



Public-Private Partnerships (PPPs) for Coral Reef Insurance in Asia and the Pacific

Part I: Project Information

GEF ID

10431

Project Type

MSP

Type of Trust Fund

MTF

CBIT/NGI

CBIT

NGI

Project Title

Public-Private Partnerships (PPPs) for Coral Reef Insurance in Asia and the Pacific

Countries

Regional, Fiji, Indonesia, Philippines, Solomon Islands

Agency(ies)

ADB

Other Executing Partner(s)

Executing Partner Type

Other Executing Partner(s)

Ministry of Environment and Forestry / Ministry of Maritime Affairs and Fisheries (Indonesia);
Ministry of Climate Change and Disaster Management (Solomon Islands); Department of
Environment and Natural Resources (Philippines); Ministry of Waterways and Environment (Fiji)

Executing Partner Type

Government

GEF Focal Area

Climate Change

Taxonomy

Focal Areas, Climate Change, Climate Change Adaptation, Adaptation Tech Transfer, Innovation, Disaster risk management, Community-based adaptation, Climate information, Small Island Developing States, Private sector, Least Developed Countries, Climate resilience, Climate finance, Biodiversity, Financial and Accounting, Payment for Ecosystem Services, Natural Capital Assessment and Accounting, Conservation Trust Funds, Conservation Finance, Biomes, Coral Reefs, Protected Areas and Landscapes, Coastal and Marine Protected Areas, Influencing models, Deploy innovative financial instruments, Stakeholders, Civil Society, Non-Governmental Organization, Academia, Community Based Organization, Type of Engagement, Consultation, Partnership, Participation, Information Dissemination, Local Communities, Private Sector, Large corporations, SMEs, Communications, Behavior change, Awareness Raising, Gender Equality, Gender results areas, Access and control over natural resources, Participation and leadership, Capacity Development, Gender Mainstreaming, Beneficiaries

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 0

Climate Change Adaptation

Climate Change Adaptation 2

Duration

48 In Months

Agency Fee(\$)

121,461

Submission Date

11/26/2019

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCA-1	LDCF	441,400	697,000
CCA-1	SCCF-A	585,997	2,400,000
CCA-3	SCCF-A	251,142	253,000
	Total Project Cost (\$)	1,278,539	3,350,000

B. Indicative Project description summary

Project Objective

To enable large-scale financing to increase the climate resilience of coastal businesses, communities and livelihoods in selected countries in the Asia Pacific region through an innovative public-private partnership (PPP) model for coral reef insurance.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Implement reef insurance model (one site Indonesia)	Technical Assistance	1. Sustainable financing mechanism established and reef insurance product structured at one Indonesian site	1.1 Business case for coral reef insurance prepared for one high-opportunity site 1.2 Enhanced policy, legal and regulatory environment for reef insurance 1.3 Financial mechanism established 1.4 Insurance product for the reef structured 1.5 Increased risk management and post-storm response capacity (as enabling conditions permit)	SCCF -A	532,725	1,100,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Extension of model to the Philippines and Fiji (GEF funds not used for Fiji))	Technical Assistance	2. Regional and site level assessments and post-storm response capacity enhanced for 2 additional participating countries (Fiji not included under GEF funds)	<p>2.1 Regional assessment of damage to reef correlation for typhoons and tsunami</p> <p>2.2 At least two site level assessments and data profiles prepared (one in each country)</p> <p>2.3 Reef protection value assessed for one site in Philippines</p> <p>2.4 Increased risk management and post-storm response capacity at one site in each of 2 countries (as enabling conditions permit)</p>	SCCF -A	200,310	1,300,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Extension of the model to the Solomon Islands	Technical Assistance	2. Site level assessments and post-storm response capacity enhanced for Solomon Islands	<p>2.1 Assessments of damage to coral reefs correlation for typhoons and tsunami.</p> <p>2.2 Site level assessment and data profiles prepared for one site.</p> <p>2.3 Increased risk management and post-storm response capacity at one site (as enabling conditions permit).</p>	LDC F	321,273	350,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Knowledge and monitoring approaches enhanced	Technical Assistance	3. Improved awareness by regional, national and local stakeholders of the benefits provided by coral reef ecosystems, and the protective services to coastal businesses and livelihoods. (Focus on Pacific SIDs)	<p>3.1 Toolkit that provides guidance for developing a business case to assess and demonstrate the need for natural capital-based insurance.</p> <p>3.2 Audience-segmented knowledge and communications materials developed and disseminated.</p> <p>3.3 Monitoring and evaluation conducted.</p>	LDC F	80,000	264,000

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)	
Knowledge and monitoring approaches enhanced	Technical Assistance	3. Improved awareness by regional, national and local stakeholders of the benefits provided by coral reef ecosystems and their protective services to coastal businesses and livelihoods	3.1 Toolkit that provides guidance for developing a business case to assess and demonstrate the need for natural capital-based insurance. 3.2 Audience segmented knowledge and communications materials developed and disseminated. 3.3 Monitoring and evaluation conducted.	SCCF -A	28,000	170,000	
Sub Total (\$)					1,162,308	3,184,000	
Project Management Cost (PMC)							
					SCCF-A	76,104	83,000
					LDCF	40,127	83,000
Sub Total(\$)					116,231	166,000	
Total Project Cost(\$)					1,278,539	3,350,000	

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
GEF Agency	Asian Development Bank	Grant	Investment mobilized	3,200,000
GEF Agency	United Nations Development Programme (UNDP)	In-kind	Recurrent expenditures	150,000
			Total Project Cost(\$)	3,350,000

Describe how any "Investment Mobilized" was identified

Included in the ADB pipeline under the Asia Pacific Climate Finance Fund (ACliFF).

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
ADB	SCCF-A	Regional	Climate Change	NA	837,139	79,528	916,667
ADB	LDCF	Regional	Climate Change	NA	441,400	41,933	483,333
Total GEF Resources(\$)					1,278,539	121,461	1,400,000

Core Indicators

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

The project will report against the LDCF/ SCCF Results Framework

Part II. Project Justification

1a. Project Description

Adaptation problems, root causes and barriers

1.1 Adaptation problems

Climate change threats to coastal businesses, communities and livelihoods:

Tropical cyclones are a natural part of our climate system, but research suggests that climate change may result in more intense events in the future. In coastal areas, rising sea levels make the risk of storm surges and high tides greater. Approximately 40 percent of the world's population lives within 100 km (60 miles) of the coast^[1]¹, making sea level rise and flooding from more frequent, intense storms among the major climate-related risks to these coastal communities.

Coral reefs play a cost-effective role in reducing coastal erosion and flooding from storms and sea-level rise, providing significant coastal protection benefits to people and property. Healthy coral reefs break-up as much as 97% of wave energy before a wave reaches the shore, dramatically reducing flooding and beach erosion in coastal communities that sit behind the reefs. Under this project, we proposed to focus on four countries that are highly susceptible to disasters from an ecological and socioeconomic perspective and where reefs may provide critical protective services.

One study^[2]² shows how, for a 100-year storm event, coral reefs are estimated to provide the following level of protection (a magnitude significantly accentuated in middle income countries in terms of dollar value versus the SIDS):

- Indonesia: protection for 1.8 million people, \$36 billion^[3]³ in built capital, and an area of 2,837 square kilometers.
 - Philippines: protection for 2.4 million people, \$31 billion in built capital, and an area of 2,678 square kilometers.
 - Solomon Islands: 3,091 people, \$52 million in built capital, and an area of 16.6 square kilometers
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- Fiji: 2,830 people, \$48.9 million in built capital and an area of 72.5 square kilometers.

On an annual basis, expected flood protection benefits provided by coral reefs -- in terms of averted damage to built capital – are as follows[4]⁴:

- Indonesia: approximately \$639 million in averted damages to built capital
- Philippines: approximately \$590 million in averted damages to built capital
- Solomon Islands: \$538,546 in averted damages to built capital
- Fiji: \$412,239 in averted damages to built capital

Healthy coral reefs also provide other important ecosystem services to coastal communities around the world; the value of services they provide globally has been estimated at as much as \$9.9 trillion[5]⁵. For example, the coral reef tourism sector has an estimated annual value of \$36 billion, with over 30% of the world’s reefs providing value for tourism. Over 350 million people annually travel to the coral reef coasts of the world, and over 70 countries and territories – including Indonesia -- have “million dollar reefs” — reefs that generate over \$1 million in tourism spending annually. The annual value of coral reef-associated visitor expenditures is estimated as follows for each of the four countries[6]⁶:

- Indonesia: \$3,097,453,000 (for example, foreign tourists visiting Bali spend an average of US\$125.93 per day and stay an average of 8.66 days)
- Philippines: \$1,385,144,000 (the average daily expenditure and the average length of stay per tourist reached 120.60 U.S. dollars and 9.01 nights in 2018)
- Fiji: \$234,676,000 (for a midrange trip, tourists spend FJD\$ 360-800 or US\$155 to 345 per day)
- Solomon Islands: \$21,984,000 (13 night stay on average by tourists and a spend of \$207 per night for those on holiday).

While tourism in many coastal areas is worth billions of dollars, beach erosion is a mounting problem for the tourism industry. Past storm events have closed hotels and businesses for long periods, cutting off income and local employment until they can be repaired and reopened. In Indonesia, a global tourism hotspot, the value of annual reef-associated tourism expenditures in the country is just over \$3 billion. The tourism sector depends on local community members, often of low or middle income, to deliver services on a daily

basis. These people cannot get to work or support their families if infrastructure and businesses are disrupted by a natural disaster. Coral reef health and functioning is very important for local economies that are heavily reliant on tourism, and particularly for community members whose livelihoods depend on fishing. If a reef's coral cover is severely damaged by a cyclone, reef-based tourism would be impacted, as healthy corals and diverse sea life are the main attraction for diving and snorkeling.

Healthy and well-managed coral reefs generate five to ten tons of fish per square kilometer per year. In the Indo-Pacific region, there are approximately 1,800 species of coral reef fish[7]⁷.

An estimated 1.2 billion people in Asia depend on reef fish for 25% of their protein requirements. More than a third of the Indonesian population (± 80 million people) lives in coastal areas and is dependent on nearshore fisheries for livelihoods[8]⁸, for which coral reef health and functioning is a critical factor. Fisheries in Indonesia also contribute significantly to the national economy, trade, and employment; marine capture fisheries have been valued at \$14 billion and coastal and marine aquaculture at \$7 billion[9]⁹. Coastal fisheries are negatively impacted by overfishing and destructive fishing, coastal development, and marine-based pollution[10]¹⁰.

It is worth noting that, throughout the region covered by this project, tsunamis are also a major risk. Research suggests that reefs, depending on length, width of gaps, water depth, and other factors, may play an important role in reducing the impact of tsunamis. It is recognized that tsunami risk is more associated with earthquake than climate change. As such the GEF funds will not be used for this purpose – however this risk may be included in the overall insurance protection.

Indonesia

Indonesia's coral reefs are some of the most extensive on the planet, covering approximately 39,538 square kilometers[11]¹¹ and representing 16% of the world's coral reefs – second only to Australia[12]¹². Based on percent of live coral cover, 36.18% of Indonesia's reefs are in poor condition, 34.3% are in fair condition, 22.96% are in good condition, and only 6.56% are in excellent condition. Almost 60 million people live within 30 km of a reef¹¹. There are 82,190 villages, with approximately 60% percent of the population, living within 60 km of the coast[13]¹³. Of these, 59,458 villages (72.34%) have been found to be vulnerable to climate impacts capable of degrading coral reefs[14]¹⁴.

