# Typhoon Risk Insurance for Marine Protected Areas in the Philippines A Pre-feasibility Study

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## Acronyms

ACliFF	Asia Pacific Climate Finance Fund		Development Coordinator		
ADB	Asian Development Bank	МТО	Municipal Treasury Office		
AICS	Assistance to Individuals	NbS	Nature Based Solutions		
	in Crisis Situation	NGO	Non-governmental Organization		
BCE	Blue Carbon Ecosystem	NIPAS	National Integrated		
BFAR	Bureau of Fisheries and		Protected Areas System		
D1 (D	Aquatic Resources	NTA	National Tax Allotment		
ВМВ	Biodiversity Management Bureau	OPA	Office of the Provincial Agriculture		
DENR	Department of Environment and Natural Resources	PA	Protected Area		
DIMRS	Danjugan Island Marine Reserve and Sanctuaries	PAGASA	Philippine Atmospheric Geophysical and Astronomical		
DRR	Disaster Risk Reduction	DAMD	Destroited Arra Management David		
DRRMO	Disaster Risk Reduction and	PAMB	Protected Area Management Board		
	Management Office	PAMO	Protected Area Management Office		
DSWD	Department of Social Welfare	PCG	Philippine Coast Guard		
	and Development	PCIC	Philippine Crop Insurance Corporation		
EUF	Environmental User Fee	PDRRMO	Provincial Disaster Risk Reduction		
E4DR	Strengthening Disaster Resilience and	1210010	Management Office		
	Risk Mitigation through Ecosystem- based Planning and Adaptation	PENCAS	Philippine Ecosystem and Natural Capital Accounting System		
FGD	Focus Group Discussion	PGENRO	Provincial Government Environment		
FMRD	Fisheries Resources		and Natural Resources Office		
	Management Division	PIRA	Philippine Insurers and		
GIZ	Deutsche Gesellschaft für Internationale		Reinsurers Association		
	Zusammenarbeit GmbH	PPDO	Provincial Planning and		
GSIS	Government Service Insurance System		Development Office		
ICM	Integrated Coastal Management	PRRCFI	Philippine Reet and Rainforest Conservation Foundation, Inc.		
IEC	Information, Education	РТО	Provincial Tourism Office		
	and Communication	RA	Republic Act		
IPAF	Integrated Protected Area Fund	RISCO	Restoration Insurance		
IRA	Internal Revenue Allotment	Ribbo	Service Company		
KII	Key Informant Interviews	SAPA	Special-use Agreement		
LGU	Local Government Unit		in Protected Areas		
MAO	Municipal Agricultural Office	SMA	Special Management Areas		
MDRRMO	Municipal Disaster Risk Reduction and Management Office	SOMACORE	Solutions for Marine and Coastal Resilience in the Coral Triangle		
MENRO	Municipal Environment and	TNC	The Nature Conservancy		
	Natural Resources Office	VIP	Verde Island Passage		
MFARMC	Municipal Fisheries and Aquatic Resource Management Council				
MPA	Marine Protected Area				
MPDC	Municipal Planning and				

# 1 Executive summary

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The Philippines is host to more than 1800 Marine Protected Areas (MPAs) and is committed to significantly expand their number and size under the 30 x 30 framework. These MPAs face an increasing threat from multiple hazards, most notably typhoons, which can severely damage mangroves, coral reefs and seagrass meadows. Already chronically underfunded, many MPA management councils struggle to replace lost monitoring assets and finance rehabilitation work. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) commissioned this pre-feasibility study in order to analyse the potential of new insurance solutions to assist MPAs bouncing back quickly in the aftermath of typhoon events.

Based on a brief literature review, four study sites were selected together with GIZ: Mabini/Batangas, Danjugan/Negros Occidental, Biri LaRoSa/Northern Samar and Hinunangan/ Southern Leyte. At each of the four sites, numerous discussions with a diverse range of stakeholders were held in order to collect data, understand their constraints, aspirations and views on ecosystem services provided by the MPAs, as well as threats through typhoons or other hazards. The concept of dedicated "MPA insurance" was introduced in order to understand stakeholders' perception on its feasibility and impact on conservation outcomes.

Encouragingly, all MPA managers visited are open to and interested in exploring how insurance could be integrated into their financing strategies. From the discussions, three focus areas for future product development have emerged: i) MPA monitoring and enforcement assets, such as demarcation buoys, patrol boats and watch towers; ii) business interruption for fisherfolks when they are unable to go to sea due to restrictions imposed by the Philippine Coast Guard; and iii) clean-up and rehabilitation efforts for damaged mangroves.

Unlike Mexico, where coral reef insurance is being piloted since 2018, financing active reef restoration after hurricane damage, the Philippines do not engage in active reef restoration as a postdisaster recovery measure. Therefore, replicating the Mexican experience is not an immediate option. More broadly, our research has found that illegal fishing activities pose a chronic threat to marine wildlife even within the MPAs and that other hazards such as earthquakes, volcanic eruptions and marine heatwaves are considered as secondary or equally important events by MPA managers, while fisherfolks also regularly suffer from freshwater flooding. Many MPAs appear underfunded and their activities are sometimes hampered by overly bureaucratic procedures or interference by local politicians.

We recommend to select interested MPAs where all stakeholders are aligned and engage them on a broad capacity building basis, aimed at strengthening their management processes and establishing robust financing plans where insurance solutions can be integrated. Regarding insurance product development, initial efforts should centre around protecting MPA management and enforcement assets, mangrove rehabilitation and assisting fisherfolks in times of hardship.

At a later stage and in order to scale up MPA insurance, dedicated trust funds at provincial or national level are likely the best option to reach and manage the multitude of potential MPA clients, giving the insurance partner the required diversification and scale, while offering MPAs a platform and suite of products to choose from.

Protecting, strengthening and expanding Philippine MPAs is of international importance and will only be possible if adequate funding is secured and existing protection laws are enforced. Insurance solutions should be integrated into comprehensive financing plans and complement other financial tools such as contingent credit lines and restoration funds. The Philippine insurance industry is well equipped to raise to this challenge.

# 2 Motivation and context



In the face of the twin crisis of climate breakdown and accelerated biodiversity loss, the importance of Nature-based Solutions (NbS) is widely acknowledged and is gaining increased attention. Today, only a third of the investments required to reach climate, biodiversity and land degradation targets by 2030 flow towards NbS: USD 200 billion annually, out of which only 18 per cent come from the private sector (UNEP 2023). GIZ has identified substantial private sector interest in investment opportunities in NbS under the condition of clear business cases – a condition rarely obvious at the initial stages of a project.

This report summarises the results of a pre-feasibility study commissioned by GIZ and implemented by GOPA AFC over the course of February to September 2024. The study explores the potential of insurance instruments to support MPAs in the Philippines becoming more resilient towards typhoon risks, a major hazard in the country. Insurance solutions – as one tool in a range of financial mechanisms – could potentially accelerate the mobilisation of investments required for protecting ecosystems, as well as securing the local communities directly depending on the services these ecosystems provide.

The Republic of the Philippines offers an interesting case to study this approach. It is part of the Coral Triangle, hosts marine biodiversity hotspots of international importance, boasts over 1800 MPAs and is visited by over 20 typhoons in an average year. The country is home to a diverse and vibrant insurance industry which has created numerous innovations in the area of inclusive, as well as climate risk insurance. Furthermore, the Government of the Philippines is committed to significantly expand MPAs under the 30 x 30 framework.<sup>1</sup>

## 2.1 Marine protected areas

An MPA is a "generic term for a defined area of the sea established and set aside by law, administrative regulation, or any other effective means, in order to conserve and protect a part of or the entire enclosed environment, through the establishment of management guidelines" (White et al., 2014). Furthermore, MPAs can, but don't have to include coastal zones, especially mangroves, as well as substantial land areas. Therefore, MPAs come in a wide variety of forms and shapes: they vary greatly in total area protected, in ecosystems services provided, in the species living in and depending on them as well as in the economic value to local communities, be it through their attractiveness for (eco-) tourists, sustainable fishing and/or their capacity to reduce the impact of natural disasters to name but a few.

While MPAs are primarily set up to create a safe space for marine wildlife and hence protect marine biodiversity as well as sustainable fisheries, they often contribute to disaster risk reduction (DRR) for coastal communities. Mangroves play a critical role in absorbing wave energy, protecting the shoreline and greatly reducing coastal erosion. Coral reefs, in turn, can equally protect the coast by breaking waves during typhoon events. Finally, mangroves and seagrass fields are efficient carbon sinks, naturally sequestering CO2 from the air. Almost all of these critically important ecosystem services are positive externalities and thus typically undervalued in monetary terms.

## 2.2 Typhoons in the Philippines

Tropical cyclones within the North-western Pacific Basin are referred to as typhoons. In the Philippines, typhoons can occur throughout the year, though the peak season is July through October, when 70% of all typhoons develop<sup>2</sup>. Per year, an average of 20 typhoons enter the Philippine Area of Responsibility, out of which 8 to 9 cross the Philippines.

The Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) has developed its own system to categorise typhoons and does not use the Saffir-Simpson scale used to classify hurricanes in the North Atlantic. Wind signal categories are used for forecasts and warning bulletins, while the measured wind speeds inform the ultimate, locationspecific typhoon classification. This classification system has been modified several times over the past decades, as illustrated by *Figure 1*, with the latest change implemented as recently as March 2022. This is important when discussing with community members, who regularly refer to the previous classification system.

# 2.3 Parametric insurance approaches

Parametric or index-based insurance refers to design approaches where insurance pay-outs are based on an objective variable (the index) that is closely linked to expected damages, but not the losses itself. Examples for indices used include rainfall, temperature and wind speeds, but also earthquake magnitudes and floodwater levels, which correlate with agricultural losses and damage to assets and infrastructure.

Unlike traditional insurance (also referred to as indemnitybased), which requires client-specific exposure assessments and post-disaster loss adjustments, parametric insurance can be pre-packaged and sold to clients within the same exposure zone without individual verification. Crucially, parametric insurance determines any claim pay-outs within a very short time once the index data are available, speeding up claims settlement significantly compared to processes relying on on-site

<sup>1 &</sup>lt;u>https://denr.gov.ph/news-events/denr-leads-ph-initiatives-to-meet-30x30-global-climate-change-pledge/</u>

<sup>2 &</sup>lt;u>https://www.pagasa.dost.gov.ph/climate/tropical-cyclone-information</u>

inspections. However, parametric insurance comes with its own set of challenges and drawbacks. First, establishing a very good correlation between an objective variable and individual losses on the ground is often difficult, leading to what is known in the industry as basis risk, i.e. a deviation between individual loss experience and what the insurance product pays. Second, explaining how such products work to low-income customers typically requires significant efforts, especially when the index combines multiple data sources, some of which may be satellitebased. Finally, parametric insurance can only be improved over time when regular post-disaster loss assessments are performed in order to better calibrate the index – an effort which negates some of the cost advantages.

Parametric insurance approaches have an overall advantage over traditional insurance products in situations where:

 Hazard and loss data allow for establishing a good correlation between the variable(s) measured and losses on the ground, implying a low basis risk

- Speed in settling claims after a loss event is paramount, allowing clients to bounce back faster and avoiding negative secondary impacts of a disaster (e.g. taking children out of school, selling productive assets, borrowing money at excessive interest rates etc.)
- Individual loss assessments are too costly to perform and/or virtually impossible (e.g. numerous clients with low insured values in remote areas)

Indemnity-based insurance products, on the other hand, allow for client-specific contracts, reflecting the individual exposure and unique circumstances, where this is warranted. They also provide much higher certainty for the client to receive a pay-out in line with the losses sustained. Where such loss-assessments are straightforward and/or done in any case, traditional insurance is likely the preferred approach.

Figure 1. PAGASA Tropical Cyclone Classification



# 2.4 International examples of MPA insurance

Efforts to integrate insurance solutions into the financing strategy of protected ecosystems have emerged during the last decade. The growing, positive experience with parametric insurance products has clearly motivated various stakeholders, most notably (re) insurance companies and international Non-Governmental Organizations (NGOs) dedicated to nature and biodiversity conservation, to explore ways to create and use such products to the benefit of nature and society. However, today only a few practical examples of insurance products covering MPAs exist.

Being a financial service, insurance cannot protect ecosystems from destruction but typically provides liquidity after a loss event. This quick access to funds allows ecosystem management bodies to rapidly engage in clean-up and stabilisation activities, especially important when active reef restoration is practised. "Addressing the damage quickly and effectively is critical to reducing damage to affected corals and for increasing the likelihood that reefs will continue to provide valuable services to local communities in the future." (TNC & ADB, 2023).

