are most at risk, lacking the resources to prevent or mitigate the threat of coastal inundation and storm surge. Consisting of 7,107 islands divided into three island groups (Luzon, Visayas and Mindanao), the Philippines lies in the world's most cyclone-prone region, averaging 19–20 cyclones each year, of which 7–9 make landfall. Sea levels in the Philippines are rising faster than the global average, increasing the hazard posed by storm surges and threatening permanent inundation of low-lying areas. Services, agriculture and industry are the main economic sectors, employing 55, 29, and 16 percent of the workforce, respectively. A rich yet increasingly depleted natural and marine resources base supports livelihoods through fisheries, agriculture, forestry, energy, mining and tourism and provides critical ecosystem services such as shoreline protection, flood control, soil stability and habitats for biodiversity. (2, 9, 11)

CLIMATE PROJECTIONS

- 1.8°–2.2°C increase in temperatures by 2050
- Wetter wet season, drier dry season
- Increased incidence of extreme weather and hazard events
- 0.48-0.65 m rise in sea levels by 2100

KEY CLIMATE IMPACTS

Agriculture
Crop loss/failure; soil erosion
Increased pest infestations
Rising food prices & food imports

Water
Water shortages
Degraded water quality
Increased flood & landslide risk

Energy
Reduced energy production potential
Increased demand for energy services

Coastal Ecosystems
Loss of coastal defense, marine habitat & biodiversity
Reduced fish populations

Infrastructure/Services
Damage to roads, bridges, and water and sanitation facilities

Human Health
Loss of life and livelihoods
Increased risk of vector-/waterborne disease and population displacement

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This document was prepared under the Climate Change Adaptation, Thought Leadership and Assessments (ATLAS) Task Order No. AID-OAA-I-14-00013 and is meant to provide a brief overview of climate risk issues. The key resources at the end of the document provide more in-depth country and sectoral analysis. The contents of this report do not necessarily reflect the views of USAID.

CLIMATE SUMMARY

The Philippines' climate is tropical and monsoonal, and highly influenced by the El Niño Southern Oscillation, which is the most important source of rainfall variability from year to year. Temperatures average 24°–27°C throughout the year and are warmest in May and coolest in January. Rainfall patterns exhibit high annual and regional variability, with mean annual rainfall varying from 960 mm in southeast Mindanao to over 4,000 mm in central Luzon. Most of the country experiences a dry season from December–May and a cyclonic rainy season from June–November that starts with the arrival of the southwest monsoon. A second rainy season occurs from December–February on the eastern and northern coasts with the arrival of the northeast monsoon. El Niño events, which occur irregularly every 2–7 years, reduce rainfall and weaken cyclone activity. La Niña events, which occur less frequently, increase heavy rainfall and cyclone activity. (4, 7, 11, 12)

HISTORICAL CLIMATE

Historic climate trends include:

- An increase in average temperature of 0.65°C from 1951–2010, with greatest increases in northern and southern regions.
- Increased number of "hot" days/decreased number of "cold nights" from 1951–2010.
- Increased number of cyclones during El Niño years and a slight increase of cyclone passage over Visayas since the 1970s.
- Increased sea surface temperatures of 0.6°–1°C since 1910, with most significant warming occurring after the 1970s.
- Sea level rise of 0.15 meters since 1940.

FUTURE CLIMATE

Projected changes in climate by 2050 include:

- Increased temperatures of 1.8°–2.2°C.
- Reduced rainfall from March–May in most areas, making the dry season drier.
- Increased heavy and extreme rainfall in Luzon and Visayas during the southwest monsoon, making the wet season wetter, but decreasing rainfall trends for most of Mindanao.
- Increased frequency of extreme weather events, including days exceeding 35°C, days with less than 2.5 mm of rain, and days exceeding 300 mm of rain.
- Rising sea levels of 0.48–0.65 meters by 2100.