Here, coral reefs are also threatened by tropical cyclones, tsunamis, and local human activities (e.g. destructive fishing practices). The presence of tropical cyclones (outside Indonesia) can trigger the occurrence of strong winds, higher tides and intense rainfall, which can in turn lead to flooding and coastal erosion. Flooding and coastal erosion from intense storms and extreme sea waves are growing problems. Destructive fishing (blast of poison fishing) is widespread and threatens nearly 80% of Indonesia's reefs (about

31,000 km²)[15]¹⁵. Coral reefs in Eastern Indonesia (e.g. Sulawesi, Maluku, and Papua Islands) are highly impacted by this threat, while provinces in Kalimantan and Sumatra Islands are less exposed[16]¹⁶.

Although there is no comprehensive study to date, the fast-growing marine tourism sector has been widely recognized as posing a major threat to the integrity of coral reef ecosystems, particularly mass tourism that occurs in many major coastal areas, as well as in small island conservation sites. To address situation, the Indonesian government plans to impose high entrance fees on some critical locations, such as the \$1,000 entrance fee for Komodo Island[17]¹⁷, to help reduce this threat.

Philippines:

The Philippines has an estimated 22,484 square kilometers of coral reefs, representing 9% of the world's reefs. Over 41 million people live within 30 km of a reef¹¹. The Philippines is ranked third among the countries in the world most vulnerable to climate change, a recent survey by HSBC showed. Climate change and overfishing have led to coral degradation and declining fish stocks, causing environmental damage and challenging livelihoods for the ~6 million small-scale fishers and their families who rely on coastal waters for income and sustenance.

The Philippines is particularly vulnerable to natural hazards because it lies along the Pacific Typhoon Belt and is within the Pacific Ring of Fire. It is ranked third in the world among countries most prone to disasters, and in second for cyclones (it experiences more than 20 cyclones each year), landslides, earthquakes and tsunami. It is ranked 8th in the world for flooding and 33rd for drought. According to a 2012 ADB study, 85% of the country's economy is vulnerable to natural disasters, and these disasters cost the country an estimated US\$3.5 billion per year in asset losses. Since 1990, it has been affected by 565 natural disaster events that have claimed the lives of nearly 70,000 Filipinos. It is abundantly clear that the Philippines must place climate adaptation and resilience at the heart of its development strategies.

An increasing share of the Philippines' poor and vulnerable inhabitants are earning their livelihoods in coastal industries, particularly tourism, fishing and agriculture. The share of employment in tourism industries relative to total employment in the country was 13% in 2018, rising in line with the share of GDP from tourism; the contribution of tourism to the Philippine economy was also nearly 13% in 2018, growing year-on-year, and driven largely by coastal tourism. To reduce the vulnerability of these communities and ecosystems while balancing the need for a sustainable tourism sector, the country faces an urgent need for specialized insurance market development to support coastal resilience.

The HSBC Fragile Planet assessment of 2018 ranked the Philippines third globally in terms of vulnerability to climate disasters and highest (number 1 globally) in terms of sensitivity to extreme events, including livelihood disruptions, based on the extensive coastlines exposed to typhoons, poor populations, and inadequate infrastructure. Of the world's top ten cities most exposed to natural hazards, eight are in the Philippines. Natural capital, which is abundant in many areas with significant assets and population, can mitigate this vulnerability through both protection and long-term resilience: a healthy coral reef can, for example, absorb up to 97% of a wave's energy before it hits the shore,

putting it on par with some more expensive, carbon intensive and typically less durable man-made protections such as breakwaters. The reef insurance approach addresses natural, physical and societal vulnerabilities in a holistic manner.

Solomon Islands:

The Solomon Islands have coral reefs covering an estimated 6,743 square kilometers, representing about 3% of the world's coral reefs. Here, tropical cyclones cause flooding and wind damage and pose a serious threat to the people, economy and environment of the country. In 2002, the remote island of Tikopia was hit by a Category 5 cyclone (Zoe), resulting in severe damage to the local environment, agriculture and community productivity. While projections tend to show a decrease in the frequency of tropical cyclones by the late 21st century, they show an increase in the proportion of the more intense storms.

About 540,000 people live within 30 km of a coral reef. The vast majority of the Solomon Islands falls under customary tenure and is owned by the local communities. As such, the focus of the Solomon Islands Government has been on supporting community-based resource management (CBRM), including community-based vulnerability mapping, adaptation planning and management approaches, and where possible, facilitating direct access to financing for community-based resilience-building projects. The introduction of any reef insurance model would acknowledge and accommodate this governance context.

Fiji: *{GEF funds will not be used to support activities in Fiji}*

Fiji's coral reefs cover an estimated 6,704 square kilometers, representing about 3% of the world's coral reefs. While Fiji's coastal and marine ecosystems contain significant biodiversity, much is under threat. There is evidence that increased storms and cyclone intensity can cause local breakage of corals on shallow reefs^[18]. Analysis following Tropical Winston suggested that native forests, mangroves, and coral reefs are expected to take at least 10-15 years to deliver the same quality of ecosystem services than before the cyclone if structural restoration is undertaken and assuming no additional pressures from development activities (GoF, 2016). The loss of coral reefs results in greater wave energy reaching shorelines and reduced sediment production, which in turn increases coastal erosion (IGCI, 2000). It has been estimated that for Viti Levu alone, projected costs of climate change impact on coral reefs would reach US\$5-\$14 million annually by 2050 (World Bank, 2000).

In addition, much of Fiji's infrastructure is situated in coastal and flood plain areas, rendering it vulnerable to a range of hazards expected to increase in frequency and severity with climate change, such as sea level rise, salt intrusion, tidal surges, flooding and coastal erosion (World Bank, 2000; IGCI, 2000; GoF, 2017). The cost of damage and losses to infrastructure from 2016's Tropical Cyclone Winston alone was estimated at approximately \$113.3 million, while damage to the natural environment was estimated at \$410.2 million.

Approximately 690,000 people live within 30 km of a coral reef¹¹. Tourism is particularly important to Fiji's economy; approximately 40% of Fiji's GDP and employment can be traced some to the tourism sector. As Fiji's largest income earner, the economic benefits of intact ecosystems to the tourism sector is critical.

1.2 Root Causes

Threats to coral reefs and their protective services:

Threats to reefs: Coral reefs ecosystems around the world are highly threatened and need innovative solutions to reverse their decline. They are degrading because of pollution, disease, and overfishing -- and climate change which, through warming oceans, sea level rise, altered ocean currents and increasing acidification, threatens to impact them faster than their capacity to recover. Damage from severe climatic events such as tropical cyclones (depending on the region, known as hurricanes, typhoons, cyclones) poses a significant threat to coral reef ecosystems. Such events can cause heavy damage to coral reefs by breaking and uprooting coral colonies, collapsing structures, reducing crest height and rugosity and eliminating live coral cover. One study[19]¹⁹ found that coral reefs lose an average of 25% of live coral cover after winds with 110 knots (category 4 hurricanes) and up to 60% with winds above 160 knots (approximately a category 5 hurricane). In some regions, damage from tropical cyclones is the greatest short-term risk that reefs face, with windspeeds of 35[20]²⁰ - 160 knots leading to 20-50% loss of live coral. The biodiversity value and ecosystem services provided by a coral reef would be diminished after being impacted by hurricanes with wind speeds above 110 knots. If the frequency of the most severe tropical storms increases under climate change, corals will have even less ability to repair themselves sufficiently to provide protection services.

Threats to reefs' protective services: Thus, while the friction that reefs exert on incoming waves diminishes wave energy and reduces coastal flooding, it can also cause damage to the reef, impacting ecological function and coastal protection during subsequent storms. The loss of the top one meter of a healthy reef can double onshore financial damage and significantly increase the number of people impacted by coastal flooding when severe weather strikes again. Notably, there is evidence of coastline damage and beach erosion corresponding to areas of reef loss.

In the face of a wide range of threats, reef self-recovery is increasingly difficult and innovative solutions are needed to stop and reverse their decline. Funding and technical capacity are needed for continuous actions to tackle the multiple risks facing reefs, and to manage less frequent but severe risks such as typhoons and tsunamis.

1.3 Barriers

Damage to coral reefs by severe climatic events can be reduced by immediate post-storm cleanup and restoration actions. However, in spite of the benefits that coral reefs provide, coastal businesses and local governments have not invested in reef restoration and conservation -- putting their protective services at risk. There are several reasons for this:

1. There is a lack of convincing data on the coastal resilience benefits provided by adjacent coral reefs and the economic value of such benefits – the business case for investing in reef repair/restoration and maintenance: governments and coastal businesses are unfamiliar with the vital and cost-effective role that reefs play in protecting property and people.
 2. There is a lack of data, quantified or anecdotal, on vulnerable local populations—how they benefit from the reefs indirectly and directly and particularly how there is an outsized impact on women when disasters strike and reefs are damaged.
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3. Governments and coastal businesses are not familiar with the concept of nature-based risk transfer or the potential to protect coral reefs through financial mechanisms.
4. Governments do not have legal frameworks or institutional structures in place to insure a reef as an asset; hence, the insurance and re-insurance industry are not able to offer coastal resilience insurance products.
5. Local governments and coastal communities may lack the technical expertise, capacity and resources to repair and maintain coral reefs.

Insurance barriers:

1. Lack of vision in the insurance industry for the potential of natural systems to reduce losses and to represent a growth market for insurance products.
2. Insurance penetration in these coastal communities is low more generally, and there is often a lack of insurance products (sell side) and low demand for them (buy side); this prevents uptake of this basic risk transfer mechanism, and hence there are few financial offerings that enhance resilience and reduce vulnerability.

2) Baseline Scenario and any associated baseline projects

Insurance:

Public-sector interest in utilizing insurance mechanisms as part of a holistic risk management package to protect budgets and hard-won development gains has risen dramatically in recent years. However, the public sector has not been considered a traditional customer of the insurance industry until relatively recently. This is beginning to change. The UNFCCC Paris Agreement recognized the role of risk transfer as a climate adaptation strategy. A number of initiatives, including those supported by UNDP, have contributed to building capacity of developing countries to identify and implement strategies supporting risk transfer, insurance and natural capital management, and connecting governments with the private sector to create measurable impact.

The German government launched the **InsuResilience** partnership through their G7 and G20 presidencies to help bring climate-risk insurance solutions to 400 million vulnerable people worldwide. This commitment was extended to 500 million at the UN Climate Summit in September 2019. The German government has

expressed strong interest in the insurance for nature concept in the Asia Pacific and Caribbean regions. This programming is closely aligned with the InsuResilience Solutions Fund, particularly as this work is targeting poor and highly vulnerable communities who lack insurance solutions as safety nets or protective measures.

The **Insurance Development Forum (IDF)** - a collaboration between multilateral organizations and the insurance industry co-chaired by UNDP and supported by TNC - is focused on providing resilience solutions through risk assessment, reduction and transfer for vulnerable countries. Insurance industry members of the IDF are working with TNC to develop the “insurance for nature” concept. Many of the key potential insurance providers of the Reef2Resilience initiative (which is a programme to take reef insurance to twenty countries building on the Mexico case) are already partners within the IDF.