The probably first insurance product covering a coral reef with the stated intention of providing liquidity for rapid clean-up and restoration efforts after a hurricane was launched in 2018 in Mexico, covering the Quintana Roo reef (GIZ, 2023). This pioneering work has directly led to the creation and implementation of a much larger scheme, covering various sites within the Meso-American Reef since 2020 (MAR Fund News, 2020), as well as an insurance solution covering Hawaii's coral reefs (WTW, 2022). Furthermore, the same principles were applied to cover an important, actively managed mangrove site in San Crisanto, Mexico (AXA Climate, 2023). In these cases, the successful implementation and continued renewals hinge on a couple of important factors, including:

- Strong local teams managing conservation efforts and trained to undertake active reef and mangrove restoration post-disaster
- Significant support from government agencies, dedicated international NGOs and (re)insurance companies, including technical expertise and funds to cover premium costs

Such pilot projects have clearly contributed to raise awareness for the potential benefits insurance can bring to conservation efforts and financing restoration of damaged ecosystems. The Nature Conservancy (TNC) and Asian Development Bank (ADB) discuss the preconditions for successfully designing and operating insurance schemes covering coral reefs in the recent publication "Sustainable finance for Asia and the Pacific protecting and restoring coral reefs" (TNC and ADB, 2023). They argue that coral reef insurance should only be purchased once MPA management already have sufficient post-disaster response capacity, as "addressing the damage quickly and effectively is critical to reducing damage to affected corals and for increasing the likelihood that reefs will continue to provide valuable services to local communities in the future." This is particularly true when active reef restoration (see Box 1 for more details) is considered, a practise not common in the Philippines, and the same paper states that "ultimately, insurance policy pay-outs will only be effective if they are managed within a clear institutional structure and if stakeholders have access to the technical and human capacities, the equipment, and the resources needed to respond after a tropical storm. To make sure this institutional structure is in place, a concerted effort around capacity building may be needed prior to purchase of a coral reef insurance policy."

#### Box 1. Active and Passive Reef Restoration

There are two approaches to reef rehabilitation/restoration: active and passive. Passive restoration relies on natural processes to regenerate damaged reefs, focusing on protection measures to prevent further stress from poaching and other human-induced pressures. This approach is costeffective but requires robust delineation and monitoring. It also takes decades or centuries to allow corals to grow back to its massive and complex structures, which provide shelter and sustenance to various flora and fauna species within a reef ecosystem based on the works of Öhman (1998).

In contrast, active restoration involves human intervention to accelerate ecosystem recovery, such as stabilizing substrates with artificial reefs and using coral nurseries to propagate rescued corals. This method is much more expensive than the passive approach, as it is labour-intensive and requires specialized skills and equipment. Its proponents claim that active reef restoration leads to much faster recovery of severely damaged reefs. However, there is hardly any scientific review proving the success of large reef restoration projects over time. In addition, costs for active reef restoration at scale are prohibitive and scarce resources are arguably better used for improved protection.

In the Philippines, the absence of clear policy guidance on active reef restoration poses challenges for those interested in active restoration. As a result, projects often come under the guise of scientific research, but grapple with lengthy permit processes, delaying implementation for up to six months.

More generally, active reef restoration, its potential and limits remain a hotly debated topic. While it makes for good headlines, some conservation scientists point to its significant costs, unproven claims and very limited scale of actively restored coral reefs and argue that active reef restoration should not divert attention from much more meaningful protection efforts of existing reefs and efforts to limit and ultimately revert climate change (Boström-Einarsson L, et al, 2020).

ADB has commissioned fundamental position papers on the nexus between insurance and coral reef restoration in order to broaden the debate and provide guidance on where to focus next (TNC & ADB, 2023). Coral reefs and mangroves provide a large variety of ecosystem services, and their protection is not only important from a conservation perspective, but also because they often function as an effective DRR measure against typhoons, storm surge, coastal erosion etc. However, ADB also notes that "Unfortunately, the disaster risk reduction services provided by Marine Coastal Ecosystems are rarely quantified and taken into account in the management of coastal disaster risk." (ADB, 2022). In consequence, ADB argues that MPA insurance schemes should be part of a comprehensive risk management approach and help owners of action to recognise the monetary value of ecosystem services offered in order to motivate them buying insurance provided they dispose of sufficient financial resources to do so.

A different aspect of the discussion around insurance and MPA ecosystem services centres around the question how an MPA's role in DRR could be monetised through lower insurance premiums for coastal properties. The report "Insurance Underwriting with Nature" (Earth Security, 2022) notes that while the risk reduction through mangroves and coral reefs are widely acknowledged and conceptually well understood, there are few reliable data sets and most underwriting models used by insurance companies are currently not taking such factors into account. This clearly complicates the task of building a business case around such products, as hazard attenuation through intact ecosystems is one way to demonstrate their financial value.

In summary, coral reef and mangrove insurance that finances post-disaster recovery currently exists in a few places and exclusively where active ecosystem restoration is already practised, backed by sufficient funding and part of a comprehensive risk management approach. As stated above, these products are currently almost exclusively (part-)financed by large NGOs or private sector sponsors as a contribution to conservation efforts. A pure business sector driven set-up has yet to emerge.

### 2.5 Study assignment

The overarching goal of this pre-feasibility study was to prepare the ground for future insurance product development and pilot testing activities. To that end, the initial Terms of Reference included five tasks to be performed:

- Identification of MPAs that hold great potential for the development and implementation of insurance providing protection against typhoon-related losses. This includes an analysis of key stakeholders, values and services at risk such as physical assets, ecosystem assets and services, as well as disruptions and related loss of income for sectors directly depending on a functioning ecosystem such as fisheries and tourism. A high-level assessment of stakeholders' ability and willingness to pay for insurance services is part of this analysis.
- Identification of assets to be covered through a potential insurance scheme and the collection of key data for the selected MPAs: value of ecosystem services, impact of interruptions in those services and historical damages through cyclones.
- **3.** Detailed analysis of current and potential key income sources for each of the selected MPAs. This should ideally include eco-tourism in detail and fishery, carbon credits, disaster risk reduction management fund of LGUs, etc. roughly.
- 4. Analysis of potential policyholders for the insurance scheme, e.g., institutions/NGOs, government line agencies, LGUs, etc. that are managing the selected MPAs and face a financial loss in case of a cyclone hitting the MPAs. This analysis includes investigating the effectiveness and efficiency of the management and its ability to quickly respond and act after a cyclone. Furthermore, this component includes a rough analysis whether the establishment of a trust fund covering several MPAs would be recommendable and feasible and if yes, outline recommendations for the next steps for its establishment.
- 5. Formulation of recommendations concerning next steps for the MPAs, the Insurance Commission, PIRA, the Government Service Insurance System and GIZ.

# 3 MPAs and ecosystem insurance in the Philippines

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# 3.1 Marine protected areas in the Philippines

In the Philippines, MPAs can be grouped into two classes: locally managed MPAs, created through a municipal ordinance, and nationally managed MPAs, established under the National Integrated Protected Areas System (NIPAS) as stipulated in Republic Act (RA) 7586. NIPAS sites are managed by the national government through the Department of Environment and Natural Resources (DENR) in partnership with local stakeholders. The vast majority of MPAs in the Philippines fall under the class of locally managed ones, as can be seen in Figure 2. Cabral et al. (2014) presented a database that contained in total 1800 MPAs at the time, covering about 240 km<sup>2</sup>, implying an average size of 0.13 km<sup>2</sup>. Unfortunately, this database suffered the same fate as the authors noted about previous attempts to establish a reliable register: it became a static repository with limited or interrupted access. As a consequence, today there is no reliable database with up-to-date information on MPAs in the Philippines. There is a widespread perception that a large majority of these MPAs are severely underfunded and poorly managed, as summarized by Leilani Chavez (2021).

There are 43 nationally managed MPAs, covering about 1.3 million ha, according to the expanded NIPAS Act (RA 11038).

The Philippines is situated within the Coral Triangle region, which is a major hotspot for coral reef biodiversity (Roberts et al.,

2002; Halpern et al., 2008; Burke et al., 2012). The Philippines has the highest concentration of fish species per unit area and is considered as the global « Centre of the Centre » of marine shorefish diversity (Carpenter and Springer, 2005). The establishment of MPAs has been among the major initiatives for coral reef conservation and fisheries management in the Philippines (Russ, 2002; White et al., 2014). Their number and size are set to increase significantly under the Philippines' commitment to the 30 x 30 framework.

### 3.1.1 Locally managed

Locally managed MPAs in the Philippines are significant examples of community-based conservation efforts. These MPAs are typically managed by local communities or fisherfolk organizations, often in collaboration with government agencies and NGOs. These locally managed MPAs are established through local ordinances anchored on RA 8550 or the Fisheries Code of 1998 (as amended by RA 10654) and the Local Government Code of the Philippines (RA 7160), giving authority to Local Government Units (LGUs) to manage their coastal and fishery resources in close coordination with national government agencies.

One of the defining features of locally managed MPAs is the active involvement of local communities in their establishment, management, and enforcement. This participatory approach empowers communities to take ownership of marine resource management, ensuring that decisions align with their cultural, economic, and environmental priorities.

Figure 2. Overview map of MPAs in the Philippines



Source: https://mpadatabase.netlify.app/

While proponents of locally managed MPAs consider them as one of the most effective tools for managing coastal resources (White et al., 2002), these often small MPAs also face challenges such as limited funding, management and enforcement gaps, and recurring issues of unsustainable practices as well as various impacts linked to the changing climate. Nevertheless, success factors such as strong community leadership, effective governance structures, supportive policies, and partnerships with government agencies and NGOs have sustained effective MPAs all over the Philippines.

### 3.1.2 Nationally protected

MPAs that are established by national laws are designed to conserve and manage the country's biodiversity and natural resources. These large MPAs aim to protect and preserve areas of global, national, or local significance due to their ecological, biological, cultural, and socio-economic values. Its primary objectives include conserving biological diversity, ensuring sustainable development, and promoting environmental awareness among Filipinos. Most of the nationally managed MPAs are incorporated in RA No. 7586, the NIPAS Act of 1992 (as amended and expanded by RA 11038 in 2018, leading to e-NIPAS) or a completely separate national legislation (e.g. R.A. 10067 Tubbataha Reef Natural Reef Act). NIPAS represents the Philippines' commitment to biodiversity conservation and sustainable development through the establishment and management of a comprehensive network of protected areas. It plays a crucial role in safeguarding the country's natural heritage for future generations while promoting the harmonious coexistence of people and nature.

The NIPAS Act mandates the DENR as the lead agency responsible for administering and managing protected areas under the system. Management plans and programs for each protected area are developed in consultation with local communities, stakeholders, and other government agencies to ensure effective conservation and sustainable use.

Despite its framework, the NIPAS faces challenges such as inadequate funding, illegal activities within protected areas, conflicting land uses, and climate change impacts. Efforts to strengthen enforcement, enhance community participation, and promote sustainable livelihoods within protected areas are ongoing to address these challenges.

# 3.2 Insurance solutions for ecosystem protection

The study team has identified several projects and studies related to insurance and MPAs in the Philippines, which are briefly discussed here. Unless otherwise stated, the information was collected through personal communications and cannot be backed up with publicly available reports.

- **RISCO:** The Restoration Insurance Service Company (RISCO) was set up with the state goal to be "A first-of-its kind social enterprise that conserves and restores mangrove forests by generating insurance-related revenue through property damage risk reduction and blue carbon revenue through the sale of credits." (The Lab, 2020). RISCO sought to monetise the risk reduction value of existing mangroves by incorporating them as an attenuating factor in insurer's underwriting models. The underlying assumption appears to be that coastal property owners close to mangroves are i) buying property insurance and ii) are prepared to pay a premium for nature-positive insurance and iii) are willing to co-finance mangrove protection in anticipation of increased insurance premiums should mangroves disappear. In addition, blue carbon credits generated through mangrove restoration and conservation were expected to contribute significantly to RISCO's revenue stream. Over the years since, RISCO's business model has evolved: it now concentrates on mangrove-positive community businesses by offering low-interest credits and technical training to coastal community members who set up such businesses, as well as the generation of blue carbon credits. Any profit generated through these activities are channelled towards mangrove conservation. The sale of insurance has diminished in importance, also because RISCO has found some government entities challenging to work with on insurance transactions.
- ADB/Swiss Re: With funding from the Asia Pacific Climate Finance Fund (ACliFF), ADB collaborates with Swiss Re since late 2022 on a pilot project to insure coral reefs in four countries: the Philippines, Indonesia, the Solomon Islands and Fiji. So far, the project has focused on coral reefs only, but recognised that mangroves should be considered, too. It is unclear when a product will be tested and what a potential pay-out would be used for, however.
- BFAR/Rare/PCIC: This consortium is currently developing a parametric insurance product with the intention to protect fisherfolks from hardship during prolonged periods of rough sea. Reportedly, the underlying index combines wind speed, wave height and rainfall data. At the time of speaking to them, no definitive date for launching the product has been set.
- Blue Alliance/AXA: Since 2023, Blue Alliance (former Blue Finance) is testing a parametric insurance product covering selected MPAs, including the MPA network of North Oriental Mindoro in the Philippines. The premium is sponsored by the Howden Group for at least the first year and pay-outs will go to Blue Alliance, which in turn will use them to finance clean-up and rehabilitation work (source: https://climate.axa/marine-protected-areas-blue-finance/).

