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INTERNATIONAL
CORAL REEF INITIATIVE

CASE STUDY 3.

THE REPUBLIC OF THE PHILIPPINES

The case studies form part of the International Coral Reef Initiative's Guidance Document on Integrating Coral Reefs and Associated Ecosystems into National Biodiversity Strategies and Action Plans.

SECTION 1.
INTRODUCTION

The Republic of the Philippines is an archipelago in the Western Pacific Ocean made up of 7,641 islands, of which approximately 2,000 are inhabited. There are three major island groups: Luzon to the north, the central Visayas and Mindanao to the south. The country's territorial waters cover 2.26 million km2 and include 27,000 km2 of coral reefs[1]. The largest 11 islands make up 95% of its land area of approximately 300,000 km2. The Philippines has the fifth-longest coastline measuring 36,289 km, with roughly 60% of the population residing on the coast, where most of its larger cities and population centres are located[2]. The population of just over 118 million is the 13th largest in the world and expected to increase to 180 million in the next sixty years[3]. The country has a highly diverse topography and is located in the region of high seismological activity with most islands of volcanic origin. The Philippines geographical characteristics have contributed to making it one of the most biologically diverse countries in the world[4].

The Philippines has extensive and diverse coastal and nearshore habitats that support an extremely high diversity of species and an estimated 25% of the country's fisheries production[5]. Its coral reefs are the second most extensive in Southeast Asia and contain 600 species of hard coral, with the Sulu Sea ecoregion having the highest diversity of corals globally[6]. The Philippines also supports the highest diversity of marine shore fishes in the world (ref?). The loss of coral reefs has been documented in the country over the last 50 years with average hard coral cover of 22% and no sites remaining with combined coral cover (hard and soft corals) of more than 75%[7].

The Indo-Malay-Philippine archipelago has the highest mangrove diversity in the world with 40 species recorded in the Philippines along with 20-30 species of mangrove associated shrubs and vines[8]. The country has had the some of the fastest rates of mangrove loss with an estimated 30% reduction since 1980[9]. Recent estimates for mangrove cover range between 228,000[10] and 311, 000[11] hectares. About 19% of the remaining mangrove area is in protected area networks, mostly in Palawan and Siargao[12]. There has been extensive mangrove replanting since the 1990's with mixed results. For seagrass beds, 18 species of seagrass have been recorded in the Philippines with the spatial extent of the ecosystem estimated to be between 343 and 635 km2, mainly around Palawan and in the Sulu archipelago[13].

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2- https://worldpopulationreview.com/country-rankings/countries-by-coastline
3- https://worldpopulationreview.com/countries/philippines-population
4- Licuanan, W.Y., Cabreira, R.W., and Aliño, P.F. 2019. The Philippines. Chapter 23. In: World Seas: An Environmental Evaluation, Volume 2. Elsevier Science Publisher.
5- Ibid
6- DeVantier, L. and Turak, E. 2017. Species richness and relative abundance of reef-building corals in the Indo-West Pacific. Diversity 9(3), 25.
7- Licuanan, A.M., Reyez, M.Z., Luzon, K.S. et al. 2017. Initial findings of the nationwide assessment of Philippine coral reefs. Philippine Journal of Science. 146(2): 177-185.
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13- Licuanan, W.Y., Cabreira, R.W., and Aliño, P.F. 2019. The Philippines. Chapter 23. In: World Seas: An Environmental Evaluation, Volume 2. Elsevier Science Publisher.

SECTION 2.

PRESSURES AND IMPACTS ON TROPICAL COASTAL AND MARINE ECOSYSTEMS

The coastal and nearshore ecosystems of the Philippines are affected by a range of stressors that are anthropogenic, natural or climate-related in origin. The geographic location of the Philippines within the Pacific "ring of fire" and the "typhoon belt" make it highly vulnerable to natural disasters such as earthquakes, volcanic eruptions, landslides, flooding and typhoons. Chronic stressors of pollution, sedimentation and overfishing are widespread across the country. Climate change impacts of sea level rise, storm surges, marine heatwaves and typhoons have also been extensively recorded in the Philippines over the last few decades. Large human populations, poor infrastructure and insufficient environmental management mean that the impacts from any of the stressors mentioned are often magnified with some stress combinations acting synergistically.