ORRAA: The Ocean Risk and Resilience Action Alliance, co-founded by TNC and UNDP, is a multi-sector collaboration designed to drive investment into coastal natural capital by pioneering ground-breaking finance products that incentivize blended finance and private investment. Building resilient natural infrastructure requires investment from a combination of private, government, philanthropic and development finance. Yet perceived risks, underdeveloped finance vehicles and the lack of a pipeline of products have restricted significant investment, and ORRAA steps in to address these barriers.

These initiatives recognize the growing interest by the insurance industry that serving the public sector represents a significant new potential market. With approximately 75% of the global population not covered by insurance, the industry needs to work with the public sector and civil society to address this situation.

This environment provides a valuable opportunity for new forms of insurance, including insurance for nature, to become established over time. However, these initiatives are not prioritizing the use of nature-based solutions to promote coastal resilience. The proposed GEF project will significantly increase the likelihood of widespread uptake of the reef insurance model or other nature-based sustainable finance mechanisms and help generate the global environmental benefits associated with such approaches (such as restoration and conservation of coral reefs or other coastal ecosystems).

Insurance for nature complements other initiatives that are designed to support natural systems and the communities that depend on them. An increasing amount of investment is being deployed to manage, protect and restore ecosystems and the services they provide. However, these ecosystems are at risk from multiple factors, including catastrophic damage by typhoons and tsunamis. The insurance model we propose helps to lock in investments that are being made to conserve coral reefs. If these investments are lost because of a major shock event, such as a typhoon, the insurance is designed to pay out to finance the repair to the damage. This provides a large amount of capital that might otherwise not be available due to other pressing priorities that follow a natural disaster. Equally, by having funds to repair substantial damage caused to a reef ecosystem, communities whose livelihoods depend on it, such as fishermen and local tourist operators, will benefit too.

External financing from MDBs, UN Technical Agencies and International Conservation Organizations:

ADB, UNDP, TNC and the GEF, are core members of the Development Partners (DPs) group of the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF), which includes Indonesia, Philippines and Solomon Islands (along with Malaysia, Timor Leste and Papua New Guinea). All DPs have invested considerable resources to address the overarching goals of the Regional and National Plans of Action under the CTI-CFF. Notably, these include technical assistance related to strengthening marine protected areas (MPAs) and networks of MPAs, developing management plans for seascape level ecosystems, advancing ecosystem-based approaches to fisheries management and improving capacity of countries to address risks associated with climate change and variability. A stock take of programs and projects undertaken in 2015 estimated that around USD 576 million in financing for CTI-CFF was committed directly through ADB, UNDP, FAO and World Bank.^{[21]²¹}

The GEF project will build on two Regional Technical Assistance (RETAs) implemented by ADB on: “

Strengthening Coastal and Marine Resource Management in the Coral Triangle: Southeast Asia” and “Strengthening Coastal and Marine Resources Management in the Coral Triangle of the Pacific” - which covered all four countries under this GEF project. Both projects advanced capacity development with respect to improving the management effectiveness of marine protected areas and large seascapes. One tool developed and internalized (adapted) across these countries is the MPA management effectiveness assessment tool (MPA MEAT), which is a rating or scoring method used as a guide to improve management effectiveness of protected areas, most of which are coral reefs. The tool will be applied in all the project sites, as a way of determining benchmarks and thresholds.

In Indonesia the GEF project will align with the ongoing investments of MMAF to achieve and maintain 20 million hectares of MPAs which will be done through the annual national budget allocation process. For 2019-2021 the MMAF has committed \$16.42 million to help meet their national targets of effective MPA management. In the Philippines the project will be associated with the proposed Coastal Resilience Initiative (CRI) for the Eastern Seaboard project which will address the climate change related needs of approximately 51 million people (27M males and 24 M females) within the 28 most climate vulnerable provinces in 8 regions of the country. These areas also contain the critically remaining coastal resource base of the country, particularly its mangrove ecosystem, which fuels its agriculture and green industries but are climate vulnerable. Approximately 600,000 fisher folks and an undetermined number of farmers are dependent on these resources for subsistence and livelihood. Total project funding of around \$ 200 million is anticipated, although the project will focus primarily on mangrove ecosystems.[22]²²

ADB is in discussions with the Government of Indonesia on a blended finance initiative, which would deploy innovative financial tools to drive investments in coastal fisheries and restore marine biodiversity. This type of facility aligns the Indonesian SDG One Platform (part of which focusses on SDG 14) with the new ADB Action Plan for Healthy Oceans and Sustainable Blue Economies, and will provide opportunities to conceptualize, design and prepare a new generation of investment projects in sectors related to integrated river basin and coastal management. Similarly, UNDP is working with the Indonesia Coordinating Ministry on Marine Affairs (CMMA) to develop a Blue Financial Instrument Framework (BFIF), which aims to support the attainment for the Sustainable Development Goals (SDGs), more specifically SDG 14. The facility will also feature investment catalyzing activities to address marine resources issues in line with principles of blue financing.

ADB's water programs in the Pacific SIDS typically support, among other things; i) improvements to flood control, ii) basic climate proofing of water and sanitation infrastructure, iii) hydrological assessments, iv) reviewing and strengthening governance, policy reform and preparation of water safety plans etc. In the Solomon Islands, ADB has contributed to operational planning framework - Solomon Water 30 Year Strategic Plan, 2017 – 2047. This Plan, prepared in support of the Solomon Islands Water Authority[23]²³ (SW), aims specifically to help implementation of SW's vision, and given rise to a proposed loan on Urban Water Supply and Sanitation Sector Project (UWSSSP) for around \$ 71 million with proposed financial support from the government of Solomon Islands, the EU, and the World Bank as well as ADB. A recently approved LDCF project in Solomon Islands will be linked to this investment, and will, inter alia, focus on demonstrating /deploying climate resilient urban services: water supply, sanitation and disaster reduction.[24]²⁴ The implication is that this type of investment will contribute to improved ecosystem health, as well as climate-proofing of water resources

management and related infrastructure. In Fiji, ADB is supporting technical assistance to prepare a larger loan project to improve Nadi River flood control and watershed management capacity and infrastructure to address climate risks and exposure to external shocks.

Co-financing:

The project aims to be co-financed for roughly USD \$ 3.2 million, directly by the ADB Asia Pacific Climate Finance Fund (ACliFF).[25]²⁵ The ACliFF identifies and pilots innovative, scalable and commercially viable financial risk management products in conjunction with development projects which support climate change mitigation and adaptation. ACliFF is configured to identify and support the implementation of innovative

approaches, products and services that directly address:

Climate investment risk – including barriers for adopters and financiers, such as lack of familiarity with climate technologies, quality concerns regarding installation and maintenance, and other performance-related uncertainties, which may be addressed with guarantees, insurance, or other risk sharing facilities, and

Extreme weather risk – improving resilience and reducing vulnerability to climate impacts, particularly of poor and vulnerable communities, including through index-based flood or drought crop insurance, disaster risk insurance for microfinance institutions, and emergency liquidity facilities.

The ACliFF funding will be used to directly support this initiative under the same title. It is subject to a parallel approval process which requires proposal submission and review by a steering committee which consists of multiple donor organizations – with ADB as the Trustee. This process is ongoing.

The project will also benefit from co-financing from UNDP for preliminary data gathering and scoping activities in Indonesia and the Philippines. As part of UNDP’s growing work in natural capital and specifically the blue economy, UNDP has invested and will continue to do so in developing enabling factors around the types of opportunities identified in this PIF. Part of this is through Indonesia- and Philippines- specific vulnerability identification and coastal resilience data, as well as through the development of a multipartner Coral Reef Fund, whose expertise and potential financial resources can be leveraged for the work included herewith. Finally, UNDP’s work on blue economy and blue bonds has meant increasing government engagements to source opportunities for investing in marine conservation measures that municipal, local and regional state governments are in favor of to better balance their own fiscal measures with conservation and adaptation needs.

During project preparation, further co-financing will be sought from: i) other ADB and donor funds, ii) contributions from various Project Executing Entities (identified in Part 1). Discussions are also ongoing with the IDF and ORRAA to explore co-financing options from the insurance industry.

Proposed alternative scenario

Damage to coral reefs by severe climatic events can be repaired by immediate post-storm cleanup and further restoration actions on the reef over time. It is important that repairs be undertaken quickly in order to maximize their effectiveness and minimize long-term damage. Teams of people from the local community, or “reef brigades”, can be trained to go onto the reef after a severe storm to assess the damage, remove debris, carry out initial repairs, collect broken coral for future reattachment and design a repair strategy.

However, to be successful, funds are needed quickly to finance the work. Insurance can provide this funding. A dedicated insurance solution to cover the reef brigades and repair costs is essential if the full protective value of the reef is to be reinstated more quickly than the natural repair process. The reef insurance model, which uses parametric insurance designed for quick pay-out after a triggering event, responds to this need and provides payment to first responder teams and for longer-term repairs[26]²⁶. This can have a measurable impact on reducing the socioeconomic vulnerability of local communities, which can be quantified.

What are some of the advantages of parametric insurance? This type of product is considered to have relatively fast payout - 10-14 days from event - which is essential because the reef recovery process must start as soon as possible to avoid further damage to the reef and maximize the chances of a strong recovery. Insurance pricing is usually based on historical loss records. In the project countries, there are no such records existing, or readily available, for reef insurance since the concept is brand new. To work around this, parametrics offer an attractive alternative. Instead of loss history they use other such data as windspeed, temperature etc. for which there is existing 100 year data. In cases such as the Caribbean Catastrophe Risk Insurance Facility, parametric insurance, because of the fast payout, acts as contingency/liquidity funding after an event. Based on prior experience in Solomon Islands, it will be important to set thresholds and indices for payout carefully to ensure that if damage occurs, the insurance actually pays out.

How will this apply to “loss and damage – slow onset events”? Climate change impacts that are permanent and irreversible are categorised as loss, while damage refers to impacts where reparation or restoration is possible. Loss and damage can be caused by:

Slow onset events, such as sea level rise, ocean acidification, increasing temperatures and desertification, loss of biodiversity, land and forest degradation, and salinization.

Extreme events, such as tropical storms, landslides, flooding and heatwaves.

Loss and damage can be further categorised as:

Economic impairment to goods and services that are traded in markets and can thus be quantified and priced. Examples include damage to infrastructure/assets, disruption of economic activities and livelihoods, decreased agricultural and fisheries production, decreased provision of goods and services (e.g. tourism).

Non-economic impairment to things that are generally not traded in markets and are thus difficult to quantify or price. Examples include loss of life, detrimental health effects, displacement and migration of communities, loss of terrestrial territory, decreased biodiversity, decreased ecosystem services, loss of indigenous knowledge, loss of cultural heritage, loss of sense of place, decreased social cohesion.[27]²⁷

These principles will be considered in project activities which seek to structure insurance products in project areas. Reference Annex E.

The coral reef insurance model: background

The project will build on the learning generated through a pilot initiative in Quintana Roo, Mexico, where the world's first insurance policy for a coral reef was purchased in June 2019. Here, The Nature Conservancy (TNC), Swiss Re, the government of Quintana Roo and the local hotel industry have partnered to insure a stretch of the Mesoamerican Reef and adjacent beaches to protect coastal businesses and thousands of livelihoods dependent on tourism and fishing.