In summary, there are quite some insurance projects involving MPAs and coastal communities in the pipeline. Private Philippine insurance companies are not yet actively involved.

# 3.3 National ecosystem value accounting

The recent enactment of RA 11995, the "Philippine Ecosystem and Natural Capital Accounting System (PENCAS) Act," represents a significant advancement in the nation's conservation efforts. This policy will enhance and expedite the inventory and valuation of natural resources from ridge to reef, providing a comprehensive assessment of the country's ecosystems. By accurately determining the extent of these resources, the Act will facilitate the development of sustainable financing mechanisms, such as Blue Carbon Ecosystem (BCE) credits for mangroves, seagrass, and marshlands, and the issuance of Blue Bonds by financial institutions. Nationwide natural resource accounting will establish a foundation for the monetary valuation of assets, aiding in the calculation of credits, damage assessments, indemnity, as well as for insurance purposes.

This natural accounting initiative may significantly boost the protection and restoration of BCEs, improving their capacity to sequester carbon dioxide and augment biodiversity inventories. However, these ecosystems are vulnerable to natural hazards, threatening conservation efforts by local governments, NGOs, and community stakeholders. As mentioned above, ecosystem insurance could provide crucial financial protection against such risks. In the event of a calamity, it enables stakeholders to quickly access funds for restoring damaged BCEs and expanding restoration sites, thereby increasing habitat extent in a timely manner. Insurance can also protect BCE carbon credit projects against a shortfall of carbon credits in the wake of natural catastrophes, e.g. a typhoon destroying a mangrove forest. Revenue from trading blue carbon credits in the voluntary market can be used to pay insurance premiums, supporting both business interruption and ecosystem insurance policies, as well as covering maintenance and personnel expenses for protected zones.

Biodiversity credits, although in their early stages, hold promise as a future revenue stream based on the quality of biodiversity. They incentivize the protection and maintenance of protected areas. Ecosystem insurance can mitigate financial shocks following natural calamities and support the rehabilitation of damaged ecosystems. This approach ensures sustainable financing for conservation efforts, promoting resilience and long-term environmental and economic benefits. However, the market for biodiversity credits is in its infancy only at a global level and prospects to soon tap into it for substantial revenue generation are slim.



# 4 Methodology



A stock-taking exercise was conducted to assess the current status of insurance products for biodiversity preservation, with a focus on MPA insurance. Key informant interviews (KIIs) and focus group discussions (FGDs) were employed to efficiently gather strategic information from various stakeholders. The interviews and discussions aimed to understand stakeholder vulnerability to natural disasters, especially typhoons, human-induced calamities, their coping mechanisms, and existing support systems. KIIs aimed at uncovering historic loss data as well as the MPA's funding structure and management practises. Additionally, questions explored the potential role of insurance in supporting coastal conservation efforts as a sustainable financial mechanism for enhancing resilience and recovery.

### 4.1 Theory of change

At the outset of the study, the following three theories of change were developed in order to guide our research and kick-off discussions with various stakeholders. They all centre around insurance against typhoon risks and describe in broad terms who or what could be insured and what the intended benefits would be. What changes is the focus or perspective: MPA management assets; marine habitat; or local communities are at the core of insurance services:

- MPA management assets: "Thanks to MPA insurance, critical infrastructure to monitor and manage MPAs can be quickly replaced or repaired after a typhoon event. Therefore, MPA management can resume its duties soon after having lost surveillance equipment." Assets to insure could include patrol boats, demarcation buoys, watchtowers, piers and MPA management offices. The target group would be the respective MPA management body, who would be the policy holder and beneficiary of any insurance pay-out. The rationale here is that insurance pay-outs allow for rapid asset replacement, which in turn permits them to resume monitoring MPA sites soon after a typhoon event. This may lead to better protection outcomes.
- Habitat insurance: "Thanks to MPA insurance, the core habitat of MPAs can be (partially) restored after a typhoon struck. Insurance pay-outs will be used to create enabling conditions for ecosystems to recover after destruction and hence resume their ecosystem services." Key habitats to insure include coral reefs, mangroves and seagrass meadows. The target group for this type of insurance is relatively broad and could include the respective MPA management body, but also third-party interest groups such as NGOs who want to support ecosystem conservation and restoration. The rationale here is that insurance pay-outs allow for rapid clean-up and reconstruction of damaged habitats. Emergency measures help to prevent further deterioration after destructive typhoon events.

**Community insurance:** "Thanks to MPA insurance, the local community gets financial support after a typhoon event. This will partially compensate for lost income and may also finance clean-up and restoration work". Key community groups to potentially insure include fisherfolks, tour operators, boatsmen, as well as hotel and restaurant owners and their staff. The target group here are those communities that directly benefit from MPA ecosystem services, but also directly suffer from disruptions after typhoon-events. The rationale is that insurance compensates for lost income, will pay for some clean-up and restoration work done by the community and may contribute to limit consequential losses or additional damage.

Interestingly, all three theories of change have been found to be more or less plausible during our research. While the first and the third immediately made sense to all stakeholders exposed to them, the second – initially thought to be at the core of the concept of MPA insurance – required the most explanations. This may be due to the fact that currently active reef restoration is not widely practised in the Philippines (see Box 1) and mangroves are restored if and when resources allow it.

## 4.2 Site selection

In order to structure the selection criteria, the study team developed a mind-map shown in Annex 1, which helped populate a detailed table of shortlisted MPAs to compare the various candidates for inclusion in the study. While some of the information required to select a diverse sample is readily available, other aspects could only be assessed during the study itself. In the end, a combination of the following factors influenced the selection:

- Variety in terms of governance structure (NIPAS, LGU-MPA, private foundation MPA)
- Variety in terms of ecosystem services, local economic activities and exposure to typhoon
- Geographic location within the Philippine waters of the Sulu-Sulawesi Seascape, a priority area of the Solutions for Marine and Coastal Resilience in the Coral Triangle (SOMACORE) Programme and the GIZ project areas of Strengthening Disaster Resilience and Risk Mitigation through Ecosystem-based Planning and Adaptation (E4DR)
- Established contacts between GIZ and the respective MPA management bodies
- Logistical considerations

Ultimately, GIZ and the study team jointly selected four sites encompassing contrasting typhoon exposure and management models: Northern Samar and Southern Leyte, located on the typhoon-prone eastern seaboard, are part of the ongoing GIZ project E4DR, which focuses on ecosystem-based adaptation and climate resilience. Batangas and Negros Occidental sites are located within the Sulu-Sulawesi Seascape, a priority area of the SOMACORE Programme, which envisages to scale up solutions for coastal ecosystems management. Both sites are on the less exposed western side, however their unique governance mechanisms and location provided a comparative perspective. *Figure 3* provides an overview of their respective geographical location. The study examined MPAs managed by LGUs in Mabini and Hinunangan, a foundation-led approach by the Philippine Reef and Rainforest Conservation Foundation, Inc. (PRRCFI), and a more complex co-management model through a Protected Area Management Board (PAMB) involving the DENR and LGUs in the Biri LaRoSa Protected Area (e-NIPAS). This diversity in governance approaches was intended to help understand the possible dynamics and factors influencing MPA sustainability and potential interest in MPA insurance.

Figure 3. Overview map of study sites



### 4.2.1 Batangas

The Batangas study site, located within the Verde Island Passage (VIP), spans approximately 494,700 hectares across Batangas, Marinduque, Occidental Mindoro, Oriental Mindoro, and Romblon provinces, forming a collaborative management alliance. The highest number of LGU-managed MPAs are located within Batangas, though the focus is clearly on the Mabini municipality, renowned for its diving tourism, a cornerstone of the local economy. Mabini's coastal habitats predominantly feature seagrass beds and coral reefs, with sparse mangrove stands but dense beach forests.

Figure 4. Map of Batangas



### 4.2.2 Negros Occidental

Danjugan Island Marine Reserve and Sanctuaries (DIMRS) in Cauayan, Negros Occidental, spans 144 hectares, encompassing diverse coastal habitats such as coral reefs, seagrass beds, mangroves, beach forests, lagoons, bat caves, limestone forests, and open sea systems. Managed privately under a co-management agreement with Cauayan LGU, DIMRS includes three Special Management Areas (SMAs) as no-take zones, while the remaining island serves as a buffer zone permitting controlled fishing activities. Key stakeholders include the Philippine Reef and Rainforest Conservation Foundation, Inc. (PRRCFI) managing the island and Cauayan's barangay-level LGU, with support from the provincial government of Negros Occidental focusing on initiatives like Bantay Dagat<sup>3</sup> and DRR projects province-wide.

#### 4.2.3 Northern Samar

The Biri LaRoSa Protected Landscape and Seascape is a protected area (PA), comprising the LGUs of Biri, Lavezares, Rosario, and San Jose in Northern Samar province, is an E4DR project site supported by GIZ. Encompassing 808.5 hectares, the PA features diverse coastal habitats including coral reefs, seagrass beds, mangroves, beach forests, and distinctive wind-swept rock formations. Regular exposure to typhoons poses significant challenges for the area. Key stakeholders include the four LGUs, the Protected Area Management Office (PAMO), and the DENR Regional Director representing the PAMB. Additionally, governmental agencies such as Bureau of Fisheries and Aquatic Resources (BFAR), the provincial government, and sectoral representatives contribute to the PAMB's activities and management efforts.

### 4.2.4 Southern Leyte

The municipality of Hinunangan manages five locally declared MPAs, two of which are located in San Pablo Island and San Pedro Island and were the site of the Focused Group Discussion (FGD). The islands can be reached by a 20- sitter motorized boat from the Barangay Canipaan. San Pablo Island is filled with resort establishments for local tourist while San Pedro is mostly a fishing community. San Pablo has an impressive reef protection coverage of 36 hectares established with municipal ordinance no. 2012-04. San Pedro follows with a 31.7 hectares legislative declaration of barangay ordinance no 2013-02. Fringing coral reefs and patches of seagrass area surround the islands with sandy beaches along the coastline. No mangrove communities have historically thrived in these islands.

Figure 5. Map of Negros Occidental



Figure 6. Map of Northern Samar



Figure 7. Map of Southern Leyte



<sup>3</sup> Bantay Dagat, also known as the Sea Patrol, is a community-based volunteer organisation that works with local and national government officials to protect the marine environment.

## 4.3 Key stakeholder groups

This pre-feasibility study engaged a diverse range of stakeholders at national, provincial, municipal, and community levels and sought to collect insights from both the private and the public sector. Through this comprehensive stakeholder engagement, we attempted a holistic understanding of the issues at hand, as well as collect a wide range of perspectives and opinions.

At the national level, KIIs were conducted with representatives of ADB, BFAR-FRMD, DENR-BMB, PAGASA, Philippine Crop Insurance Corporation (PCIC), Pioneer Insurance, and the Philippine Insurers and Reinsurers Association (PIRA). ADB has established itself as an important player in promoting innovative financing mechanisms for MPA and conservation efforts more broadly. BFAR-FRMD and DENR-BMB are the two key national level government institutions shaping MPA policy and overseeing implementation. PAGASA is the Philippine's meteorological agency and hence the trusted and well-respected source for typhoon information. PCIC, Pioneer Insurance and PIRA are important players in the insurance industry.

Provincial representatives included the Provincial Disaster Risk Reduction Management Office (PDRRMO), Office of the Provincial Agriculture (OPA), Provincial Planning and Development Office (PPDO), Provincial Government Environment and Natural Resources Office (PGENRO), Provincial Tourism Office (PTO) and PAMB-PAMO (for Biri LaRoSa PA). Municipal stakeholders encompassed the Municipal Agricultural Office (MAO), Municipal Environment and Natural Resources Office (MENRO), Municipal Planning and Development Coordinator (MPDC), Municipal Treasury Office (MTO), Municipal Fisheries and Aquatic Resource Management Council (MFARMC) and the Integrated Coastal Management (ICM) Council. Local private sector representatives included hotel and resort owners, as well as dive shop operators. Community engagement involved interviews with fisherfolks, Barangay officials, and Bantay Dagat volunteers.

### 4.4 Limitations to the study

The results of this pre-feasibility study are based on desk research, two weeks of in-country work, as well as some follow-up online meetings with national stakeholders and GIZ representatives. In-country work was primarily devoted to discussions with various stakeholders at the four different MPAs. The four sites were selected to maximise diversity within the sample: locally managed MPAs (Mabini; Hinunangan), NIPAS protected (Lavezares), as well as privately managed through a foundation (Danjugan/Cauayan).

The desire to lay the foundation for a private-sector insurance business case and related product development motivated GIZ to commission this study. However, very quickly it became clear that many MPAs are not yet in a position to effectively and sustainably integrate insurance into their financing and risk management plans. Any quantitative analysis in light of insurance product development is therefore premature.