Climate change is having a major impact on Philippine coral reefs and associated ecosystems. Rising sea levels have led to increased inundation and erosion of wetlands and low-lying coasts and greater potential for damage from storm surge and tsunamis[14]. There was an increase in the number of tropical cyclones in the central Philippines with maximum sustained winds of 150 kph between 1971 and 2000 during ENSO events[15]. Super typhoons such as Haiyan (Cyclone Yolanda) in 2013 have been devastating, causing loss of life, injury, damage to ecosystems and infrastructure and an immense economic toll. This cyclone is estimated to have decreased GDP growth by 0.3 points and increased national poverty incidence by around 2%. Sectors that rely on natural resources such as agriculture, fisheries and forestry are highly susceptible to natural or climate-induced hazards with those employed in them amongst the poorest and at

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highest risk of poverty. In terms of warming, Philippine waters are experiencing a greater rate of temperature increase than other areas in the Coral Triangle with large-scale coral bleaching events reported in 1998, 2010 and 2016. Extended exposure to waters up to 35˚C has also led to fish kills in aquaculture farms and giant clam mortalities in ocean nurseries[16].

The high population density in many parts of the Philippines means that there is immense anthropogenic pressure on natural resources through overexploitation and degradation[17]. Pollution is exacerbated by poor infrastructure and weak implementation of management measures. There are serious issues for both solid waste and wastewater management with a lack of recycling, inadequate disposal (open landfills) and very limited wastewater treatment. Agriculture and industry also substantially contribute to water pollution. Plastic pollution is also a substantial concern for the Philippines with more than half a million tonnes of plastic disposed of into the ocean each year[18].

Fisheries are very important to the Philippine economy, its food supply and its social fabric[19]. Fish accounted for over a third of Filipino's animal protein consumption in 2011[20], about double the global average, with this level likely higher for the poor. Overfishing has been a major pressure on coral reefs and associated ecosystems in the Philippines for decades. There has been a depletion of nearshore fishing grounds and a shift to pelagic fisheries further offshore for some fishers. Others have reverted to destructive fishing practices to try and increase catch levels. Destructive practices such as blast, cyanide and muro-ami fishing are still a problem in the Philippines, enabled by weak enforcement of fishing regulations[21]. Mean catch rates (kg/day) in coral reef areas of the Philippines are among the lowest in the world, reflecting both the overexploitation and destruction of coral reef habitats[22]. In some areas, reef fisheries were found to be so intensive that they were projected to collapse in 16 out of 25 towns studied[23].

16- Licuanan, W.Y., Cabreira, R.W., and Aliño, P.F. 2019. The Philippines. Chapter 23. In: World Seas: An Environmental Evaluation, Volume 2. Elsevier Science Publisher.
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18- Ocean Conservancy. 2015. Stemming the tide: Land-based strategies for a plastic-free ocean.
19- Palomares, M.L.D., Parducho, V.A., Bimbao, M.A. et al. 2014. Philippine marine fisheries 101. In: M.L.D. Palomares and D. Pauly. (Eds.). Philippine marine fisheries catches: a bottom-up reconstruction, 1950 to 2010. Fisheries Research Centre Report 22 (1): 1-13. Vancouver: Fisheries Centre, University of British Columbia.
20- FAO (Food and Agriculture Organisation of the United Nations). 2014. Fishery and aquaculture country profiles: The Republic of the Philippines.
21- Tahiluddin, A.B., and Sarri, J.H. 2022. An overview of destructive fishing in the Philippines. Acta Natura et Scienta 3: 116-125. https://doi.org/10.29329/actanatsci.2022.352.04
22- Aliño, P.M., Naňola, C.L. Jr., Campos, W.L. et al. 2004. Philippine coral reef fisheries: diversity in adversity. In G. Silvestre et al. (Eds.). In turbulent seas; The status of Philippine marine fisheries (pp. 65-69). Cebu City: Department of Agriculture-Bureau of Fisheries and Aquatic Resources.
23- Muallil, R.N., Mamauag, S.S., Cabral, R.B., et al. 2014. Status, trends and challenges in the sustainability of small-scale fisheries in the Philippines: insights from FISHDA (fishing industries' support in handling decisions application) model. Marine Policy 44: 212-221.

SECTION 3.