Underlying the success of the model is an innovative financial mechanism developed to promote good governance, increase transparency, and ensure that the insurance policy is properly funded: the Coastal Zone Management Trust. The Trust was established in November 2018 and has purchased a reef insurance policy. The Trust is governed by a technical committee that includes government officials, representatives from the hotel association and non-governmental organizations (including TNC). The Trust will receive revenues from a tourism tax collected by the government from hotel owners and other beachfront property owners to be used, in part, to pay the insurance policy premiums, and to conduct overall management of the coastal zone—ensuring funding both during disaster response and for ongoing reef and beach maintenance (see Annex D). The Trust also has a science committee that proposes reef and beach maintenance activities before and after a storm event. Based on the experience in Mexico, the process of putting in place climate risk insurance includes six key steps spanning technical, legal, financial and direct implementation aspects. They consist of:



Under this proposed project, this model will be expanded by collecting and modeling socioeconomic considerations and community vulnerability ex-ante to better include adaptation and risk reduction considerations.

Candidate sites in Asia and the Pacific:

A global analysis of coastal protection values of coral reefs^[28] reveals a wide range of countries where coral reef insurance markets might be feasible, including multiple countries in the Asia Pacific region. Specifically, the analysis points to Indonesia and the Philippines as two countries that are highly vulnerable, have reefs and where there is the

greatest benefit from their presence in terms of the number of people protected and the value of property protected by coral reefs. Indonesia was ranked first in terms of annual expected flood protection benefits from coral reefs. Other countries, such as Fiji and the Solomon Islands, have vulnerable populations who are similarly at risk, depend on reefs for livelihoods and benefit economically from the protection they provide. Particularly prone to extreme events and flooding with their extensive coastlines, these countries face greater requirements for building resilience.

During project preparation and into early implementation, the project proponents will conduct analyses that integrate ecological data on where coral reefs provide protective services with basic socioeconomic, political and market data for candidate sites in the four countries. Part of this work is already being assumed in-house by UNDP who has invested in the development, collection and analysis of data on socioeconomics, insurance, vulnerability, and coastal infrastructure and disasters. Through a new in-house data and AI capability, this data will be combed through to better inform the feasibility phase. The ecological data collection and analysis will include the value of built capital protected, number of people protected, and area protected by a coral reef; it will also consider reef-based tourism and fisheries values. Livelihoods linked to the protective services provided by reefs will be mapped, and insurance market data such as insurance penetration rates will be reviewed.

This will allow for an understanding, at a basic level, of the people, property and livelihoods being protected at candidate sites, the potential uptake for insurance, and the local government capacity and support for an insurance product. Considering these factors will allow the teams to identify a preliminary set of candidate sites where it may be possible to replicate / adapt the Mexico model, pending more detailed analyses.

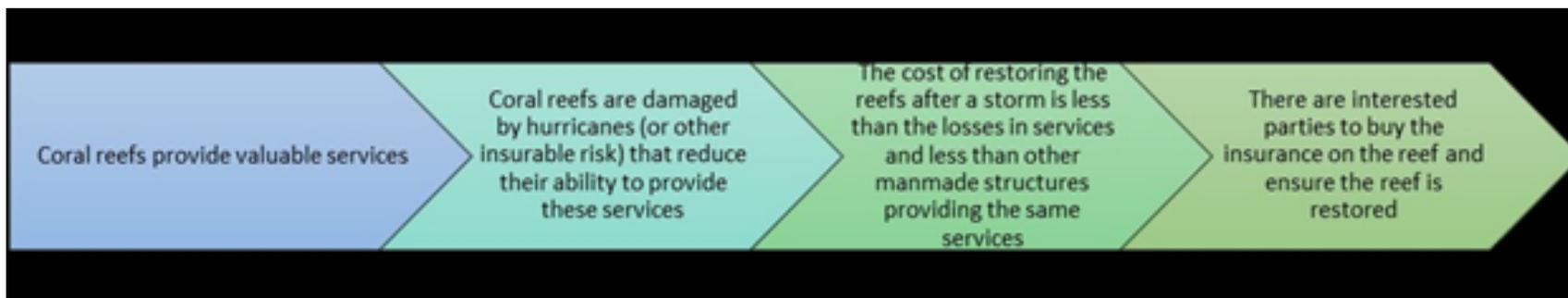
The project will also undertake a more in-depth analysis of data for candidate sites in Indonesia during project preparation. This reflects existing interest by the Government of Indonesia in the reef insurance model, as expressed in discussions that have already taken place with Indonesian officials. For these sites, the project proponents will engage with local stakeholders to undertake a more detailed assessment of relevant enabling conditions, such as:

- Coral condition
- Vulnerability based on socioeconomic criteria
- Insurance penetration and understanding/receptiveness to insurance products
- Environmental services provided for local economies, including tourism and or fisheries businesses, as a result of existing healthy coral ecosystem;
- Willingness to pay by business sectors and/or government agencies to protect the coral reef.

It will be essential for site level actions, to assess the broader risk landscape facing the reef. The insurance approach is best suited for catastrophic events. However, other types of risk could be envisaged and addressed through different means. For example, with sufficient funding, the underlying financing mechanism might invest in measures to address risks for which the insurance is less relevant (education on sustainable coral harvesting), agricultural practice (reduce nutrient run-off) etc.

Criteria for candidate sites:

Sites with high potential for reef insurance should meet the following conditions



Indonesia:

In Indonesia, potential candidate sites are located in Derawan, Wakatobi, Rote, Gili Terawangan (in Lombok West Nusa Tenggara), Nusa Lembongan in Bali, 1000 islands in Jakarta (coastal and islands), Mandalika in West Nusa Tenggara (coastal), and Tanjung Putting in Banten (coastal). These areas contain some of the world's best coral cover and highest marine biodiversity, and are located in areas prone to tsunami and unusually large sea swells (high waves):

1. Derawan Island communities' livelihoods are heavily dependent on coastal fisheries which rely on healthy coral reef ecosystems.
2. Wakatobi District's main incomes sources include marine tourism along with fisheries and mariculture.
3. Rote District, similar to Wakatobi, is heavily dependent on healthy coral reefs; its major livelihoods include mariculture (seaweed), coastal fishery, and marine tourism.
4. Gili has good coral cover and high tourism industry. It includes the 30km² Gili Matra Marine Park which is an important shark sanctuary
5. Nusa Lembongan has expensive tourism fees for mangrove and corals and has high biodiversity assets as well as tourism. Nusa Lembongan is part of 20,057 hectares of Nusa Penida MPA. Mandalika was dedicated as one of Indonesia's KEKs (Special Economic Areas), and is adjacent to 22,940 hectares of Lombok Tengah MPA.
6. Tanjung has had high losses in the community due to storms but is also a high tourism destination. The area is heavily damaged caused by each erosion and recent tsunami in 2019, so could benefit from the insurance and restorative benefits.

Philippines:

The number of occurrences of disasters and weather-related events in the Philippines have been dramatically increasing over the last years, mainly due to climate change. The Centre for Research on the Epidemiology of Disasters (CRED) recorded 187 significant damaging natural disasters in the Philippines in 2007-2016, causing the death of 16,262 people and injury to 44,018 persons.[29]²⁹ More than 100 million individuals in the country have been affected during this period and the socio-economic damages are estimated at US\$19.16 billion.[30]³⁰ A number of potential project sites are being scoped, all of which have high poverty incidence, and are vulnerable to typhoons, flooding, landslides, and storm surge, although the degree of vulnerability varies (from moderate to high). There are also areas which are characterized by significant marine and terrestrial biodiversity.

The possible areas include:

1. Camarines Sur: Caramoan Peninsula and Caramoan group of islands which have beaches, coastal habitats, subterranean rivers, inland and island lagoons and a number of other tourism attractions. Caramoan has been the site for several editions of the competitive reality television series, “Survivor”.
2. Surigao del Norte: Siargao Island, located about 140 km from Tacloban, has a number of municipalities which host a national protected landscape and seascape. In addition to its natural resource endowments, Siargao is seen as an emerging ‘rockstar’ tourist destination due to surfing conditions ideal for international competitions.
3. Bicol: Hosts a number of coral reefs and contributes to around 10% of national fisheries production. Poverty incidence is relatively high compared to the rest of the country, which has a bearing on response / recovery capacity.
4. Albay: The province has high concentration of mangroves, which protect the coral reefs by filtering hazards in the water flowing into the sea; and on specifically the Rapu-Rapu site, all three islands are volcanic in origin and are regularly exposed to hazards such as earthquakes, droughts, typhoons and floods.
5. Eastern Visayas (including Northern and Eastern Samar: On the eastern seaboard and exposed to regular typhoons and tropical storms. Poverty incidence is relatively high compared to the rest of the country, which has bearing on response /recovery capacity.
6. Caraga: Hosts three potential sites with coral reef assets, however exposed frequently to natural disasters, including earthquakes, flooding and tropical storms. Poverty incidence is relatively high compared to the rest of the country, which has bearing on response /recovery capacity. Tropical Depression Amang ravaged the area in January 2019.

Fiji and Solomon Islands:

While there are a number of possible sites identified through a number projects supported in Solomon Islands and Fiji, none of these have been sufficiently scoped to list here. Additional due diligence will be conducted during project preparation.

Main project objectives:

The project objective will be: To enable large-scale financing to increase the climate resilience of coastal businesses, communities and livelihoods in selected countries in Asia and the Pacific, through an innovative public private partnership (PPP) model for coral reef insurance.

In addition, the approach aims to:

1. Following a major natural catastrophe, support reef recovery and long-term conservation on a localized basis, using a Public-Private Partnership (PPP) model that can be tailored and replicated to achieve scale of impact
2. Create markets for nature-based climate insurance products and underlying financial models that utilize the protective values of a natural asset -- coral reefs – to increase resilience while providing resources to conserve and restore coral reefs, both at risk from increasingly frequent severe weather in a changing climate, and
3. Align with and enable corollary (GEF and other) initiatives to establish the reef insurance model in other project areas

Under this proposed project, assuming positive results from the assessments undertaken during the design stage, the proponents will: (i) demonstrate the reef insurance model at a high opportunity site in Indonesia where communities are vulnerable and coral reefs provide protective services to people and property; (ii) install a reef brigade at the Indonesian site, if analyses indicate that this is permitted under laws and regulations governing coral reef management; (iii) engage with stakeholders at candidate sites in the Philippines, Solomon Islands and Fiji^[31] to expand on the prior assessments and analyses and determine the feasibility of implementing the reef insurance model; (iv) install a reef brigade at one site each in the Philippines, Solomon Islands, and/or Fiji, if analyses indicate that this is permitted under laws and regulations governing coral reef management.

In addition to the ADB co-financing through ACliFF, additional financing will be sought through corollary projects to support implementation of the reef insurance model in the Philippines, Solomon Islands and Fiji, depending on the results of the ecological and socioeconomic analyses. The project will also support regional learning activities for wide-scale sharing and dissemination of knowledge and lessons learned.

The project will integrate results-based management, gender equality, environmental and social safeguard considerations.

COMPONENT 1: Implement the reef insurance model at one site in Indonesia

Outcome 1: Sustainable financing mechanism established and reef insurance product structured at one site in Indonesia, providing resources to repair/restore the reef that provides protective services to the site.