It is obvious that studying only four MPAs out of over 1800 in the Philippines is a very limited basis for drawing any final conclusions. This should be kept in mind when reading this report, as some important aspects have likely been missed, while others may be over- or understated. As an example, we got fairly consistent answers from fisherfolks, while the tourism sector is much more diverse and hence more difficult to formulate conclusive statements in this regard.

# 5 Results



The four sites studied proved to be very different and hence made for an excellent sample for a pre-feasibility study: each site exhibits specific characteristics and circumstances. *Table I* provides a comparative overview of the key site characteristics and high-level results.

Table 1. Overview of study site characteristics

Туре	Criteria		NIPAS MPAs			
MPA name	MPA name	San Pablo Is. MS	San Pedro Is. FS	Danjugan Island Marine Reserve and Sanctuaries (DIMRS)	Verde Island Passage (VIP) Mabini	BiriLaRoSa Lavezares
Governance	MPA status (LGU / NIPAS)	LC	GU	LGU	LGU	e-NIPAS
Governance	Legal basis	M.O. 2012-04	M.O. 2013-02	M.O. 2000	М.О.	Presidential Proclamation No. 291 of 2000
Governance	Year MPA established	1999	2000	1991	2017	2000
Typhoon exposure	Exposure to typhoon	Very High	Very High	Very high	Moderate	Very high
Size	Size (ha)	35	32	43	1,140,000	33,492
Habitat	Coral reefs (ha)	55	26	82.5	6427	1806
Habitat	Mangroves (ha)	0	0	2	3192	4110
Habitat	Seagrass (ha)	8	4	40	1832	1281
Ecosystem service	Conservation & biodiversity value	High	High	High	High	High
Ecosystem service	Importance for DRR	Very High	Very High	Medium	Moderate	Very high
Ecosystem service	Blue carbon trade potential	Low	Low	Medium	High	High
MPA management	Quality of management (MEAT / METT rating)	Available	Not available	Level 1 - established (2017)	Level 4 - sustained (2007)	65 out of 110 (2017)
MPA management	Number of direct MPA managers	1	1	1 (PRRCFI)	5 provinces	1 PAMB & 3 LGUs
Economy	Touristic activity	Very important	Very important	Very important	Very important	Very important
Economy	Fishing activity	Very important Very importa		Very important	Very important	Very important
Economy	Other sources of funding		LGU	LGU; Corporate sponsors	LGU; Corporate sponsors	LGU; SAPA, DENR
Governance	MPA management	LGU	LGU	PRRCFI / LGU	LGU	PAMO / PAMB
Insurance Interest in insura		"MPA: cautious yes Tourism: cautious yes Fisherfolks: yes"	"MPA: yes Tourism: not assessed Fisherfolks: yes"			
Insurance	Willingness / ability to nav	Community funds	Community funds	Through sponsors	Moderate / yes	Moderate / yes

While this diversity reflects the reality of MPAs in the Philippines, it is also limiting the ability to draw overall conclusions. First, because only a few trends and commonalities can be derived and second because it is likely that a larger sample would have yielded an even more diverse picture. Nevertheless, the following observations are worth noting:

- Typhoon hazard has been confirmed as a key source of disruption and destruction of MPA assets and ecosystem services, especially for those MPAs facing the Pacific. At the same time, fisherfolks frequently mentioned two additional hazards as very disruptive to their livelihoods: flooding due to heavy rainfall as well as their inability to go out fishing during times of rough sea (not necessarily due to strong typhoons!). The average daily net income for coastal fisherfolks from fishing is around PHP 500 (a fairly consistent figure found across the four sites, with the exception of Southern Leyte, where income from fishing is significantly higher). For MPAs, secondary natural hazards include earthquakes and volcanic eruptions, as well as oil spills and ship groundings as man-made hazards.
- For the four sites studied, local communities do not view **coral reefs** as important natural assets for DRR. This is not to say that coral reefs do not play such a role in the Philippines, but is probably largely due to the small sample size of MPAs visited. In contrast, where **mangroves** are present, they are recognised as an important ecosystem, not only for their services to fisheries, but also to protect the coast.
- Post-disaster MPA rehabilitation work takes two distinctly different approaches to coral reefs and mangroves: while for coral reefs very little interventions are undertaken, basically hoping that "nature will heal itself", mangroves benefit from active clean-up and replanting activities.
- For MPA management bodies, the practical issues and challenges on the ground go far beyond financial risk management. Therefore, a much broader engagement will be required in order to allow any new insurance product to contribute in a meaningful manner to improve conservation outcomes.
- The concept of insurance as a financial risk management tool is known among all stakeholders interviewed. This is very encouraging as it greatly facilitates discussions and potentially product development and testing.
- MPA management bodies invariably share that while funds are available in theory, these are often very difficult

to access. As a consequence, activities often have to be scaled down and delayed. However, this makes insurance an attractive proposition: once integrated into the annual budget and set up in a way that pay-outs go into an account that is much easier to access locally, it may greatly help rapid intervention after major events.

**Fisherfolks** are very interested in getting financial compensation during prolonged periods of Coast Guard bans on going out to sea. They are prepared to contribute financially and even more so to engage in conservation and rehabilitation work in exchange for such a protection.

In the following sections, results are clustered around three thematic areas: i) exposure to typhoons (and to some degree to other hazards); ii) MPA management structure and practises and iii) emerging product concepts that could address some of the identified pain points.

# 5.1 Typhoon exposure and other hazards

Strong typhoons can severely damage or even completely destroy coral reefs (e.g. Hulao Hulao reef in Negros Occidental razed to the ground during Typhoon Odette in late 2021). First damages are observed during typhoons classified as Severe Tropical Storms by PAGASA (equivalent of wind warning signal 3), which may destroy or wash out boats (if not properly sheltered) and demarcation buoys. Generally speaking, locations facing the Pacific Ocean experience higher wind speeds and face a larger number of typhoon events than those sheltered by mountain ridges or further to the west.

When typhoons occur, not only MPAs, but also the local communities are impacted. Disruptions occur even before marine ecosystems may experience some damage. Fisherfolks are regularly unable to go out to the sea due to gale warnings, leading to a direct loss of income where other activities are not available. After major typhoon events, tourism activities typically dip for some time, putting further pressure on income. In addition, damage from freshwater flooding is often cited as almost on par with destruction caused by typhoons. This is a recurring and serious issue for local disaster risk management efforts, compounded by changes in land-use in the river basin, pressure on mangroves and rising sea-levels. Further hazards threatening ecosystems and local communities include tsunamis, turbidity/siltation and marine heat waves leading to coral bleaching, as shown in Table 2:

Table 2.	Key	natural	hazards	to	MPAs	in	the	Philippines
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Site	Severe wind Exposure (Typhoons)	Tsunami	Flooding	Turbidity	Coral Bleaching
VIP	Tropical cyclones classified by PAGASA as Typhoon have an annualized chance of occurrence of 5%	General inundation at 1-6 m depth	Low to high susceptibility	Minimal to Extreme level	Low to severe exposure
Danjugan Island	Tropical cyclones classified by PAGASA as Typhoon have an annualized chance of occurrence of 5%	General inundation at 5-6 m depth	Low susceptibility	High to severe level Low exposure	
Biri LaRoSa	Tropical cyclones classified by PAGASA as Super Typhoon have an annualized chance of occurrence of 5%	General inundation at 1-5 m depth	Low to high susceptibility	Low to high level	Low to moderate exposure
Hinunangan Twin MPAs	Tropical cyclones classified by PAGASA as Super Typhoon have an annualized chance of occurrence of 5%	General inundation at 1-5 m depth	Low to high susceptibility	Low to severe level	Low to moderate exposure

Source: https://hazardhunter.georisk.gov.ph/map#; https://allencoralatlas.org/atlas/#7.89/13.4519/121.4661

**Earthquakes and volcanic eruption**: earthquakes have been observed and recorded to have a significant impact on coral reefs. They occur less frequently than typhoons, but when they do, they can destroy reefs. Volcanic eruption's impact on marine ecosystems is thought to depend largely on the occurrence of volcanic mudflows, i.e. Lahar, and, more importantly, Lahar reaching the marine ecosystem.

Oceanic heatwaves: while not directly damaging the physical structure of coral reefs, heatwave induced coral bleaching occurs in the Philippines, causing at least temporary damage to marine ecosystems. Corals grow back relatively quickly after light bleaching events, unless the substrate structure has been taken over by algae.

Siltation: heavy rains often cause freshwater flooding and erosion along rivers and streams, potentially causing siltation of reefs close to the shore when mangroves are damaged or absent as a buffer between river mouths and coral reefs. Unregulated activities such as logging, as well as illegal settlements along the river aggravate this risk.

**Illegal fishing**: non-respect of designated no-catch zones is the most widely reported man-made threat to MPAs. Luckily, the

use of explosives and cyanide appears to have stopped. However, deliberate violations of no-catch zones are relatively common, with compressor-fishing the most widely reported technique.

Unsustainable tourism: dive-related tourism is often seen as a blessing and a curse: a blessing because it generates non-fishing income, not only for the dive resort owners, but also for many members in the local community. At the same time, inexperienced divers that are not properly briefed and accompanied during dives may cause damage to corals through accidentally or intentionally touching corals, disturbing local wildlife or even breaking corals. Furthermore, where mooring buoys are missing, boats may damage corals when anchoring. Finally, the recent boom in free-diving has created a new set of issues, as free-divers may deploy guiding ropes with weights that can impact corals. Finally, inexperienced free-divers may destroy corals inadvertently with their fins.

Ship grounding and oil spills: with many parts of the Philippines' waters being used by commercial shipping, ship groundings on coral reefs occur from time to time. Oil spills are another man-made disaster that have been observed in the Philippines.

### 5.1.1 Batangas

Based on PAGASA's dataset, the Province of Batangas faces the lowest typhoon exposure among the four study sites. Especially Mabini has an annualised 5% chance of being hit by a typhoon with wind speeds between 120 - 170 km/h (equivalent to *Typhoon* according to PAGASA classification), while for other areas in the province the expected wind speeds can reach 220 km/h. This is in line with feedback from local stakeholders, who consider typhoon being a secondary threat to their MPAs and related economic activities. Seismic risks, however, are substantial as several fault lines cross the province and due to its proximity to the Taal volcano. In addition, illegal fishing activities, ship grounding incidents and solid waste pollution are threatening the health of coral reefs in the area.

Figure 8. Typhoon exposure for VIP

### 5.1.2 Negros Occidental

Danjugan Island has a fairly high exposure to typhoons, with an annualised 5% chance of being hit by a typhoon with wind speeds between 170 – 220 km/h (equivalent to *Typhoon* or *Super Typhoon* according to PAGASA classification). Stakeholder interviews confirmed this higher exposure, as all still very vividly remembered Super Typhoon Odette from late 2021, which damaged reefs and built infrastructure in the area. Unfortunately, no systematic damage assessment was performed and hence no precise loss estimates with regards to coral reefs can be provided. Other hazards to the MPAs stem mainly from illegal fishing activities, volcanic eruptions as well as oceanic heat waves.



Source: <u>https://hazardhunter.georisk.gov.ph</u>

Figure 9. Typhoon exposure for DIMRS



Source: https://hazardhunter.georisk.gov.ph

### 5.1.3 Northern Samar

The province of Northern Samar is highly exposed to typhoon risks, as for most areas the expected 20y-typhoon will have wind speeds between 220 - 270 km/h, (equivalent to *Super Typhoon* according to PAGASA classification). However, the MPA of Lavezares is somewhat sheltered and in consequence can expect wind speeds to reach 170 - 220 km/h. Damage to mangroves was reported after Super Typhoon Tisay (2019), which destroyed roughly 100 ha and completely washed out demarcation buoys. In the meantime, 40 - 60 ha of mangroves have been replanted. Illegal fishing activities and logging in mangroves are mentioned as secondary threats to the MPAs in the province.

Figure 10. Typhoon exposure for Biri LaRoSa

### 5.1.4 Southern Leyte

The Twin Island MPA in Hinunangan have a very high exposure to typhoons, which is not surprising given their location facing directly the Pacific Ocean. Wind speeds for the strongest typhoon within a 20-year period are expected to reach 220 - 270 km/h, equivalent to *Super Typhoon* according to PAGASA classification.



Source: https://hazardhunter.georisk.gov.ph

Figure 11. Typhoon exposure for Hinunangan Twin Island



Source: https://hazardhunter.georisk.gov.ph

### 5.2 MPA management

### 5.2.1 Governance structure

In the visited study sites, the locally managed MPAs are overseen by management councils led by the municipal mayor. These management councils typically include LGU officials, community leaders, fisherfolk associations, NGOs like PRRCFI in the case of DIMRS and academic institutions such as Batangas State University, as well as scientific advisors like Romeo Trono in Mabini, Batangas. In NIPAS PA like Biri LaRoSa, the PAMB is chaired by the DENR Regional Director and includes representatives from involved LGUs (e.g., Biri, Lavezares, Rosario, San Jose), NGOs, academic institutions (e.g., University of Eastern Philippines), private sector (aquaculture operators), fisherfolks representatives, and other stakeholders such as tourism service providers. *Figure 12* provides an overview of the respective governance structure.