SECTOR IMPACTS AND VULNERABILITIES

AGRICULTURE

Agriculture is the dominant livelihood for the rural poor and contributes 12 percent to GDP. Production of staple crops, such as rice and corn, and cash crops (e.g., coconut) will be negatively impacted by a changing climate, especially increased temperatures, which accelerate evapotranspiration rates and can reduce yields through heat and water stress. Rice, wheat and corn yields will likely decline by 10 percent for every 1°C increase over 30°C. Droughts are linked to increased pest infestations, especially during El Niño years. Cyclones and heavy rains bring severe flooding and increase runoff and soil erosion, reducing soil fertility, damaging crops and altering productivity, especially during La Niña years. From 2006–2013, the Philippines was struck by 75 disasters– mostly cyclones, tropical storms and floods– that caused $3.8 billion in accumulated damage and losses to the agriculture sector. An estimated annual GDP loss of up to 2.2 percent is projected by 2100 due to climate impacts on agriculture. (1, 3, 10, 15)

Climate Stressors and Climate Risks AGRICULTURE

Stressors	Risks
Increased temperatures **Increased rainfall variability** **Increased frequency of extreme weather events** **Sea level rise**	Increased heat stress and reduced yields
	Increased pest infestations
	Increased frequency of crop and/or productivity loss from floods and droughts
	Failure of rainfed crops and increased need for irrigation
	Higher food prices and increased demand for imports
	Reduced soil and crop productivity through nutrient leaching, erosion and runoff
	Loss of arable land and irrigation water to salinity

WATER RESOURCES

Climate variability is already leading to water stress by reducing the quality and quantity of available water supplies. Droughts reduce water inflows to watersheds and create shortages for agricultural, industrial and municipal users who account for 82, 10 and 8 percent of water withdrawals, respectively. Floods and landslides, a result of extreme rainfall, increase runoff, reduce water quality and damage water supply infrastructure. Saltwater intrusion of coastal aquifers affects water quality in about 25 percent of coastal municipalities in Luzon, Visayas and Mindanao; this is expected to increase with sea level rise. (7, 10, 15)

ENERGY

Climate change could impact the Philippines' energy supply, as well as increase demand. Hydropower production, which contributes 20 percent to the country's energy supply, is vulnerable to reduced water availability from climate change. For example, in 2010 production dropped by 20 percent compared to the previous year due to a drought. Other critical energy infrastructure, like the offshore natural gas field of Malampaya, is vulnerable to more intense and frequent storms. (2, 11)

COASTAL ECOSYSTEMS

Coupled with extensive environmental degradation and deforestation, climate change threatens the country's valuable coastal ecosystems and fisheries. Increased salinity and sea levels can damage mangroves while ocean acidification and rising seas and sea surface temperatures can destroy fish and marine habitats, particularly through coral bleaching (around 95 percent of corals suffered bleaching during the 2009–10 El Niño). More than 60 percent of the coastal population's livelihoods depend on marine resources, and coral reefs and mangroves are valued at $2 billion and $83 million per year, respectively, for their contributions to fishing, tourism and storm protection. (6, 7, 8, 10, 11, 14)

URBAN INFRASTRUCTURE

High temperatures, heavy rainfall and strong winds are likely to impact the Philippine's infrastructure and services in urban and peri-urban areas, where over 60 percent of the population resides. Tropical Storm Ketsana caused $33 million in repairs to roads and bridges in 2009. Extreme weather also poses risks to water and sanitation facilities. Rising sea levels threaten infrastructure and settlements in 25 cities located along the coastline. (16, 17)

Climate Stressors and Climate Risks WATER RESOURCES

Stressors	Risks
Increased temperatures	Reduced river flows and water levels, reducing water quality and seasonal supplies
	Water shortages and disrupted provision of water supplies
Increased incidence of drought and severe weather events	Increased incidence of floods and landslides, degrading watershed health and reducing water quality
	Increased sedimentation of reservoirs from runoff and erosion
Sea level rise	Saltwater intrusion of freshwater coastal aquifers

Climate Stressors and Climate Risks ENERGY

Stressors	Risks
Increased temperatures	Reduced hydropower production
	Damage to energy infrastructure; disruption to services
Increased incidence of drought and severe weather events	Increased incidence of power outages and resultant economic losses
	Increased demand for energy services, particularly cooling

Climate Stressors and Climate Risks COASTAL ECOSYSTEMS

Stressors	Risks
Increased sea surface temperatures	Increased coral bleaching and collapse of coral reefs from ocean acidification and runoff
Ocean acidification	Loss of reef, seagrass and mangrove habitat, which supports fisheries, reduces coastal erosion and supports water quality
Increased severe weather events; storm surges	Increased coastal flooding and loss of land due to erosion
Sea level rise	Temperature-induced shifts in adult fish distributions and reproduction cycles; decreased fish stocks; loss of livelihoods