Based on the results of a suite of biophysical, socio-economic, risk modeling and policy assessments, the project will implement the reef insurance model at a high-opportunity site in Indonesia. At this site, the project team will engage with coastal tourism, fisheries and/or other local businesses, government agencies, the insurance industry, and local scientists to undertake the following activities.

Output 1.1: Business case for coral reef insurance prepared for one high-opportunity site in Indonesia

As noted earlier, a typhoon can cause severe damage to a coral reef. It is important that tourism and fisheries businesses, coastal communities and other stakeholders who benefit from the presence of a coral reef understand:

1. the protective and provisioning services the reef provides to them,
2. the consequences of damage to the reef by a typhoon, and
3. the economic losses they may suffer if the reef's services are impaired as a result of damage by the typhoon.

An estimation of the economic losses resulting from damage to the reef vis-a-vis the cost of repairs to the reef is essential to incentivize stakeholders to contribute to the cost of repairing and maintaining the reef. It will be essential to establish a solid understanding of the financial value of the physical protection services and of other related ecosystem services provided by the reef. A comparison of this value against the cost of repairing the reef after a storm, and the cost of buying insurance to cover the repairs, was critical to achieving agreement by the local hotel owners' association in Mexico to support the use of tax revenues for reef maintenance and the purchase of the insurance policy.

Based on a high-resolution modeling assessment to identify where the reef provides the most protection we will, at one high-opportunity site in Indonesia, work with local stakeholders to undertake an in-depth analysis to determine the following values and costs and to develop the business case for reef insurance at the site:

1. Estimate the economic value of benefits provided by the reef in terms of coastal protection for reef-adjacent tourism, fisheries and/or other industries;
2. Estimate the economic loss value of those benefits caused by a storm that damages the reef;
3. Estimate local socioeconomic conditions: vulnerability as measured by GDP, exposure to climate risks, insurance coverage and demand
4. Estimate the cost of repairing damage to the reef;
5. Compare expected losses with cost of repairs; and
6. Assess cost of insurance needed to cover the repairs.
7. Assess the availability of public resources to finance a local vehicle (trust) for purchasing the insurance coverage—through a tourism or conservation tax for example; and
8. Estimate the reduction in vulnerability (financial and nonfinancial) of the local communities thanks to the insurance policy.

The project will engage with local and national stakeholders to collect and analyze the results to prepare the business case for insuring the coral reef to protect coastal assets. Important here, will be to have meaningful discussions on the various instruments and mechanisms by which reef maintenance and repair is supported, and reef insurance purchased.

Output 1.2: Enhanced policy, legal and regulatory environment for reef insurance

Typically, a reef is a publicly owned “asset” and only governments have authority to undertake or authorize reef maintenance and restoration activities. The project will assess local policies and legal authorities regarding coral reef management and identify any enhancements needed to support the reef insurance model.

In addition, the insurance industry is strictly regulated in most countries. Laws define what can be insured, who can buy and who can sell insurance and how to settle disagreements. Natural assets are generally public goods. Therefore, it is critical, from the beginning, to conduct a legal assessment of the applicable regulations.

On the demand side, the project will assess who is entitled to buy insurance, which assets and risks can be insured, which types of insurance are sold, insurance penetration, and other factors. The project will also determine what type of risks are relevant to key stakeholders, what types of insurance they need or want, what gaps exist, and how much they are willing to pay.

If relevant, the project will identify opportunities in the law or regulations for amendments which would support the formation of new markets for the model being proposed under this project. The project will also conduct targeted stakeholder interviews and analysis to develop plans to build support for the adoption of the reef insurance model for nature-based solutions.

Output 1.3: Financial mechanism established

The project will assist government and business partners to create a financial mechanism, such as a trust fund, to generate and manage funds to purchase an insurance policy on behalf of the reef, pay premiums, collect the insurance payout in the case of a triggering event, and use the funds to pay for reef repair after a typhoon and to provide annual financial flows for ongoing coral reef maintenance and conservation.

The project will work with key stakeholders to establish the institutional arrangements for the financial mechanism. Depending on the complexity of interests and ownership of the natural asset, this may involve numerous stakeholders – varying from a single entity who, as the owner of the asset, buys the insurance and implements the post-event response, to a complex arrangement.

The definition of the institutional arrangement encompasses the following elements:

Define who pays for the insurance: The entities legally responsible for the care of the natural asset, or those who receive benefits from the ecosystem service, can provide the funding to buy the insurance.

Define who buys the insurance: Identify the entity who can buy the insurance and be the policy holder considering that it has the interest and the legal authority. This entity must have financial capacity to buy it or collect funding from other interested parties. Generally, only one entity can buy an insurance policy.

Identify who receives the payout: The beneficiary of the insurance must have the capacity to manage the funds with transparency and accountability to all the involved stakeholders and ensure that they are used for the intended purpose. The beneficiary of the payout does not need to be the same entity as the buyer of the insurance.

Define the governance and process to manage the payout: There must be governance that defines procedures to decide on the use of the payout, how projects will be approved, funded and monitored. Without this oversight, the process to utilize the payout may prove to be ineffective and inefficient.

Determine which entity will implement the post-event response and repair: Develop the capacity for post-storm response and for the longer-term recovery of the reef. Reef brigades would be trained for the post-storm recovery and may play a role in the longer term recovery, depending on the availability of an alternative capacity to do this. (Described under Output 1.5 below)

Specific discussions around willingness to pay are a central component of the feasibility studies. Detailed talks on willingness to pay should occur after we have ascertained the diverse range of values provided by the reef in specific locations. Further socializing of the concept, and the protective value of the reef, will lead to more informed discussion around the potential sources of funding and the associated willingness to pay. It should also be noted that the concept is more than just an insurance policy and that the underlying funding mechanism is designed to deliver value to the chosen location/region regardless of whether a disaster leads to an insurance payout

One model to consider would be to have the financial mechanism governed by a multi-stakeholder technical committee that includes local and national government officials, representatives of the entities that will pay for the insurance and civil society organizations. It could also have a scientific and technical advisory committee that will propose reef and beach repair and maintenance activities before and after a triggering storm event.

The project will ensure that the structure of the financial mechanism is consistent with the Indonesia Trust Fund Act and all applicable regulations. The project will work with the new Environmental Fund Management Agency, as required, to establish the financial mechanism.

One possible structure to consider for a sustainable financing mechanism is based on a revolving loan facility. The local trust or other vehicle buying the insurance policy will in part be capitalised from public sources (i.e. tax revenues) but additional financing can also be leveraged for example from the private sector that is used to support disaster-proofing efforts on shore as well as reducing storm or human-induced effects on the reef. During project preparation, the structure and potential operations of such a fund will be explored further. A few schemes are under discussion: i) on-lending from the fund to support ‘disaster-proofing’ of waste infrastructure within target communities and businesses, ii) fiscal measures, including tax abatements as reward for good performance, or penalties (“polluter pays”), iii) third party capitalization, or iv) special purpose funds such as conditional grants or micro-lending to strengthen community preparedness and response capacity (e.g. maritime transport services, seafood cold storage chain, etc)

Output 1.4: Insurance product on the reef structured

It is anticipated that the reef insurance approach to be implemented will use parametric insurance, which is designed to pay a pre-determined amount of money when a specific characteristic of an event is met. This type of insurance has a quicker and more straightforward payout process than other types of insurance since an assessment of actual damages is not required. This quick payout allows for a prompt response to the damage, which is necessary to most effectively start repair efforts and enhance the longer term recovery of the reef.

Parametric insurance has three components:

1. A parameter and a threshold that will trigger the insurance: with reef insurance, this will likely be when a typhoon's wind speeds exceed a certain intensity (knots);
2. A polygon that defines the geographic limits within which where the parameter should occur: this requires an assessment and mapping of past storms that have damaged a reef
3. An amount that will be paid out: this requires an understanding of (i) the possible extent and severity of damage to the reef, which will vary depending on the storm, and (ii) the extent and scope of the intervention the insured wishes to undertake – to bring the reef back to its previous condition or to repair some of the damage to facilitate recovery -- and the associated costs. Consideration of several alternate scenarios will be made.

The project will work with an insurance industry partner to assess the risk profile of the project area and determine how a parametric insurance product can be structured to cover the reef, including the following steps:

1. Select the parameter and threshold
2. Define the polygon
3. Estimate the amount of funds needed after a storm
4. Determine the amount of funds required to transfer risk: the buyer must determine how much it must spend to cover costs of reef repair, and purchase insurance to cover higher amounts, and
5. Determine if there is a business case for the beneficiaries of the reef and its services to buy insurance to repair damages from a storm.

The insurance partner will participate in designing the insurance and selling the product, and will provide input to address relevant policy and regulatory gaps.

Would a parametric insurance cover “slow onset” events, such as coral bleaching? Although coral bleaching is potentially a far more complex risk to insure against, a recent survey indicated that insurers think this is conceptually possible. In addition to determining its status as an insurable risk, there remains the challenge of identifying which actions to undertake to address the bleaching (that is, to use the payout). A detailed plan is being developed by various project partners, to create post-storm response capacity which enables the wise use of the payout in the case of damage from typhoons. Consideration is being given to if, and how, one could design insurance cover for slower onset events like bleaching. Funding for this would also need to be identified. This discussion will be expanded during project preparation – and some consideration has also been given in the Annex E discussion on “loss and damage”.

If a significant motivation for private sector and/or government to pay into insurance premiums is tourism value (as is the example in Mexico), is there a risk that less climate vulnerable reefs are selected as "priority" areas by the entities taking out the insurance policy? The project has prioritized coastlines that not only have reefs, that those reefs protect both assets and livelihoods, but also that are vulnerable to coastal storms and cyclones. The set of coastal areas to be drawn upon will already be rather narrow, and predefined by the data, and therefore already vulnerable. There may be some pressure to switch to other areas, in which case stakeholder consultations will determine the best course of action. It is important to note that as long as there is a tangible service (fisheries, tourism, coastal protection, biodiversity), an insurable risk (such as a cyclone) that can severely damage the reef and degrade such service, and the losses surpass the cost of the repair and the policy, the reef is insurable. This product is inherently associated with a

reef that produces a benefit to the potential buyer. Repairing the reef after climate events will increase the resilience of communities which depend on them. The determination of which reef to insure will be based on lengthy dialogue with multiple stakeholders and various enabling conditions. If a particular reef is not very exposed to an insured risk, then it is likely that demand for the coverage will be low. The project team will, as noted, expand more during preparation of detailed proposal.

Output 1.5 Risk management and post-storm response capacity built at one Indonesian site, as enabling conditions permit

Severe climatic events such as typhoons can severely damage a coral reef. Such events can break and uproot coral colonies, collapse reef structures, reduce crest height and rugosity and eliminate live coral cover. Sand and debris from the mainland can cover them and inflict further damage.

Enabling conditions, including sound policies /strategies and an understanding of the risks, combined with a rapid post-event response are essential to minimize the damage and enhance the recovery of the reef. Fortunately, post-storm reef repair and restoration techniques have improved significantly in recent years.

Typically, a reef is a publicly owned “asset” and only governments have authority to undertake or authorize reef maintenance and restoration activities. The project will assess local policies, regulations and legal authorities regarding coral reef management.

If permissible under local regulations, the project could create post-storm response capacity, including training a reef brigade.