The management councils focus on ecosystem conservation, supported by enforcement committees overseeing surveillance of the protected zones. Monitoring and evaluation committees assess program effectiveness, while Information, Education, and Communication (IEC) teams ensure community awareness and engagement. Effective financial management through fund sourcing and proposal development is crucial to sustain these conservation efforts, ensuring the long-term viability of the PAs and their associated programs. With the exception of Mabini, all other sites visited indicated severe financial constraints are one of the key reasons why not more was done for biodiversity conservation and rehabilitating degraded sections of the MPA.

**Batangas**: The MPAs in Mabini, Batangas Province, are dominated by the interest of local tourism operators. While not all tourism activity in the area can be classified as eco-tourism, MPA management councils focus on conservation in order to keep the sites attractive for divers.

**Negros Occidental**: The activities at DIMRS MPA in Cauayan, Negros Occidental, are dominated by PRRCFI, though overseen by the MPA management council, which does not come without frictions. The provincial government of Negros Occidental lends support on initiatives like the Bantay Dagat and DRR projects.

Northern Samar: The Biri LaRoSa PA is managed by a very diverse PAMB. While the inclusion of various stakeholders is intended to bring about consensus and buy-in from all, it looks like this is sometimes slowing down decision making and negatively impacts conservation efforts.

Southern Leyte: The MAO has the primary mandate for the management, maintenance and monitoring of these marine sanctuaries. The municipal mayor's office is involved in the

law enforcement since the Municipal Fishery Law Enforcement Team is deputized by the Municipal mayor. The BFAR 8 also provides technical and socio-economic support for the people's organization in the island including fish-pens and establishment and maintenance of the Community Saving System. Other NGOs active in the islands include GIZ, Rare Philippines and UP MSI.

The risks, challenges and constraints MPA management bodies face are multiple. Yet, at the sites visited, people involved are determined to face them head on and make the most of available resources. Apart from the direct threats from natural hazards and man-made disasters already mentioned, the following two constraints are worth mentioning as frequently discussed topics, independent of the protection status, size or management structure of the MPA:

- Political will at a local level: Where local political leaders are fully behind conservation efforts and recognise the importance of MPAs in their region, MPA managers have a much easier life compared to their counterparts where this is not the case. Local politics quickly come into play, not only when coastal development projects are discussed, but also when fishers are caught engaging in illegal fishing activities, to name just two examples. Given the relatively small size of many MPAs, political will is important not only within the municipality directly involved, but also in neighbouring ones. On a more structural level, MPA management depend on appropriate funding, which is closely linked to politicians setting their priorities.
- Budgeting and disaster preparedness: The on-the-ground management bodies of MPAs are often underfunded, even when in theory additional funds were reserved for their activities. Accessing funds is often described as cumbersome and time-consuming. MPA activities follow an annual budgeting process, which appears to be relatively rigid and frustrating. Activities that are not budgeted for are difficult or even impossible to implement and at the same time the allocated budget should be used as otherwise next year's funds may be reduced. In combination, this leads to a situation where MPAs are unable to build up reserves to respond to unforeseen events. As a consequence, postdisaster investments into rehabilitation or simply replacing lost assets such as patrol boats and demarcation buoys can take several years.

In summary, MPA management is typically multi-layered and involving a large number of local, but also provincial and sometimes national stakeholders. Where all stakeholders are aligned, this set-up presents huge benefits, but where this is not the case, effective management becomes challenging. For collaborations with the private insurance sector, especially when large financial commitments are involved, efficient management processes are key.







Figure 13. Funding structure of locally managed MPAs

### MPA funding structure for locally-manged MPA



### 5.2.2 Economic profiles and MPA funding structure

The economic profiles of the four study sites share similarities, with Mabini, Batangas, standing out due to its urban characteristics and focus on dive tourism, including a growing free-diving community. Unlike the other sites, Mabini has fewer fisherfolks, many of whom participate in the tourism sector as boat captains or crew during peak seasons. Fishing activities in Mabini are primarily hook, line and gill netting, with catches mostly for local consumption. However, resort operators often source seafood from outside Mabini to ensure stable supply and take advantage of lower prices. Tourism and fishing coexist harmoniously, though conflicts occasionally arise due to encroachment on the MPA and user conflicts between free-divers and scuba divers. The Mabini LGU has addressed these issues through its ICM plan, designating specific areas for free-diving.

The other three sites – Cauayan in Negros Occidental, Hinunangan in Southern Leyte, and Lavezares in Northern Samar – are rural, with fishing and agriculture as primary livelihoods. During bad weather, fisherfolk often turn to farming for subsistence. Especially fisherfolks in Lavezares reported a significant share of their income from agriculture, as prolonged bad weather extends fishing disruptions. Opportunities for aquaculture exist but are not widely adopted due to high feed costs, which can account for 50% of operational expenses. Common practice among fisherfolk in all sites is to sell fresh catch and buy canned goods and rice. Fisherfolks typically pay MAO an annual registration fee of PHP 50 as individuals and PHP 200 for a boat.

Municipal LGUs differ in classification and economic activities, which directly influences the resources available for MPA management. Mabini (1st Class Municipality, annual income  $\geq$ PHP 200M) benefits from numerous resorts, commercial zones, and some industries. Cauayan (1st Class, annual income  $\geq$  PHP 200M) transitioned from an economy dominated by mining to agriculture, commerce, and a few resorts. Hinunangan (3rd Class, annual income  $\geq$  PHP 130M) and Lavezares (4th Class, annual income  $\geq$  PHP 90M) focus on agriculture, commerce, and limited resort activities.

Apart from general tax allocations, locally managed MPAs benefit from two funding sources: Environmental User Fees (EUF) and eco-tourism entrance fees. EUF are levied on visitors and divers, typically in the range of PHP 50/d for non-diving tourists, PHP 150/d for free-divers and PHP 200/d for divers. *Figure 13* provides an overview of the funding structure of locally managed MPAs, while *Figure 14* shows the same for NIPAS sites, using the example of Biri LaRoSa.



### Funding structure for NIPAS PA Biri LaRoSa

For NIPAS PAs, the key funding comes in the form of budget allocations from DENR to the respective PAMO. In addition, fees from Special-use Agreement in Protected Areas (SAPA) can top up these DENR funds. The PAMO collects annual SAPA fees from private sector users and enterprises within the PA, based on the area these activities occupy and investments made on landscaping and development: 5% of the zonal value x area used plus 1% of improvement value. It is noteworthy that impacts on the environment are not part of the calculation. From the collected SAPA fees, PAMO sends 25% to DENR's Integrated Protected Area Fund (IPAF). Each PA can submit project proposals for funding to the IPAF, independent from the amount it contributed to it.

Overall, the integration of tourism and traditional livelihoods in these sites highlights the need for balanced economic development. Addressing conflicts and ensuring sustainable practices through policies like the ICM plan and the General Management Plan of PAs are crucial for long-term resilience and sustainable financing mechanisms. A more detailed description of economic aspects of the four study sites can be found in *Annex 2*.

The valuation of ecosystem services provided by MPAs is likely to further evolve over the next few years. The insurance industry is only starting to integrate them into their underwriting models and monetisation will partly depend on a firm establishment of blue carbon and biodiversity credits, respectively. *Table 3*  shows a first valuation of biodiversity and blue carbon services at the four study sites based on data for corals and seagrass taken from the Allen Coral Atlas (<u>https://allencoralatlas.org/atlas</u>), for mangroves taken from the Global Mangrove Watch (<u>http:// www.globalmangrovewatch.org</u>) and applying the valuation methodology by Rudolf de Groot et al. (2020). These are impressive amounts provided to society and only a fraction of them is currently captured in monetary terms.

### 5.2.3 Disaster preparedness and postdisaster behaviour

At the level of MPA management bodies, disaster preparedness and contingency planning is weak at the sites visited. Apart from efforts to secure patrol boats when a typhoon is approaching and supporting staff and the wider community to cope with the immediate effects of a calamity, no detailed contingency plan seems to exist. This goes hand in hand with the fact that typically no comprehensive damage assessment is performed. The MAO is leading efforts to oversee the post-disaster assessment, rehabilitation and maintenance work.

**Coral reefs**: As stated above, most MPAs in the Philippines – and all of the sites studied – favour passive reef restoration. However, our research points towards challenges with implementing an

_	Verde Island Passage		Biri LaRoSa		Danjugan Island		Hinunangan Twin MPAs	
Coastal habitat	Area (ha)	ESM (in million USD)	Area (ha)	ESM (in million USD)	Area (ha)	ESM (in million USD)	Area (ha)	ESM (in million USD)
Coral reef	6,427	1,019	1,806	287	82	13	81	13
Seagrass meadows	1,832	156	1,281	108	40	1	12	3
Mangrove forest	3,193	249	4,110	320	2	0	0	0
Total	11,452	1,424	7,197	715	124	14	93	16

Table 3. Valuation of ecosystem services (biodiversity and blue carbon) for the four study sites

orderly passive restoration for reefs and especially marine wildlife on such reefs: when demarcation buoys and/or patrol boats are lost to a typhoon, monitoring and enforcement effectively stops and fisherfolks tend to encroach on no-take zones. To what extent increased pressure on fish stocks through illegal fishing post-disaster is having a long-term impact is unclear, as related monitoring data is typically missing. Yet, it would come as a surprise if there were no adverse effects, especially when proper enforcement is suspended for a prolonged time. Unfortunately, due to lengthy procurement processes for replacing lost demarcation buoys and patrol boats, this often seems to be the case.

An increased protection of the core zone of an MPA immediately after a typhoon event is critical to allow fish to regroup. Some site managers even suggested that it could be beneficial to expand the no-catch zone for a limited time (four to eight weeks) post-event in order to facilitate this regrouping phenomenon. For example, the buffer zone could be declared a no-catch zone for up to one month. To what extent this would really help marine wildlife to better bounce back is a topic worth exploring. It would, however, certainly have to be coupled with financial support to fisherfolks during this period, as they would face increased challenges due to the expansion of the no-catch zone. Long-term engagement with the local community and sustainable financing mechanisms will be critical to the success of this approach. Experience has shown that building trust and understanding within the fisherfolk community is possible and pays off, as long as all other stakeholders are on board.

Mangroves: In contrast to coral reefs, mangroves routinely benefit from active rehabilitation efforts post disaster. This involves cleaning up degraded and damaged areas as well as replanting seedlings in order to restore the mangroves. These efforts may stretch over several years and obviously depend on the availability of funds. Typically, local community involvement is very strong: fisherfolks are mobilised, trained and employed, i.e. receive a modest financial compensation, often in a cashfor-work arrangement. Compared to active reef restoration, rehabilitating damaged mangroves is a low-cost, low-tech activity and can be done in patches. All this allows for a flexible response, triggering activities when funds are available and during periods when fisherfolks are less busy. However, proper planning and implementation is key in order to create a healthy, robust mangrove with minimal losses of seedlings.

Fisherfolks community: During and immediately after major typhoon or flooding events, the community typically is in survival mode. Government entities provide assistance in the form of food packages and sometimes building materials. However, indirect impacts on ecosystems are widely reported to occur through two avenues:

- Some community members may resort to illegal logging on land and in mangroves in order to fix or rebuild their houses. This is totally understandable and often more or less tolerated: people want to fix their houses quickly and nobody argues in earnest against this. At the same time, such behaviour is unfortunate, as it not only potentially increases the extent of future damage, but also increases the post-disaster rehabilitation efforts in replanting trees and mangroves.
- Monitoring and enforcement of MPA protection rules are sometimes weakened or outright suspended after major events, which triggers an almost immediate influx of fisherfolks into the no-take zone. First, enforcement staff are typically affected by the disaster's impact, too, and like their community peers need to deal with the immediate aftermath. Second, demarcation buoys or even patrol boats may get lost. Especially missing demarcation buoys are considered an easy and somewhat plausible excuse for fishing within the no-catch zone.

**Tourism**: The sector has not yet developed a uniform response to disasters beyond immediate clean-up and repair works to tourism-related infrastructure. Most of the staff employed at resorts are

from the local communities and some resort owners tend to keep the permanently employed ones even in the absence of tourists in the aftermath of calamities. Temporary hires are, however, not compensated, nor are boatsmen and tour guides that almost always work on a freelance basis.

# 5.3 Insurance product concepts

The diversity of MPA stakeholders and multitude of challenges they face ask for a suite of insurance approaches that can contribute to increased resilience and lead to better conservation outcomes. In other words, not one, but a menu of insurance products should be developed, allowing MPAs and their diverse stakeholders to create an individual combination that meets their specific needs. Most of the underlying insurance concepts, e.g. property and business interruption insurance, are already well established in the Philippines, which should allow for swift product development once the enabling pre-conditions are met. MPAs are well advised to establish a comprehensive risk management approach and corresponding financing tools, including restoration funds, contingent credit lines and insurance (ADB, 2022).