PRIMARY TYPE OF CORAL REEF (OR ASSOCIATED ECOSYSTEM) INTEGRATION

Theme: REDUCING DIRECT PRESSURES AND PROMOTING SUSTAINABLE USE

The third and current version of the NBSAP for the Philippines was published in 2016 and covers thirteen years between 2015 and 2028[24]. The Philippines Biodiversity and Strategic Action Plan (PBSAP) is specifically designed to address and reduce the five major pressures of biodiversity loss as defined by IPBES through a combination of direct and enabling interventions. The three primary direct interventions are: i. restoration of ecosystem functions; ii. promotion of biodiversity-friendly livelihoods; and iii. strengthening law enforcement. Enabling interventions to support direct ones are: i. communication, education and public awareness (CEPA); ii. capacity development for biodiversity management; iii. biodiversity conservation-related research; iv. strengthening policy for biodiversity conservation; v. promotion of biodiversity-friendly technology; and vi. resource mobilisation.

The PBSAP includes twenty conservation targets to be achieved by 2028 with indicators identified for each one. Coral reefs and associated ecosystems are well represented within the targets, both directly and indirectly. Specific conservation targets that are closely linked to coral reefs and associated ecosystems are:

- **Target 1.** The conservation status of nationally and globally threatened species in the country from 2016 is maintained or improved.
- **Target 3. There will be no net loss in presence and area distribution of live coral cover, mangroves and seagrasses.**
- **Target 8.** Fish stocks of economically important species will be maintained.
- **Target 10.** The key threats to biodiversity will be reduced, controlled or managed.
- **Target 12.** Capacity for biodiversity conservation if public and private sector groups in terrestrial and marine PAs / KBAs is strengthened.
- **Target 14.** One million hectares of degraded ecosystems will be restored and/or will be under various stages of restoration.
- **Target 20.** There will be a 20% increase from 2015 levels in the coverage of established MPAS/ sanctuaries across various aquatic habitats.

In particular, there is a conservation target specifically for coral reefs and associated ecosystems **(Conservation Target 3)** to ensure that the spatial coverage of these ecosystems is maintained.

Further details for the direct and enabling program interventions for marine and coastal ecosystems are provided in Annex 5 of the PBSAP. These are arranged under the following subject headings: habitat loss, overexploitation, pollution, and climate change. Interventions for each of these main topics are listed with targets and indicators designated for each intervention. The entities responsible for each

24- Biodiversity Management Bureau (BMB) Department of Environment and Natural Resources (DENR). 2016. Philippines Biodiversity Strategy and Action Plan (2015-2028): Bringing Resilience to Filipino Communities. C. Cabrido (Ed.). Quezon City, Philippines: BMB-DENR, United Nations Development Programme – Global Environment Facility, Foundation for the Philippine Environment.

intervention are clearly identified, including the lead entity, and the cost of completing the intervention is also estimated. Coral reefs, mangroves and seagrass beds are all specifically mentioned in multiple targets to achieve the direct program intervention of "restoration of ecosystem functions" to address habitat loss. Throughout the PBSAP there is strong emphasis on, and support for, protected areas and restoration.

Enabling interventions focussed on communication, awareness and public engagement also feature strongly for marine and coastal ecosystems in the PBSAP as well as capacity development to fund and implement action plans for stakeholders at the local level. Mainstreaming (marine and coastal) biodiversity conservation into national and local planning processes is specifically mentioned with targets linked to requiring local government units to incorporate integrated coastal management into their plans and frameworks.

Within the main topic of overexploitation for marine and coastal ecosystems there is emphasis on addressing the causes of biodiversity loss through the promotion of biodiversity-friendly livelihoods for people who depend on fisheries for income. Diversifying the incomes of coastal communities will reduce fisheries-related impacts on coral reefs and associated ecosystems. This intervention aims to develop and implement marine and coastal biodiversity-friendly livelihoods such as community-based ecotourism. Delivery of communication materials and trainings on the sustainable (biodiversity-friendly) use of coastal and marine resources also feature for stakeholders and local communities.

Overall, the Philippines NBSAP (PBSAP) provides a highly useful example of how coral reefs and associated ecosystems can be successfully integrated into national plans and strategies for biodiversity. Integration is found at multiple points with all of the key pressures on marine and coastal ecosystems addressed within the document.

The case study was developed in collaboration with the country represented and existing information for the purpose of the International Coral Reef Initiative's Guidance Document on Integrating Coral Reefs and Associated Ecosystems into National Biodiversity Strategies and Action Plans.

Download the full guidance document: https://icriforum.org/documents/icri-coral-reefs-nbsaps/

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