The project will develop four elements of post-storm response capacity:

1. *Governance*: the project will identify the lead agency with responsibility for reef management and work with them to create a coordinating committee and an operations committee comprised of relevant stakeholders. The agency and the committees will lead and coordinate all planning and preparations for activities to be conducted every year prior to the typhoon season. In case of a storm event, they will lead the response. **In this connection, annual training on risk and vulnerability assessment will be conducted (covering natural, built and human assets).**
2. *Protocol*: the project will work with the lead agency to adapt the Post-Storm Protocol to the conditions of the site. The Protocol, which has been developed for application in the Meso-American context, provides guidelines for annual preparation and planning and for post-storm response.
3. *Brigades*: the project will train volunteer brigade members to assess the damage to the reef, remove debris and make initial repairs to the reef after each triggering storm event; it will also train them to conduct ongoing maintenance of the reef throughout the year. Brigades require that there be diving capacity and expertise at the site. The brigade would be comprised of volunteers from local stakeholder communities, such as tourism operators, fishermen, scientists, park managers and others who benefit from the reef’s presence and have an interest in repairing it.

4. *Financial strategy*: the project will work with the lead agency and the Coordinating Committee to reach agreement on who will contribute funds to support the repairs; for example, in Mexico, hotels contribute fuel and tour operators provide boats for the volunteers to use in conducting the repairs.

A post-storm response requires preparation before and after a storm and encompasses the following phases:

1. *Annual preparation and planning*: every year, prior to the typhoon season, the committee must prepare by ensuring that the governance structure is in place, risks and vulnerabilities are assessed, equipment is ready, enough brigade members are trained and by providing training refreshers, securing funding for the season, etc.
2. *Warning*: preparations should be undertaken when a typhoon is approaching, including re-checking materials, measures to ensure peoples' safety, and readiness to respond after the storm.
3. *Rapid assessment*: within 2-5 days of a storm event, evaluate damages to the reef and prepare a response plan.
4. *Response*: clean up debris, stabilize and re-attach corals, establish nurseries.
5. *Recovery plan*: includes a final evaluation of damages and of the results of the response, and identifies restoration needs for subsequent years.

The reef brigade will normally operate on a voluntary basis to undertake repairs after minor events and support reef management. Once the business case is presented (reference Output 1.1), local stakeholders understand the value the reef is providing to their businesses and livelihoods and are very willing to volunteer their time or material contributions for its repair and ongoing maintenance. When the reef insurance mechanism is established at the site, insurance payouts after triggering storm events would provide additional resources to the brigades for repairs made following the storms.

In summary, annual training will be conducted for: i) local management committees (multiple stakeholders) on governance elements of disaster risk management, ii) key community members on risk and vulnerability assessment (covering natural, built and human assets). If permissible under local regulations, and if local diving capacity etc. exists, the project will create post-storm response capacity, including training: i) a reef brigade, at one site; ii) supplemented by training of trainer activity, and annual refreshers. The training of a reef brigade will contribute lasting capacity for post-storm response; this capacity can also be a valuable resources on other occasions – for example, after ship groundings, earthquakes, tsunami or other events that might damage a reef, and to support ongoing reef management activities organized by the responsible park management authority. This will be undertaken in coordination with Output 2.4.

COMPONENT 2: Extension of model to the Philippines, Solomon Islands and Fiji

The project will build on the prior analyses conducted for these countries (including during project preparation) and undertake more in-depth assessments of the applicability of the reef insurance model at candidate sites. {GEF funds will not be used to support activities in Fiji}

Outcome 2: Regional and site-level assessments and post-storm response capacity enhanced

Output 2.1: Regional assessment of damage to reef correlation for typhoons and tsunami

An important part of assessing potential impacts on reefs is to understand the correlation between windspeeds associated with typhoons and severe weather and the damage they cause to the reef. The team will assess whether these data already exist and if they are available to be used in the project. If insufficient data are found then new research will be commissioned, likely at the regional level.

Output 2.2: Site level assessments and data profiles prepared for at least one site each in the Philippines, Solomon Islands and Fiji

Informed by analyses undertaken during project preparation, the project will conduct a more detailed assessment of relevant enabling conditions at specific sites to further evaluate their suitability for coral reef insurance. This will include an assessment of:

1. Condition of the coral reef adjacent to the site;
2. Environmental services provided by the reef to local economies, including local tourism and/or fisheries businesses that benefit from the presence of the reef. This may include the value of investment in hotels and restaurants, the number of jobs created by these businesses, etc;
3. Willingness to pay by local businesses and relevant government agencies to protect the coral or investment.
4. Cost to repair reef
5. Stakeholder analysis to determine who benefits from the reef
6. Options for suitable funding mechanisms

Output 2.3: Reef protective value assessed at one site in Philippines

Modeling to assess resilience value of the reef will be undertaken for Indonesia and the Philippines during project implementation (due to the costs of the modeling). During the project preparation phase, an initial assessment of environmental services provided by the reef will be conducted for the four countries. More detailed assessments for Solomon Island and Fiji would be possible if funds permit.

For this output, the project will conduct a high-resolution modeling assessment to identify where reefs in the Philippines provide the most protection from typhoons to coastal businesses and communities. This would be undertaken through stakeholder consultations with local tourism, fisheries, and other industries; officials from planning, public works, environment and fisheries agencies; and with civil society and community representatives.

Output 2.4: Increased risk management and post-storm response capacity at one site each in the Philippines, Solomon Islands and Fiji (as enabling conditions permit)

As noted for Indonesia, a reef is typically a publicly owned “asset” and only governments have authority to undertake or authorize reef maintenance and restoration activities. The project will assess local policies, regulations and legal authorities regarding coral reef management.

Annual training will be conducted for: i) local management committees (multiple stakeholders) on governance elements of disaster risk management, ii) key community members on risk and vulnerability assessment (covering natural, built and human assets). If permissible under local regulations, and if local diving capacity etc. exists, the project will create post-storm response capacity, including training: i) a reef brigade, at one site in each country; ii) supplemented by training of trainer activity, and annual refreshers. The brigade would be comprised of volunteers from local stakeholder communities, such as tourism operators, fishermen, scientists, park managers, etc., with an interest in repairing the reef. The project would develop the four elements of post-storm response capacity as described above for Indonesia (coordinated with **Output 1.5**).

COMPONENT 3: Knowledge management and monitoring approaches enhanced

The project will benefit from an existing guide on “How to Insure Nature” (TNC), which will be a reference to support implementation of this project. This proposed project will generate additional learning that can inform the design and implementation of the reef insurance model in Indonesia and other countries of the Asia and the Pacific region, particularly in further developing and testing the methodologies and approaches to used.

The project will synthesize the data developed through the analyses undertaken in the four countries into tool kits, and, if needed, adapt the “How to Insure Nature” guide or develop a regional guide tailored to the Asia Pacific region.

As the model is implemented through corollary projects, the project will continue to develop and disseminate this knowledge in order to promote the creation of self-sustaining markets to scale up the model.

Outcome 3: Improved awareness by local, national and international stakeholders in participating countries of the benefits provided by coral reef ecosystems and their protective services to coastal businesses and livelihoods

The project will generate lessons learned and best practices for implementing the reef insurance model as presented in the Guide. The project will synthesize the data developed through the analyses undertaken in the four countries and through implementation of the model in Indonesia into one or more toolkits and, if needed, adapt or develop a regional Asia-Pacific guidance document.

Output 3.1: Toolkit that provides guidance on implementing each phase of the model

1. For example, guidance on developing the business case would include:
2. How to conduct a risk analysis to support the business case
3. How to estimate the value of a reef and prioritize sites
4. How to estimate the cost of restoration and repairs

5. How to estimate damages to reefs

6. How to estimate losses to local economies and stakeholders.

Output 3.2: Audience-segmented knowledge and communications materials prepared and disseminated

Multimedia communications materials will be developed targeting:

National and local governments on enabling conditions, ecosystem science and financial mechanisms for effective use of the reef insurance model

Hotels, transport and tourism operators and other stakeholders in business sectors on the benefits for coastal economies of coral reef conservation using the reef insurance model.

This will include, but not be limited to outreach to peer-to-peer business networks (including women-led enterprises)

The *private insurance industry* to encourage widespread offering of insurance products for coral reef conservation; and to encourage new capacity and market development perspectives within the insurance sector.

The project will disseminate the knowledge products through global networks, such as the International Coral Reef Initiative (ICRI) and the Reef Resilience Network, and leverage regional and international platforms to disseminate it to national and local governments. This will be done using a variety of means, including, but not limited to, a suite of webinars and other online offerings. The aim will be to extend reach across the wider Asia and the Pacific countries, to other regions, particularly Meso-America and the Caribbean.

The project will also socialize this climate risk insurance model through the ongoing engagement by the project partners with insurance industry platforms and organizations such as the Insurance Development Forum (IDF), the Ocean Risk and Resilience Action Alliance (ORRAA), The Geneva Association, the International Insurance Society and other appropriate fora to further build interest and support by the industry around insurance for nature and catalyze the creation of self-sustaining markets for reef insurance in the region and globally. The project will also share lessons learned with the Green Climate Fund (GCF).

Output 3.3 Monitoring and evaluation conducted

A project monitoring system will be established to capture and host data relevant to the coral reef insurance initiative and beyond. The parameters of this monitoring will coincide the the GEF LDCF/SCCF results framework and beyond.

A mid term review and terminal evaluation of the project will be supported.

4) Alignment with GEF Focal Areas / Impact Programs

The project is consistent with the goal of the new LDCF/SCCF programming strategy as it aims to strengthen resilience and reduce vulnerability to the adverse impacts of climate change in developing countries, and support their efforts to enhance adaptive capacity. It is relevant to corresponding sections of the UNFCCC Paris Agreement as it relates to climate change adaptation. The GEF project will play a catalytic role “in testing and adapting technologies and innovative practices to specific conditions and capacity, creating favorable policies and strategies, providing systemic support to innovation through incubation and accelerators, piloting financial tools, risk transfer mechanisms, including risk insurance, climate risk pooling and other risk sharing solutions, and strengthening private sector engagement in adaptation.” It is also relevant to the objectives articulated under the SCCF, which would support “examples of innovative and technology transfer oriented external development initiatives... such as risk insurance schemes for specific vulnerable regions.”^[32]³²

The project is in alignment with the pre-selection criteria of the GEF Challenge Program on Innovation in Adaptation. It will: i) Demonstrate innovative business model and investment approach to climate insurance for a natural asset (coral reefs) with high potential to catalyze private sector action in the insurance and coastal tourism and fishing industries, ii) Serve as proof of concept for a cost-effective and replicable PPP to increase climate resilience of coastal economies and livelihoods in priority sectors, iii) Support economic case for a financial mechanism for hotels, coastal businesses (including small and medium enterprises) and communities, iv) Leverage investments in the maintenance and restoration of coral reefs, whose protective and provisioning services provide significant economic and social value to their operations, v) Expand the vision of the insurance industry to protect natural assets, reduce losses and stimulate a growth market for insurance products, vi) Build institutional capacity for insurance uptake and catalyze the scaling of insurance markets and products with potential applicability for other natural coastal assets such as mangroves, and vii) Work through a multi-stakeholder partnership.