Based on international experience and insights gained from stakeholder interviews, the following four areas have been identified as suitable candidates for insurance product development. In order of increasing technical complexity, they are:

- Monitoring and enforcement assets. Especially demarcation buoys and patrol boats, but also other critical infrastructure such as watchtowers and piers used by MPA enforcement staff should be insured in order to allow quick replacement or repair after typhoon-related losses. This is likely the most straightforward insurance product connected to MPAs and should be in place for all types of MPAs and independently of the quality of management practises. Premium payments should be integrated into annual MPA budgets as a recurring cost and the MPA would be the policy holder. As the objects covered are assets with fairly standard values<sup>4</sup>, traditional insurance approaches can be used as long as the insurance company can guarantee a quick loss assessment and claims pay-out process. Alternatively, parametric or hybrid insurance solutions can be developed, though these are typically much more complex to set up and calibrate.
- Business interruption for fisherfolks. The inability to go out fishing due to rough seas and corresponding formal restrictions issued by the Philippines Coast Guard has a direct impact on fisherfolks. While this is an inherent risk to

their activity and, to some extent, normal, these restrictions contribute to hardship during severe weather events. From an insurance perspective, the corresponding product could be set up quite easily, as the triggering action is the Coast Guard's notice to mariners banning sea activities. Technically, such a product is quite similar to hospital cash products, where each night a patient spends at the hospital triggers a predetermined pay-out. Not each single day fisherfolks are unable to go out needs necessarily to trigger a pay-out. In order to minimise premiums, only prolonged periods of Coast Guard imposed fishing bans could be insured. Such a scheme could also include a forecast-based element, allowing fisherfolks to stock up in anticipation of major events. The biggest challenge with this product is not technical, but financial: most fisherfolks are unable to pay full insurance premiums and expect substantial support. However, they are willing to contribute in-kind through community work and ecosystem rehabilitation (e.g. mangrove replanting). This leads to interesting perspectives, which are discussed in section 6.3, together with the different options with regard to potential policy holders.

- Business interruption for tourism sector. Similar to fisherfolks, the various stakeholders in the tourism sector, i.e. resort owners, dive operators, restaurants, boatsmen etc. suffer from loss of income when major natural calamities reduce their ability to host tourists. The trigger level and amounts involved would certainly be different from those used to compensate fisherfolks, but the underlying concept is basically the same. The business owners would be the policy holders and have to pay the insurance premium. Some spill-over effects into the community could be expected if for example resort staff receive some compensation, too. However, a positive link between insuring tourism operators and increased protection of the ecosystem they depend on is difficult to establish.
- **Clean-up and rehabilitation activities.** Both, mangroves and coral reefs benefit from rapid clean-up and rehabilitation activities after a major event. MPAs routinely engage in mangrove clean-up and rehabilitation, involving the local communities. However, these are often delayed and scaled down due to limited financial resources available. A bespoke insurance policy could change this, providing funds after typhoon related damage to mangroves. Parametric insurance is likely the most appropriate approach here and proceeds would be used for damage surveys<sup>5</sup> clean-up, and rehabilitation work. The MPA would be the policy holder and paying the premium, though partial premium support by third parties such as BFAR could be considered, as discussed in *section 6.3*.

<sup>4</sup> As indicative values, the following figures can be considered realistic: demarcation for a 20ha MPA: PHP 50k; basic patrol boat: PHP 250 - 300k; advanced speed patrol boat: PHP 2M watch tower PHP 300 - 500k

<sup>5</sup> Under parametric insurance, damage surveys and loss assessments are not required to determine the amount of pay-out. However, damage surveys are useful in order to improve the index correlation.

Given the complexity and challenges surrounding effective and sustainable protection of marine biodiversity while acknowledging the needs and constraints of local fisherfolks, tourism sector and the wider community, only a long-term, integrated approach has any chance to succeed. "Ridge-to-Reef" is a slogan describing such an integrated approach and often employed in the Philippines, but rarely implemented. Those in charge of managing a specific MPA can only succeed if supported by all stakeholders, as well as if funded adequately. Therefore, any new insurance product related to MPA activities and stakeholders needs to be carefully embedded in a suite of support measures in order to create a positive impact – directly or indirectly – on the ecosystems at the heart of MPAs.

### 5.3.1 Insurance industry perspective

The Philippine insurance industry has not yet developed a firm stance on MPA insurance, which is hardly surprising given the novelty of this topic. Accordingly, reactions when exposed to the initial study findings ranged from very cautious to highly interested in exploring this topic in more detail. Members of the Philippine non-life insurance sector have raised two key open questions: a) is there really a private-sector business case for covering MPAs against typhoons? And b) which products related to MPAs would fall under the remit of the Government Service Insurance System (GSIS) - and where could private insurers play a useful role? Encouragingly, several representatives insisted that insurance solutions for ecosystems only stand a chance to work as intended when deeply rooted in a holistic approach, i.e. a meaningful involvement of all stakeholders, comprehensive management and financing plans, as well as robust monitoring and evaluation.

So far, all insurance pilots related to MPAs in the Philippines have been initiated by third parties and not by Philippine insurance companies, though this is likely about to change. However, a surprisingly diverse number of activities have been identified (see section 3.2), covering some key aspects of potential future solutions. Interestingly, most insurance company representatives did not seem aware of the various initiatives in this field or did not want to share further insights. All new efforts to develop insurance for MPAs concentrate on parametric approaches. However, the only product that already covers damages to coral reefs – ship-owner's liability in case of a vessel's grounding on a reef – is an indemnity-based product, requiring physical inspections of damage done and sophisticated calculations in order to estimate the monetary value of lost ecosystem services.

# 5.3.2 Initial reception of MPA insurance as a concept

During the FGDs and KIIs, stakeholders expressed cautious interest in MPA insurance to safeguard their investments in infrastructure like demarcation buoys, guard houses, and patrol boats used in daily operations. MPA management bodies recognized the benefits insurance can have, allowing for continued monitoring and enforcement activities, as well as quicker and more extensive mangrove replanting after destructive typhoon events. They believe being able to finance insurance premiums for monitoring and enforcement assets through their annual budgets, but expect co-payments for mangrove replanting protection.

Fisherfolks and Bantay Dagat members were very keen on the idea of a business interruption insurance kicking in when they are formally prohibited from fishing. They insisted that pay-outs would have to be very quick and painless, preferably through an e-wallet. However, they also made clear that they expect significant premium support from third parties, pointing to their often precarious financial situation. What they offered in return is increased participation in community works such as coastal clean-ups and mangrove replanting.

Surprisingly, resort owners and tour operators were the least enthusiastic about insurance related to typhoons or MPA services. This finding should not be over-interpreted, as the sample size in our study was rather small.

# 6 Conclusions



# 6.1 Exposure and historical damages

All stakeholders confirmed the initial hypothesis: typhoon is a key hazard to the physical integrity of many MPAs in the Philippines, as well as to local communities. However, additional hazards such as earthquakes and volcanic eruption have been identified as important to varying degrees, depending on the geographical location. For fisherfolks, the impacts from freshwater flooding on their livelihood is often on par with those from typhoons.

MPAs reported damage to mangroves and coral reefs from tropical cyclones classified by PAGASA as Typhoon or stronger, i.e. with wind speeds exceeding 118 km/h. Unfortunately, no concrete loss estimates exist for the study sites as post-event damage assessments were not done in a systematic manner.

Marine wildlife: despite the restrictions to fishing within MPAs, fisherfolks report reduced catch rates in the surrounding waters for the last decade. With MPA enforcement practises often patchy it is impossible to determine to what extent the observed loss of fish population is a direct result of local overfishing, illegal fishing practises or linked to larger downward trends due to pressure from commercial fishing or climate change.

### 6.2 Post disaster behaviour

Irrespective of governance structure and status, all MPAs struggle with enforcing the protection afforded to the ecosystems on paper, be it because of severe budget constraints or political interference. Currently, most MPAs lack adequate and sustainable financing as well as robust contingency planning. Ideally, this should be addressed before engaging them on potential insurance solutions. The following three elements should arguably be part of any MPA contingency plan for minimising typhoon related losses:

- Rapid replacement of lost or damaged demarcation buoys and patrol boats. These are absolutely critical assets to safeguard the core zone of any MPA, and experience shows that missing buoys provide for an easy excuse to fish within the no-catch zone. Replacements could be financed through a dedicated fund or reserve, but current practices make this not a viable solution. Initial discussions point towards a likely quicker process if insurance were used instead of a budgetary reserve.
- Mangroves clean-up and replanting. Cleaning up impaired mangroves helps to minimise secondary damage and prepares the ground for replanting activities. A science-based approach should inform proper training of communities involved in order to maximise benefits. Involving and paying local communities for replanting mangroves would both provide them with welcome income as well as deepen their sense of ownership. The related costs could be covered through a mangrove replanting insurance.

**Compensation to fisherfolks for temporarily expanded no-take zone**. An expanded no-catch zone post-disaster was suggested as a means to boost local fish populations. A business interruption insurance for fisherfolk is currently already under development and could easily be adapted to this use-case. A temporary fishing ban could also be combined with mangrove replanting: in exchange for temporarily ceasing fishing activities, fisherfolks are paid for replanting mangroves.

The last point, a temporary expansion of the no-take zone after typhoon events and compensating fisherfolks for related lost income is a novel approach which needs to be studied in more detail, including in pilot schemes. It would be the opposite of what frequently happens: an influx of fisherfolks into the no-take zone immediately after typhoons, which is partly tolerated on humanitarian grounds, but risk becoming permanent when monitoring and enforcement activities are not resumed.

### 6.3 Insurance approaches

Safeguarding marine biodiversity and properly managing MPAs require at the minimum adequate and reliable financing. Insurance can and arguably should be part of MPA financing strategies. All MPA management bodies interviewed pointed to complex budgeting and lengthy procurement processes, which potentially could be circumvented through insurance: annual insurance premium payments are much easier to budget and manage than reserves for losses due to infrequent events such as strong typhoons. The study has identified three distinct ways how insurance solutions can directly contribute to better conservation outcomes: by protecting monitoring and enforcement assets, by financing clean-up and rehabilitation efforts and by compensating fisherfolk communities for lost income, reducing pressure on ecosystems after major calamities. Business interruption for tourism actors, as discussed in section 5.3, is useful for safeguarding the local economy, though it's potential effects on ecosystems is far from straightforward.

Monitoring and enforcement assets: to cover these assets, both traditional indemnity and parametric insurance approaches can be considered. The advantages of traditional insurance include the insurance industry's extensive experience with property insurance, which should allow for quick and inexpensive product development, as well as the absence of basis risk: washed-out buoys and destroyed patrol boats get replaced, which may be tricky to model on an index-basis. The disadvantage is a lengthier claims process compared to parametric insurance, unless the insurer can make use of advanced loss assessment techniques or rapid on-site inspections. Ultimately, the design decision lies with GSIS, which is currently the sole insurance company permitted to insure government assets.

Accessing insurance pay-outs swiftly to replace monitoring and enforcements assets would likely require adjustments to procurement processes and the set-up of a dedicated account where this is not available yet. Alternatively, the insurance contract could be structured in such a way that financial compensation is paid for damage surveys and similar expenses the MPA incurs after a major event, but lost assets such as demarcation buoys and patrol boats are provided in kind by the insurer. An in-kind service may have the additional advantage of reduced procurement costs, at least once the insurer covers a large number of MPAs.

Clean-up and rehabilitation insurance: for this type of protection, all insurance approaches could be considered: traditional, parametric and hybrid. Indemnity-based insurance would work for MPAs that routinely and systematically survey and assess their ecosystems - today rarely the case, unfortunately, but definitively part of good practises. Such survey reports would provide an excellent baseline for damage assessments. Until this is an established practise, a parametric or hybrid approach is more practical. However, MPAs are unlikely to be in a position to absorb related insurance premium on their own. Provided thirdparty funding can be mobilised, this doesn't need to be a bad thing per se, as it opens up the opportunity for performance-based support: MPAs that meet a minimum threshold of management quality and conservation outcome would qualify for premium support for rehabilitation insurance. Such a set-up would both set aspirational goals for MPAs and provide insurance companies with an indication about their counterparts' quality.

Business interruption for fisherfolks: in its basic form, insurance pay-outs can be based on the number of days the Philippine Coast Guard (PCG) prohibits fisherfolks going out fishing. From a design perspective, this is straight-forward. However, the ability to pay among fisherfolks is low and hence take-up will be insufficient to have a systemic impact in the community – unless substantial premium subsidies can be mobilised. There are good arguments for premium support on social grounds, as most fisherfolks are resource constrained. In addition, this would open up new possibilities for faster ecosystem rehabilitation, if premium support is conditional to fisherfolks' participation in community work such as mangrove replanting.