Climate Stressors and Climate Risks URBAN INFRASTRUCTURE/SERVICES

Stressors	Risks
Increased temperatures	Damage to urban infrastructure, including roads and bridges
Severe weather events	Damage to water and sanitation facilities, increasing health risks
Sea level rise	Coastal inundation and storm surges, leading to infrastructure damage and forced migration

HUMAN HEALTH

Health risks from endemic vector- and waterborne diseases (i.e., diarrhea, dengue, malaria) are expected to worsen with a changing and more variable climate that includes increased heavy rains and rising temperatures, both of which positively impact mosquito breeding and survival. Although malaria rates dropped dramatically over the last few decades (with 73 percent of the population living in low transmission areas in 2010), dengue epidemics continue to occur every 3–4 years and diarrhea was the fifth most common cause of morbidity in 2010. Observed trends from 1992–2005 show that increases in malaria and dengue are positively correlated with changes in temperature. For example, 2015 (a strong El Niño year) saw a 60 percent increase in dengue compared to 2014. Severe cyclones and rain events increase the frequency of floods and rain-induced landslides, which bring loss of life and livelihoods, crop failure and malnutrition. In 2013, Cyclone Yolande was the most destructive and strongest storm recorded at landfall, affecting 16 million people, displacing 4.1 million, and causing $2.8 billion in damage. (5, 11, 13, 18, 19)

Climate Stressors and Climate Risks HUMAN HEALTH

Stressors	Risks
Increased temperatures	Increased risk of vector- and waterborne diseases such as malaria, dengue and diarrhea
Increased frequency of severe weather events, flooding and landslides	Increased disaster risk to communities and livelihoods, such as loss of life and reduced access to health care systems.
Sea level rise	Increased risk of food insecurity and malnutrition and reduced maternal and child health
	Forced migration and relocation from high-risk areas

POLICY CONTEXT

The Philippines began to mainstream climate change considerations into government policy and planning with the 2009 Climate Change Act, which requires local government units (LGUs) to draft local climate change action plans (LCCAPs). As of July 2016, only 160 of the total 1,700 LGUs had LCCAPs in place.

INSTITUTIONAL FRAMEWORK

The Climate Change Commission (CCC), established by the Republic Act 9729 and the Philippine Climate Change Act of 2009, is the lead policy-making body on climate change concerns. The CCC is tasked to coordinate, monitor and evaluate programs and actions on climate change. The CCC developed the National Framework Strategy on Climate Change (NFSCC) in 2010 to consolidate climate policy across all levels of government and to guide national programs.

NATIONAL STRATEGIES AND PLANS

- The National Climate Change Action Plan (NCCAP) (2011–2028**)**
- Initial National Communication (2000)
- Second National Communication (2014)
- Philippine Development Plan 2011–2016 (2011)
- Establishment of People's Survival Fund (2011)
- LGD Guidebook on LCCAP formation (2014), Book 1 (process guide) and Book 2 (references).

KEY RESOURCES

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18. WHO. 2015. Eliminating Malaria.
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Map Source: Adapted from Center for Environmental Geomatics - Manila Observatory. 2005.

SELECTED ONGOING EXPERIENCES

The table below summarizes recent and ongoing donor-funded programs related to climate change adaptation in the Philippines, excluding those focused on disaster response and rehabilitation from 2013 Cyclone Haiyan (Yolanda).

Selected Program	Amount	Donor	Year	Implementer
Bicol Agri-Water Project (BAWP)	$1.5 million	USAID	2012–2017	University of the Philippines, Los Baños Foundation Inc. and the Philippines Department of Agriculture.
Philippines – Rural Development Project	$507 million	World Bank	2014–2021	Department of Agriculture
Metro Manila Flood Management Project	$3 million	World Bank	2014–2017	Department of Public Works and Highways
Fisheries, Coastal Resources and Livelihood Project (FishCORAL)	$43 million	IFAD	2015–2020	Bureau of Fisheries and Aquatic Resources, Department of Agrarian Reform
150-Megawatt Burgos Wind Farm Project	$20 million	ADB	2014–2015	PPP with EDC Burgos Wind Power Corp, Asian Development Bank, Department of Energy, and the Department of Environment and Natural Resources
National REDD+ system for the Philippines	€ 5.3 million	GIZ	2012 to 2017	Department of Environment and Natural Resources – Forest Management Bureau
Ecosystem-Based Adaptation in marine, Terrestrial and Coastal Regions	$5.84 million	The International Climate Initiative	2011–2015	Conservation International (global program: Brazil, Philippines, South Africa)