Biodiversity (BD) Focal Area objectives will also be addressed under this project, although no (BD) funds will be committed under this project. It is relevant to objectives under Objective 1: mainstreaming of biodiversity, by improving policies and decision-making informed by biodiversity and ecosystems values (in this case protective and provisioning of coral reef ecosystems), as well as managing biodiversity in priority seascapes. As it relates to natural capital accounting assessment, the project will be consistent with GEF guidance in that it will seek to: “i) mitigate or eliminate harmful incentives leading to the degradation of natural capital assets or to identify positive financial and other policy incentives for the maintenance or enhancement of these assets ; and ii) enhance financing for sustainable management and restoration of natural capital, including through affecting public and private financial flows. This may include expanding the use of green finance mechanisms and solutions, as appropriate (e.g., green bonds, blue bonds, etc).” The project will also be relevant to Objective 2: Improving financial sustainability, effective management, and ecosystem coverage of the global protected area estate. Project activities will aim to support: i) effective protection and management of ecologically viable and climate-resilient representative samples of project ecosystems, ii) secure adequate financial resources to support protected area management costs; and iii) strengthen local capacity to manage protected and key biodiversity area resources effectively, over the long term.^[33]³³

5) Incremental cost reasoning

In the project countries, under the business as usual (BAU), coral reef ecosystems continue to degrade, despite best efforts. In the Philippines, a coral reef survey conducted between 2015 and 2017, which covered 166 coral sampling stations, reported that none of the reefs were classified as “excellent”. Ninety percent were classified as either “poor” or “fair”.^[34]³⁴ In Indonesia, a study undertaken by the Indonesian Institute for Sciences (LIPI) noted the precarious state of the country's coral reefs . Of 1067 sites in the country, just 6.5 percent of the coral reefs were in “excellent” condition, while 36 percent were deemed in “bad” condition, with some 34 percent in “sufficient” condition with the rest classified as being in “good” condition.^[35]³⁵ Similarly, in Solomons Islands and Fiji, coral reef ecosystems are continually exposed to a number of threats, both anthropogenic and natural.^[36]³⁶

As part of its work with the CTI-CFF countries, ADB supported activities to help Indonesia, the Philippines and Solomon Islands undertake a costing of their National Plans of Action (NPOAs). The aim of the exercise was to help countries determine the financing gap between available resources for priority actions (and sub-actions) across 5 thematic and three cross-cutting areas - - and the actual financing available. Although there were many challenges, by and large, countries were able to indicate with some measure of confidence that the financing gaps were significant. For the Philippines, for example, around USD 300 million would be required to fully implement the National Plan of Action from 2014-2020 or an average of US\$ 43 million per year. For Climate Change Adaptation thematic area, the funding requirement for that period is US\$ 37,410,000; whereas, at the time of study, the funds available amounted to a paltry US\$ 31,000.^[37]

The proposed GEF project aims to address the chronic “underfunding” challenges that climate change adaptation proponents face – and put in place a system where financing of climate change adaptation will be explored more systematically for long term impact. The incremental cost reasoning, hence, is that upfront investments in prevention and maintenance of coral reef ecosystems will reduce the actual direct and indirect costs of damages, losses and recovery of physical and natural assets. Establishing an insurance product which will pay out to communities in cases of catastrophic storm events, adds to this measure. █

6) Adaptation benefits

The GEF project will contribute to: i) Increased resilience of physical (e.g. property, people) and natural assets made vulnerable to climate variability and change in project areas, ii) Enhanced capacity of businesses and communities in coral reef-adjacent coastal areas in select site(s) to extract a resilience dividend (effectively cost-savings) from up-front investments that reduce future losses and enhance recovery readiness, iii) Demonstrated innovation in insurance, including through creation of enabling policies, financial mechanisms, climate data analytics and institutional capacities for risk transfer and pooling, noting the differences in tenure systems (Pacific vs SE Asia), and iv) Practical steps to support and scale up reef insurance model areas pending results of feasibility analysis through additional funding for complementary project(s).

In terms of monitoring and reporting, the project will use the new LDCE/SCCF tracking tool, under the options for LDCE and SCCF Challenge Windows, and address climate change challenges under “natural hazards”. The project will track the four Core Indicators, and report specifically on the following overarching outputs: i) new / improved climate information systems deployed (in project areas), ii) vulnerable natural ecosystems strengthened in response to climate change impacts, iii) number of people made aware of, and

training in climate adaptation response measures, iv) financial instruments or models to enhance climate resilience developed, iv) systems and frameworks established for continuous monitoring, reporting and review of adaptation, v) climate risks and vulnerability assessments conducted, vi) institutional coordination mechanisms created or strengthened to access and/or manage climate finance, among others.

7) Innovation, sustainability and scaling up

Innovation: The proposed approach is highly innovative; it is the first of its kind in the Asia-Pacific region. The insurance of nature is virtually unique. The model is also replicable and scalable. Transferring the risk of restoring damages to nature is sound financial strategy for both the beneficiaries and the entities responsible for the natural asset. The proposed approach is analogous to taking out insurance to cover the repair of a dyke or seawall (gray infrastructure) and also to pay for the regular cost of its operation and maintenance. The innovation in the approach is the creation of an insurance product that covers the cost of repairing a natural infrastructure asset (the reef) and, through an underlying funding mechanism, establish a dedicated revenue stream for its ongoing conservation. There is currently only a single example of this world-wide.

The proposed approach of creating an insurance product for ecosystems service provisioning is well aligned with GEF interest in supporting innovative business models, as noted in the STAP document “Innovation and the GEF”, which cites as an example the GEF project in the Philippines aimed at expanding access to index-based weather insurance for smallholder farmers.

The reef insurance model may be relevant for other natural assets, such as mangrove ecosystems, in coastal areas where typhoons cause damage to coastal businesses and communities. The potential could be assessed with additional funds.

Scalability: The need to take this initiative to scale has never been more urgent. Governments around the globe are witnessing rapid population growth in coastal areas. They are increasingly sensitive to the need to enhance resilience to severe weather and climate change. Furthermore, government budgets at both national and local levels are not sufficiently robust to be able to finance the increasing burden of severe weather impacts—a fact that is even more pronounced in developing countries. Economic losses from disasters, both in wealthy and developing economies, are topping \$300 billion per year^[38]³⁷. Similar analyses at country level where reef insurance markets may be feasible has been undertaken. In addition to the four countries participating in the proposed project, other countries include: Malaysia, Viet Nam, Myanmar, Thailand, Vanuatu (and other countries in other regions). This demonstrates the potential for scaling the approach within the Asia-Pacific region.^[39]

Sustainability: There are a number of dimensions to ‘sustainability’, or ‘durability’ as mooted in recent GEF discussions which have bearing on this project. First, the project aims to address the long term durability of coastal communities to withstand and respond to catastrophic natural events. It aims to reduce loss of life. Typhoon Haiyan in November 2013 (known as “Yolanda” in the Philippines) resulted in at least 6,300 deaths (and estimated \$ 3 billion in damages). While the focus of this small project is on coral reef assets, it is anticipated that it will be cast within the broader framework of disaster risk prevention, reduction and management which is supported by all the participating countries. The project aims to shore up socio-economic capacity of businesses and communities to respond to and recover from such natural catastrophes, in order to reduce economic losses and business momentum. Importantly, the project aims to address issues related to long term financial sustainability of managing coral reef ecosystems, which has proven difficult for

many countries, given the strain on national and local budgets, and possible opportunity costs of financing biodiversity and ecosystems as opposed to other priorities such as education, health, energy etc . The vision is eventually to create some forms of sustainable financing mechanisms in participating countries, which would have three main objectives: i) to finance ongoing and future maintenance of coral reef ecosystems in project areas, ii) to establish a way to pay out to communities, funds dedicated to recovery of natural assest from catastrophic events through the insurance policy, and iii) if possible,through proposed associated initiatives, generate reflows to the GEF.[40]

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- [1] Center for International Earth Science Information Network - CIESIN - Columbia University. 2013. Low Elevation Coastal Zone (LECZ) Urban-Rural Population and Land Area Estimates, Version 2. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC).
- [2] Spalding, M. D., R. D. Brumbaugh, and E. Landis. 2016. Atlas of Ocean Wealth. The Nature Conservancy, Arlington, VA.
- [3] All monetary figures presented in United States Dollars (USD).
- [4] Beck MW, Losada, IJ, Menendez, P, Reguero BG, Diaz-Simal, P, Fernandez, F. 2018. The global flood protection savings provided by coral reefs. *Nature Communications*, 9:2186.
- [5] Costanza, Robert; de Groot, Rudolph; Sutton, Paul (2014). "Changes in the global value of ecosystem services". *Global Environmental Change*. 26 (1): 152–158. doi:10.1016/j.gloenvcha.2014.04.02
- [6] Spaulding, M. et al. (2017) Mapping the global value and distribution of coral reef tourism.
- [7] Carcasson, R.H. 1977. A Field guide to the coral reef fishes of the Indian and West Pacific Oceans. William Collin Sons & Co Ltd. London, Glasgow, Sydney, Auckland, Toronto, Johannesburg. 320p
- [8] Asian Development Bank. (2014). State of the Coral Triangle: Indonesia.
- [9] MMAF. (2017) Marine and Fisheries in Figure 2018, Ministry of Marine Affairs and Fisheries, Republic of Indonesia.
- [10] Reefs at Risk Revisited, 2012
- [11] UNEP-WCMC, WorldFish Centre, WRI, TNC (2018). Global distribution of warm-water coral reefs, compiled from multiple sources including the Millennium Coral Reef Mapping Project. Version 4.0. Includes contributions from IMaRS-USF and IRD (2005), IMaRS-USF (2005) and Spalding et al. (2001). Cambridge (UK): UN Environment World Conservation Monitoring Centre. URL: <http://data.unep-wcmc.org/datasets/1>
- [12] Burke, L. et al. (2011) Reefs at Risk Revisited. World Resources Institute.
- [13] Leitmann, J. et al. (2009) [Investing in a more sustainable Indonesia: Country Environmental Analysis](#). CEA Series, East Asia and Pacific Region. Washington, D.C.: World Bank.
- [14] SIDIK, 2017
- [15] Burke, L. et al. (2012). Reefs at Risk Revisited in the Coral Triangle. *Defenders* (Vol. 74).
- [16] RBI 2016
- [17] Will a \$1,000 entrance fee to a national park save the Komodo dragon? <https://www.washingtonpost.com/travel/2019/10/02/will-entrance-fee-national-park-save-komodo->

dragon/

[18] SPREP, 2016 (in the NAP, 2018)

[19] Gardner et al. 2005

[20] BNPB (2016) Risiko Bencana Indonesia (Disaster Risk of Indonesia). Indonesia's National Disaster Management Authority (BNPB).

[21] A. Abraham. Stock Take of CTI-CFF Programs and Projects: Strategic Review of Progress and Future Directions. Asian Development Bank, Mandaluyong, 2015.

[22] https://www.greenclimate.fund/documents/20182/893456/16900_-

[_Strengthening_the_Resilience_of_the_Most_Vulnerable_Coastal_Communities_to_Climate_Change_in_the_Philippines__Eastern_Seaboard.pdf/3723cfe8-67f1-4606-80b5-d0ef2ed75c2c](https://www.greenclimate.fund/documents/20182/893456/16900_-Strengthening_the_Resilience_of_the_Most_Vulnerable_Coastal_Communities_to_Climate_Change_in_the_Philippines__Eastern_Seaboard.pdf/3723cfe8-67f1-4606-80b5-d0ef2ed75c2c)

[23] Created under the Solomon Islands Water Act of 1992, SW is the publicly owned utility currently delivering water supply services to approximately 65,000 people in 4 urban centers (Auki, Honiara, Noro, and Tulagi)

[24] GEF ID 10173: Climate Resilient Urban Development in the Pacific.