If the above-discussed idea of a temporary expansion of the no-take zone after major typhoon events were to be pursued, a parametric insurance approach would be imperative. A completely independent trigger is required to close the buffer zone to fishing. As the effect of such short-term fishing bans on fish populations are not yet well understood, pilot test should be accompanied by robust monitoring and evaluation programs.

**Policy holders**: for locally managed MPAs, the MPA management council would be the body buying insurance to protect monitoring and enforcement assets, as well as to fund clean-up and restoration efforts. With regard to business interruption for

fisherfolks, MPA management councils are likely the best option for becoming the policy holder, too, especially when coupled with clean-up and restoration work and substantial subsidies. Alternatively, local associations and people organisations could become policy holders, too.

In the case of NIPAS PAs, the respective PAMOs will be the most likely policy holders. Alternatively, DENR could buy insurance on behalf of one, several or all PAs, which would allow for economies of scale and diversification. One of the challenges with a centralised approach would be to keep insurance processes lean and ensure any pay-out would quickly benefit those affected and not be negated by lengthy administrative processes.

MPA insurance trust fund: The establishment of a trust fund for insurance purposes at the provincial or even national level could be the logical next step after piloting first insurance solutions with individual MPAs. A dedicated trust fund could make sense if substantial third-party premium support were involved and/or as an alternative to reforming and streamlining MPA decision making and procurement processes. Such a trust fund could well be structured as aspirational: only MPAs that meet strict performance goals and show robust conservation outcomes would qualify and benefit from substantial premium support. From an insurance perspective, such a trust fund would allow for substantial benefits of scale and internal diversification, thus lowering costs and attracting more interest. In addition, such trust funds would offer an attractive platform to private sector sponsors or NGOs willing to financially support conservation efforts in the Philippines.

# 7 Recommendations



In order for MPAs to truly benefit from insurance, a couple of essential preconditions need to be put in place either before or in parallel to developing new products. Support to MPAs should focus on strengthening management structures and processes, securing sufficient and sustainable financial resources and developing clear contingency and post-disaster recovery plans for the event of natural calamities such as typhoons. These efforts will likely require discussions at the national level in order to mobilise appropriate funding for conservation work and social assistance to vulnerable fisherfolks. For insurance product development, we recommend starting with a "low-hanging fruit" in order to create positive momentum: property insurance for MPA management and enforcement assets. An indemnity-based insurance product should be perfectly suitable, provided the insurance company can guarantee a quick loss assessment process. Once this product is established and its benefits appreciated, parametric mangrove replanting insurance and business interruption for fisherfolks should be introduced. The establishment of a trust fund for MPA insurance purposes at the provincial or even national level could be considered at a later stage as a means to increase coordination and collaboration among MPAs.



# Annex 1 Mindmap of MPA selection criteria



# Annex 2 Governance and economy of studied MPAs

### Batangas

The Batangas study site, located within the Verde Island Passage (VIP), spans approximately 494,700 hectares across the five provinces of Batangas, Marinduque, Occidental Mindoro, Oriental Mindoro, and Romblon, forming a collaborative management alliance. Within Batangas, which is home to the highest number of participating local government units (LGUs), the promotion of MPA-related activities focuses on Mabini municipality. Mabini is renowned for its dive tourism, which now forms a cornerstone of the local economy. Mabini's coastal habitats predominantly feature seagrass beds and coral reefs, with sparse mangrove stands but dense beach forests. Interviews highlighted extreme weather threats such as infrequent typhoons and seismic risks due to its proximity to fault lines and the Taal Volcano. Man-made threats include illegal fishing, ship grounding accidents, and solid waste pollution, all posing risks to the health of coral reefs in the area.

### Provincial level

Batangas is a 1st class provincial LGU with assets worth PHP 25.2B and yearly revenues of PHP 4.5B in 2020 (Commission of Audit), making it largest municipality in the whole of Luzon with 30 municipalities under its jurisdiction. It is also the largest member of the Verde Island Passage (VIP) network of MPAs. The Office of the Provincial Agriculture (OPA) is lending support to various livelihoods from tourism, agriculture, aquaculture, commercial and industrial sectors. Batangas also accesses the Provincial Disaster Risk Reduction Management Office (PDRRMO) funds for their province-wide Bantay Dagat honorarium support. The PDRRMO is also in the forefront of handling natural threats including typhoons, storm surges, earthquakes, volcanic eruptions, and landslides, as well as man-made threats such as ship groundings, oil spills and pollution. In fact, PDRRMO is a fund source for the other departments since it receives 5% of the provincial national tax allotment (NTA), equivalent to PHP 200M/year. These funds are split by 70% for prevention and mitigation, while 30% are

allocated to a quick response fund, which finances emergency measures during and after a calamity. Any fund not spent because there was no calamity will be transferred to a trust fund, which holds it for five years. In case the funds will not be spent during these five years, they will automatically go to the general fund of the Provincial LGU. Therefore, when some officials say they are "under spending" it can mean both: that no calamity has happened and hence the funds set aside were not used – or that funds available were not used so that they can later be reassigned to the general fund.

The representatives of the provincial LGU are aware of various insurance products for property, crop, accident, and life insurance and they show interest in learning about MPA and fisherfolk insurance. According to them, if this insurance product is developed, the potential uses of insurance funds could include construction of water treatment facilities, MPA rehabilitation, passive reef restoration, as well as artificial reef deployment. Artificial reefs are considered in different parts of the province, though not in Mabini. Mangrove tree planting, awareness campaigns and funding the Bantay Dagat honorarium are other areas they would potentially spend any insurance pay-out for. They also suggested that a baseline assessment of the ecosystems within the MPA would be required before setting up an insurance scheme in order to accurately define losses and pay-outs. So far, no natural resource accounting and valuation studies have been performed. Fisherfolk insurance could act as business interruption insurance, providing emergency funds to augment what they get from government aid and could extend as well to the tourism sector workers if businesses close temporarily. Sources for insurance premiums could include Provincial and Municipal LGU funds, contributions from dive resort owners as well as NGOs keen to support marine conservation.

### Municipal level

Mabini, Batangas, a 1st class municipality with an Internal Revenue Allotment (IRA) of at least PHP 200M, relies heavily on its coastal resources for the livelihood of its registered fisherfolk. As a prime tourism destination, the LGU has established an environmental user fee (EUF) ordinance to fund its Integrated Coastal Management (ICM) program. The EUF generates PHP 13-14M annually from non-diving visitors (PHP 50/day), divers (PHP 200/day), and free-diving enthusiasts (PHP 150/day), with PHP 25M currently accumulated in their trust fund. This fund is earmarked for increasing the number of mooring buoys and demarcation buoys to better manage MPAs such as Batong Buhay, Cathedral, Arthur's Rock, and Twin Rock.

According to municipal representatives, the main issues for their MPAs are garbage management and user conflicts between scuba divers, free-divers, and boat operators. The forthcoming ICM plan, led by Dr. Romy Trono, aims to address these conflicts by designating specific areas for free-diving. To tackle the garbage issues, a new sanitary landfill has been constructed in Buan Municipality. However, interview partners recommend increasing the garbage collection frequency, emphasizing the LGU's financial commitment. Enhanced waste management is crucial for preserving Mabini's marine environment and sustaining its dive tourism industry.

With regards to a potential insurance product for MPAs and fisherfolks, they welcome the idea and they would like to use it to rehabilitate their MPAs starting with deploying demarcation buoys to prevent poaching after a calamity, repairing or purchasing new boats or guardhouses. Mabini relies on passive rehabilitation of damaged coral reefs. For a fisherfolk business interruption insurance, pay-out triggers, they suggested it could be based on the PAGASA Signal no.1 wind warning since then fisherfolks are not allowed to go out to the sea by the Philippine Coast Guard (PCG). They liked the idea that insurance pay-outs could be channelled through an e-wallet such as GCASH for faster disbursement and help is given right away.

### Community level

Fisherfolks and Bantay Dagat members shared that the community has come to appreciate the MPA, after initial doubts and concerns when it was established in 1999. They observe a recovery of some fish populations since then, the end of blast and cyanide fishing and appreciate the new possibilities and alternative income sources linked to tourism. However, they also complain about commercial fishing activities in the area which they perceive as catching too much and indirectly pushing the community folks fishing within the no-take zone as "the empty stomach is speaking".

From a community perspective, the biggest risks to the MPA are man-made hazards such as ocean pollution and garbage, as well as run-off from slash & burn on coastal lands. With regards to natural hazards, reef-destruction from earthquakes as well as impacts from volcanic ash are mentioned, while they

consider "their" coral reefs pretty resilient towards the typhoons in the region.

On the idea of insurance products for the MPA and fisherfolk support, they were very interested because it will really help them a lot. Regarding the pay-out triggers for the fisherfolk insurance, they want it based on the PAGASA Signal no.1 due to PCG's ruling (same as the municipal level suggestion). They really like the idea of the pay-out release via an e-wallet such as GCASH, to receive financial help in a timely manner. The fisherfolks also asked about who will pay for the premium. After discussion, they agreed that they could contribute, but only a small percentage since they don't have enough cash to spend. However, fisherfolks would be fine to earn their insurance through MPA relevant community work such as beach clean-ups and mangrove replanting.

Tourism sector: Mabini, Batangas, renowned for scuba diving, has recently attracted the interest from the free-diving community as well. The tourist high season runs from January to May, while the rainy season from June to December marks the low season. Conflicts arise between scuba divers, free-divers and boat operators, but the forthcoming Integrated Coastal Management (ICM) plan aims to address this through proper delineation of areas for free-diving. Another major concern is the municipality's garbage problem, where plastic and organic waste frequently end up in the sea, reducing the attractiveness to tourists.

Resort owners and dive shop operators actively support conservation initiatives, recognizing the importance of MPAs like Batong Buhay, Cathedral, Arthur's Rock, and Twin Rock, which attract dive tourism. They welcome the concept of MPA insurance and fisherfolk insurance, which would facilitate rapid repairs of MPA infrastructure (guardhouses, demarcation buoys, and boats) following calamities. Typhoons and earthquakes are considered significant threats to reefs and tourism, with the latter observed to cause extensive reef damage. They suggested insurance products could also be designed for protecting hotel and restaurant workers, especially during temporary closure due to a calamity or pandemic. Some business owners are open to co-finance related insurance premium.

## Negros Occidental

Danjugan Island Marine Reserve and Sanctuaries (DIMRS) in Cauayan, Negros Occidental spans 144 hectares, encompassing diverse coastal habitats such as coral reefs, seagrass beds, mangroves, beach forests, lagoons, bat caves, limestone forests, and open sea systems. Managed privately under a co-management agreement with Cauayan LGU, DIMRS includes three special management areas (SMAs) as no-take zones, while the remaining area serves as a buffer zone permitting controlled fishing activities. Key stakeholders include the Philippine Reef and Rainforest Conservation Foundation Inc. (PRRCFI) managing the island and Cauayan's barangay-level LGU, with support from the provincial government of Negros Occidental focusing on initiatives like Bantay Dagat and disaster risk reduction projects.

### Provincial level

Negros Occidental is a First class province with a budget of PHP 5.1B and a NTA of PHP 3.7B/year based on 2023 Commission on Audit (COA) data. The PEMO and PDRRMO are the main bodies managing environmental and disaster risk concerns affecting coastal ecosystems and communities. PEMO leads coastal rehabilitation, notably mangrove tree planting, supported by DENR's National Greening Program. The rehabilitation process starts with a damage assessment, followed by project proposals, which, once approved, are communicated to municipal offices (Municipal Agriculture Office, Municipal Environment and Natural Resources Office) for implementation.

Post-calamity, PEMO and PDRRMO provide immediate aid through a "food bank," offering food packs to affected families for two weeks, with the Department of Social Welfare and Development (DSWD) extending assistance, if need be. Typhoons often damage MPAs in the area, destroying demarcation lines and buoys, leading to potential poaching. Bantay Dagat members, affected by the calamity, are often unable to patrol due to personal losses, creating opportunities for illegal fishing. Latest appraisals indicate a patrol boat costs PHP 1.5M, while a guardhouse is PHP 2M. Ensuring quick recovery and restoring MPA infrastructure is crucial to maintaining protection against illegal activities. As per budgeting, the PDRRMO gets 5% of the NTA and uses 70% of it for mitigation and prevention, while 30% are going into the quick response fund.

The concept of MPA and fisherfolk insurance is welcomed as it promises faster fund release compared to government cycles, crucial for immediate post-calamity recovery. Insurance funds for MPAs could finance the replacement of demarcation lines, buoys, and deploy artificial reefs, like those in Hulao-Hulao reef MPA in Cauayan, which act as wave breakers. For fisherfolk insurance, releasing funds through GCASH offers swift relief. A "cash for work" approach could ensure aid is not seen as a dole-out. Triggers for pay-outs could include typhoon signal number 1 for fisherfolk insurance (as per PCG ruling) and signal number 3 for MPA insurance due to severe impact on coral reefs. Damage assessment reports are seen as integral to the process. On the potential source of funds to pay for the premium, representatives were unsure: different potential funds exist, but requirements to access them are so complicated that in practise these funds are hardly used.

### Municipal level

The Local Government Unit (LGU) of Cauayan, a First class municipality, reported assets totalling PHP 1.4 billion and revenues of PHP 508 million in 2022. The Municipal Disaster Risk Reduction and Management Office (MDRRMO) identified flooding from monsoon rains as the primary hazard, with rare typhoon hits, the latest being Typhoon Odette in December 2021. The municipality oversees four Marine Protected Areas (MPAs), one at Hulao-Hulao reef and three within DIMRS. The MENRO, supported by seven volunteer Bantay Dagat members, manages these MPAs with a limited annual budget of PHP 1.2 million, supplemented by Municipal DRRMO funds.

Insurance familiarity in Cauayan primarily involves the Philippine Crop Insurance Corporation (PCIC), offering property and accident insurance for boats and fishers, with premiums as low as PHP 50 per year for a personal accident policy. Coverage includes PHP 25,000 for finger injuries, PHP 50,000 for arm injuries, and PHP 100,000 for life insurance. Boat insurance, subsidized by the Provincial LGU, covers up to PHP 40,000 for motorized boats and PHP 7,000 for non-motorized boats. While customers consider the benefit amounts as adequate, the usual time from loss to insurance pay-out of roughly three months poses challenges for fishers who live hand-to-mouth. The high cost of registration fees and penalties further discourages many of the 3,000 registered fishers from enrolling.

The LGU welcomes the concept of MPA and fisherfolk insurance, especially with faster fund disbursement through platforms like GCASH. They understand the need for damage assessments for MPA insurance pay-outs but emphasize the importance of promptly replacing demarcation lines and buoys. Suggested triggers for fisherfolk insurance include signal number 1 for pay-out, while MPA insurance would require a higher signal level to justify claims. Potential funding sources for premiums include the provincial LGU, NGOs, BFAR and local contributions, including sweat equity.

### Community level

During the FGDs with Barangay Officials, including the Chairman, councillor, and fisherfolks, it was noted that typhoons are rare in this area, while monsoon winds and rains causing flooding are a significant concern. The councillor highlighted a visitor from Nova (Florida-based University) who assessed Barangay Bulata, identifying overfishing as a primary issue. In consequence, increasing the number of Bantay Dagat was recommended as part of fisheries management solutions.

Regarding insurance for MPAs and fisherfolks, participants expressed interest and inquired about its availability. They emphasized that fisherfolks are crucial beneficiaries and suggested compensating them with PHP 15,000 each for a month if the buffer zone of DIMRS is temporarily closed for marine life recovery. For MPAs, insurance funds would assist in clearing, damage assessment, buoy replacement, spill boom purchases for future oil spills, and conducting Information, Education, and Communication (IEC) campaigns.

Tourism sector: DIMRS in Cauayan, Negros Occidental covers 144 hectares and features diverse coastal habitats, including coral reefs, seagrass beds, mangroves, beach forests, lagoons, bat caves, limestone forests, and open sea systems. Managed by the PRRCFI in collaboration with Cauayan LGU, DIMRS designates three special management areas (SMAs) as no-take zones, while the rest of the area acts as a buffer zone allowing controlled subsistence fishing. Key stakeholders include PRRCFI, Cauayan's barangay-level LGU, and the provincial government of Negros Occidental, which supports initiatives like Bantay Dagat and disaster risk reduction.

Ms. Kaila Ledesma (PRRFCI) supports the idea of MPA and fisherfolk insurance, highlighting its potential to aid recovery after calamities, especially for the fishing community. The island, though rarely hit by typhoons, was impacted by Typhoon Odette (2021), underlining the need for robust disaster recovery mechanisms. They suggest making the insurance innovative and affordable, with incentives after long-term enrolment, such as 10 years. Additionally, PRRFCI proposes developing specific insurance for giant clams (Tridacna gigas) to aid conservation efforts, with proceeds funding hatcheries to produce more clams. Premium funding could potentially be secured through corporate sponsorships.

### Northern Samar

The Biri LaRoSa PA, established through Presidential Proclamation NO. 291, series of 2000, comprises the LGUs of Biri, Lavezares, Rosario, and San Jose in Northern Samar province. Encompassing 33,492 hectares, the PA features diverse coastal habitats including coral reefs, seagrass beds, mangroves, beach forests, and distinctive wind swept rock formations. Regular exposure to typhoons poses significant challenges for the area. Key stakeholders include the four LGUs, the Protected Area Management Office (PAMO), and the DENR Regional Director representing the PA Management Board (PAMB). Additionally, governmental agencies such as BFAR, the provincial government, and sectoral representatives contribute to the PAMB's activities and management efforts.

#### Provincial level

Northern Samar, a Second-class province with 24 municipalities, has total assets of PHP 9B and an income of PHP 1.9B according to 2023 COA data. Key agencies such as the PDRRMO, PPDO, PGENRO, and OPA play significant roles in environmental and disaster risk reduction. The province is home to the Biri LaRoSa PA, covering 33,492 hectares across four municipalities. On average, 10 to15 typhoons affect the province annually from November to March, making PDRRMO's role critical. In addition to typhoons, regular monsoon rains pose a flooding threat. The PDRRMO head noted that their food packs last a week per event, after which they rely on DSWD support. Consequently, they focus on prevention and mitigation through community-based disaster resilience programs in each barangay to raise awareness and reduce risks.

The province, in collaboration with DSWD, has also implemented a "Cash for Training" project targeting coastal communities. This project involves training on mangrove resource management, including nursery development and out-planting activities. Training comprises two days of theory and five days of preparation and planting. Additionally, PCIC provides insurance for farmers and fishers, familiarizing them with such systems.

Regarding MPA and fisherfolk insurance, there is strong interest due to the province's high exposure to natural disasters. However, questions remain about the premium costs and funding sources. Funding could come entirely from the province or national agencies like BFAR, potentially with NGO partnerships. The representatives proposed triggers similar to other sites: typhoon signal no.1 for fisherfolk insurance and higher signal warnings for MPA insurance. Integrating these ideas and approaches into existing plans and justifying insurance expenses to COA is considered necessary before more concrete product development steps.

### Municipal level

Lavezares, a Fourth-class municipality with 26 barangays, has assets totalling PHP 522M and an annual income of PHP 171M. The municipality boasts significant coastal resources, including mangroves, seagrass beds, and coral reefs. The La Laguna Mangrove Eco Park, a 300-hectare park featuring a mangrove boardwalk, is a key attraction. In total, Lavezares has 1,200 hectares of mangroves. However, parts of the mangrove forest were devastated by recent typhoons, necessitating rehabilitation. The MENRO plans to establish a mangrove nursery to ensure a steady supply of seedlings, managed by the community. According to the MAO, funding for such projects typically takes six months from assessment to release.

In order to provide fisherfolks with alternative income sources, some years ago aquaculture, specifically milkfish farming, was promoted. The Municipal Planning and Development Coordinator (MPDC) noted that community projects are prioritized, with habitat rehabilitation as a secondary focus due to limited funds. Funding for habitat rehabilitation is often supplemented by the Municipal Disaster Risk Reduction and Management Office (MDRRMO).

In terms of disaster response, the municipality's food packs last only three days, after which they rely on DSWD's Assistance to Individuals in Crisis Situation (AICS) program for further support. This program provides various forms of assistance, including medical, burial, transportation, education, and food. The municipality also benefits from its collaboration with the PAMB, which supports tourism promotion and infrastructure funding, such as the EcoPark's boardwalk. However, some infrastructure projects have faced resistance due to potential environmental impacts. Lavezares serves as a jump-off point to Biri Island, offering opportunities for local tourism services related to the Biri Rock formation.

The idea of MPA and fisherfolk insurance is welcomed by local officials, who see it as a valuable tool for disaster resilience. The MPDC expressed that such insurance could significantly support the community, especially given the high frequency of typhoons. It could provide rapid financial assistance for habitat rehabilitation and help fisherfolk recover more quickly. The MDRRMO head also suggested expanding the insurance coverage to include disaster responders, who currently lack insurance, indicating a broader interest in comprehensive risk management solutions.

### Community level

Lavezares hosts the Baru Baybay Fish Sanctuary, which was established in 2014 but is inactive since 2018 due to a lack of management and maintenance. Fisherfolk in Lavezares primarily rely on hook-and-line fishing, earning PHP 200-300/day, while those with Payao fish aggregating devices earn PHP 300-500/ day, or up to PHP 1,000 on "lucky days". Payao units cost PHP 20K each. Milkfish pen culture, with a unit cost of PHP 150K, is another source of income, though not all of the initially 50 units are operational due to the high cost of fish feed (PHP 1,000/ sack). Net income from milkfish farming is around PHP 20K per cropping cycle of three months. Many fisherfolk are parttime farmers to supplement their income during the monsoon season from April to November. Seaweed farming also exists but is limited to less exposed areas from March to September with a 45-day cropping period. Illegal compressor fishing remains a major threat, prompting calls for increased Bantay Dagat enforcement and honorariums to encourage patrols.

PCIC operates in Lavezares, though awareness is limited, particularly among those not registered in the MAO fisherfolk database. The MAO reports about 2,000 registered fisherfolk and 300 boats, with annual registration fees of PHP 50 per fisher and PHP 100 per boat. Tourism is an alternative livelihood, with locals working as guides for the La Laguna Mangrove Eco Park. The eco park charges visitors PHP 50 per entry and PHP 3,000 per night for cottage rentals accommodating 10-15 people.

The community welcomes the idea of MPA and fisherfolk insurance, recognizing its potential to provide critical support during calamities, which are frequent. They suggest using the same triggers for pay-outs as other stakeholders: typhoon signal 1 for fisherfolks and typhoon category 3 for MPA management assets. Fisherfolks express their willingness to work on ecosystem rehabilitation projects if they get premium support for insurance.

### Southern Leyte

The MPAs on the twin islands of San Pablo and San Pedro were established in 1999 and 2000, respectively. With 35 and 32 ha, they are relatively small and include coral reefs and seagrass, but no mangroves. There were attempts to establish mangrove forests, but these failed as the area is not suited to this type of ecosystem.

### Provincial level

No interviews were held at the provincial level.

#### Municipal level

Hinunangan is a third-class municipality with 14 coastal barangays. Management and maintenance of Hinunangan's five MPAs effectively falls under the jurisdiction of the MAO, which also provides the largest contribution to the annual budget of PHP 100k for maintenance and monitoring activities. Annual allocations for the 5 MPAs are derived from several sources and budgets: MAO, MENRO, the Office of the Municipal Mayor and BFAR. Request to augment such allocations are sent to BFAR subject also to the Bureau's annual appropriations from the regional office.

The registered fisherfolk population stands at 1,482 for the 14 coastal barangays with 90% registration turn out. The fisherfolks are familiar with the concept of insurance, especially through PCIC products. They have a high appreciation of the concept of insurance and expect to derive significant benefits from it after destructive weather disturbances.

### Community level

The community living on the two islands sustains their livelihood mainly through fishing and have established fisherfolk and farmer organizations. These benefitted from LGU support in terms of infrastructure and community development. Fishing grounds are located off shore to catch high value fish species for subsistence and income generation. The fisherfolks prefer to fish farther from the island since according to observations, the reef does not provide enough fish in terms of size and valuable species. Average fish catch ranges from 3 to 5 kilos. The fish catch is valued at 260-350 pesos per kilo according to a middle man in the island buying the fish directly from fishermen.

Other income generating activities include seasonal seaweed farming and fish-farming in pens, both introduced by BFAR. The community also turns to vegetable farming during monsoons where fishing is not worth the risk. They have grown fruits and some crops for sustenance and a few extra for harvest for small income. Animal raising is also popular among residents in the community but this activity is primarily intended for the coming fiesta of the island. However, during the expectancy of longer fishing bans, most residents of the island cross the mainland to find work in construction business. Working for employers or self-contracting short construction works have provided means to get by the monsoon seasons, storms and low-pressure weather disturbances.

With the assistance of BFAR and the LGU, the community organizations have also successfully formed community savings groups. These provide loans among the members and also run an emergency fund for their members, providing immediate financial assistance during times of hardship. This fund has not yet been used since it was created.

### Tourism sector

Among the twin islands of San Pablo and San Pedro, it is San Pablo Island (Poong gamay) which has established itself more as a tourist destination. The attractive beachline as well as clean and crystal-clear waters are an open invitation to local and foreign visitors. There are twelve registered beach resorts operating in San Pablo. There is not yet any organization representing the resorts and therefore any complaints and concerns are addressed individually. Cottages are the main facilities in these islands for day use. The LGU and the ferry boat cooperative have established a formal scheme for sharing the proceeds of the island ferry business. Tourism peaks during the summer where crossing the islands and the beach activity experiences on the island is pleasant. There is no established carrying capacity as to limit the number of tourists in the island since no significant threats of unregulated waste disposal and coastal habitat degradation are observed.

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