[25] It should be noted that ACliFF support will be distinct from the GEF processes, and subject to processing within the guidelines of the ACliFF trust fund.

[26] This income may be especially valuable as many of the first responders may have lost jobs/income in the aftermath of a major event.

[27] https://climateanalytics.org/media/Ind_costing_and_financing_mechanisms_caribbean_outlook.pdf, Loss and Damage Costing and Financing Mechanisms: Caribbean Outlook, by Adelle Thomas, Inga Menke and Olivia Serdeczny.

[28] Spalding, M. D., R. D. Brumbaugh, and E. Landis. 2016. Atlas of Ocean Wealth. The Nature Conservancy, Arlington, VA. Also: Beck MW, Losada, IJ, Menendez, P, Reguero BG, Diaz-Simal, P, Fernandez, F. 2018. The global flood protection savings provided by coral reefs. *Nature Communications*, 9:2186.

[29] The CRED records an event as a natural disaster if it meets at least one of the following criteria: (1) ten or more people reported killed; (2) 100 or more people reported affected; (3) declaration of a state of emergency; and (4) call for international assistance

[30] DENR. Caramoan Group of Islands Physical Development Framework Plan, 2017-2021.

[31] GEF funds will not be used to support activities in Fiji.

[32] GEF/LDCF.SCCF.24/03, June 1, 2018 (emphasis added).

[33] GEF/R.7/19, April 2, 2018 pp, 14-30.

[34] <https://businessmirror.com.ph/2018/02/25/mission-reduce-threats-to-coral-reefs/>

[35] <https://phys.org/news/2018-11-indonesia-coral-reefs-bad-state.html>

[36] Asian Development Bank. State of the Coral Triangle: Solomon Islands. Mandaluyong City, Philippines: ADB, 2014; and Moritz C, Vii J, Lee Long W, Tamelander J, Thomassin A, Planes S (editors). Status and Trends of Coral Reefs of the Pacific. Global Coral Reef Monitoring Network. 2018.

[37] ADB. "Costing the Philippines National Plan of Action for the Coral Triangle Initiative-Coral Reef, Fisheries and Food Security". Mandaluyong City, 2015. Note that this took place before the Green Climate Fund (GCF) was fully operational.

[38] <https://www.preventionweb.net/risk/direct-indirect-losses>

[39]TNC is assessing the feasibility of the model in Guatemala, Honduras and Belize (and in the USA).

[40] Discussions are ongoing with the Government of Indonesia, GEF and other actors in the 'blue finance' space, to prepare a larger, more in depth and dedicated project which would result in establishment and operation of such a financing mechanism.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

Refer to Annex.

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

Civil society organizations: Will include international NGOs as well as local CSOs working on field level implementation of coastal and marine resources management in participating countries. Engagement will be through individual consultations as well as focus group discussion. CSOs will have a role in providing valuable empirical insights, participate in capacity development / training, and monitoring/ knowledge management.

National and local governments: Direct consultations will be supported with key responsible national government agencies and their provincial / local counterparts, other government departments (e.g. meteorology, climate change commissions, disaster risk management authorities). Governments will have a key role in the project as owners of natural assets. They will participate in all aspects of the project, particularly around the development of the insurance product. For PIF preparation, consultations have been taken

with relevant Government agencies in all four countries (primarily those indicated as Project Executing Entities), as well as agencies which form part of the National Coordinating Committees under the CTI-CFF.

Research and academe: Universities and higher education institutions will be briefed and encouraged to participate in project activities (e.g. research and teaching opportunities, participation on reef brigades etc)

Private sector: Direct consultations with tourism industry associations, hotels, travel and tour operators, tourism industry services providers, fisher families and households, fisheries processing companies, chambers of commerce and other business support organizations. This will be supplemented by general communications with the insurance industry to keep them apprised of the initiative -through various associations including at the global level IDF, ICMIF, ORRAA, and locally, the Indonesian General Insurance Association (Asosiasi Asuransi Umum Indonesia) and FAPI (Federation of Indonesian Insurance Associations) (to be confirmed).

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

Between 1970 and 2010, Asia and the Pacific populations living in cyclone-prone areas grew from 72 million to 121 million. Impacts of disaster caused by natural hazards are not gender-neutral. In areas where women have lower socio-economic status, natural disasters kill more women than men—both directly and indirectly through related post-disaster events. Women's lives are lost at a younger age than men, and impacts of natural disasters are not only determined by nature alone. Differences in mortality are generally attributable to “unequal access to opportunities and unequal exposure to risks, making them more vulnerable to natural disasters”^[1].

Women are disproportionately affected by climate change and natural catastrophes, mainly because they play multiples roles in food, water and energy provision for families and relative dependency on natural resources for livelihoods. This, concurrently, proffers opportunity for women to act as important agents of change in building resilience to climate change and natural disasters.

There are a number of dimensions to vulnerability of women to natural disasters:

1. Reproductive roles can limit chances of survival, especially those in final stages of pregnancy, with young children, rendering them less mobile
2. When basic health care infrastructure is damaged, access to care is reduced; and chances of maternal and child mortality increase

3. Social norms and gender-based roles may determine ability of women and girls to survive impacts of disaster, for example inability to swim or climb trees; self-rescue techniques practiced mainly by men and boys
4. Dress codes can restrict the ability of women to move quickly when disaster strikes, and also from learning about practical survival skills.
5. Social norms and customs may prevent women from relocating without the consent of male family members; which would constrain access to information on how to escape or locate evacuation centres
6. With limited access to economic resources, information and technology, women's vulnerability and adaptive capacity is affected. Being confined to traditional, home-based setting makes it difficult for them to be mobile, engage in planning and policy formulation processes related to risk management, access markets, education and other resources – which tend to underpin a 'cycle of vulnerability'
7. Inheritance laws, marriage arrangements, banking rules, and other rules increase women's dependence on men
8. Post-disaster recovery, increases the workload on women as they are usually on the frontline in terms of re-organizing households, relocating families, collecting food and basic provisions. This contributes to higher incidence of school dropout for girls, and interrupts skills acquisition and other livelihoods.

During detailed project preparation a complete and relevant Gender Action Plan (GAP) will be prepared. The GAP will identify measurable targets, and include, but not be limited to the following considerations:

1. Ensure that data collection (e.g. socio-economic, livelihood, spatial mapping etc), includes sex-disaggregated information
2. Project activities such as stakeholder consultations, workshops, capacity-development / training, committees, etc, are participatory and inclusive – targeting women (e.g. at least 30%). Vulnerability needs assessments will incorporate special gender considerations
3. Policy, legal, regulatory and financial analyses should support gender mainstreaming, and in particular identify clear institutional roles and responsibilities, particularly as they pertain to vulnerability in disaster situations.
4. Due attention will be given to sector-based considerations, for example women's roles in seafood supply chains, tourism and related services etc. Increasing access to finance, and allowing for more mobility of women in the fisheries supply chain, for example, is likely to support more sustainable outcomes.
5. Women should participate in frontline project activities, including policy planning, coral reef management and maintenance, monitoring / evaluation etc. The project will foster equal participation of men and women in 'reef brigades', for example
6. Project efforts should encourage women leadership in natural resources management, particularly through strengthening of networks and communities of practice. Included here will be collaboration with the Women Leaders Forum (WLF), hosted by the Coral Triangle Center

(CTC) in Bali, as part of the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF). The WLF serves as a peer learning network for women who play key leadership roles in sustaining the marine resources of the Coral Triangle. The WLF is a platform for sharing of knowledge and tools that integrate gender principles in sustainable marine conservation.

7. In relation to above, support a recognition system that highlights the role of women champions in coral reef conservation and management, and in the structuring of any sustainable financing mechanism, ensure that women have equal participation in design and implementation fund structuring and management, for example, as it relates to governance. If relevant, access should be facilitated to finance where women and women-led enterprises are able to strengthen livelihoods and households against natural hazards.

[1] ADB. "Gender-inclusive Disaster Risk Management". Mandaluyong, Philippines. Nd.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes

closing gender gaps in access to and control over natural resources; Yes

improving women's participation and decision-making; and/or Yes

generating socio-economic benefits or services for women. Yes

Will the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

The private sector has stakeholders that will play an essential role in this project. For example, it is likely that the project will have a dialogue with hotel owners and tourist operators to verify data collected on expected damages and loss of business resulting from severe weather or, potentially, tsunami. This data will be essential for building the business case as the project assesses how much damage the reef is preventing.

Once the business case is established the project team will reengage these private sector operators to illustrate just how important the reef is to their business model and the local economy from the perspective of the risk reduction service it provides. It is also expected that data will be provided on the tourism and livelihood values provided by the reef.

Other private sector players, such as reinsurance and insurance companies, will work with the project proponents to develop the appropriate insurance policy for a reef. Core data needed for this process includes information on the likely cost of repairing or restoring the reef and the correlation between, for example, windspeed and damage to the reef.

Boat operators, dive companies and other tourist companies will also become important partners if it proves possible to establish reef brigades in any of the countries in focus.

5. Risks

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Risk	Management options
Credible data and information is not readily available	Some initial work has started. The project will undertake rigorous due diligence with respect to data collection. It will combine sources which include the relevant meteorological and disaster risk management offices, statistical authorities, census bureaus, fisheries, tourism and coastal management departments, existing databases of donor organizations, international NGOs, as well as primary survey methods where possible. Data will be cross referenced to the extent possible.
Government capacity in project areas is limited	Identify key capacity gaps. Support focussed stakeholder engagement, and include local communities and civil service organizations to help design capacity development initiatives. Establish multi-stakeholder committees and groups to carry forward actions, with government as key partner.
“Buy-in” to project across some stakeholders, including private sector in tourism and seafood value chains. This includes reluctance to pay premiums	Support efforts to quantify potential costs of inaction and lack of prevention and preparedness for natural disasters. Ensure that credible and verifiable data is presented and subject to different types of modelling scenarios, with a view to quantifying potential losses and damages; as well as the economic costs of recovery. Put forward low, medium, high and subsidized premium models. The lower the premium, the less financing available for resilience building so there needs to be an incentive to come up with a premium rate that is acceptable to local governments. Consumer confidence can be addressed in different ways, including through the use of reputable local and international in/reinsurance providers.

Legal and regulatory frameworks are not amenable to coral reef insurance – and enabling conditions are challenging

Work closely with government and community stakeholder to identify challenges and suggest policy, legislative and regulatory innovations. Engagement with the private sector insurance industry would be helpful in this regard to build trust.

'Post-storm response capacity' refers to the reef brigades. The project will investigate multiple sites across Indonesia and the Philippines, and engage in discussions with stakeholders during the assessments in the Solomon Islands and Fiji. On this basis, the project will endeavour to identify more than one location in the participating countries which this post-storm response capacity can be built.

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

Project coordinating committees will be established in each of the countries, which will consist of lead agencies for disaster risk management, climate change adaptation, and/or integrated coastal and marine management. Also included will be community-based organizations, local governments, research / academe and private sector industry as relevant to the various candidate sites.

The project will coordinate closely with a similar initiative being advanced by WWF-US under the same GEF Challenge Program for Adaptation Innovation in several Melanesian countries. The project aims to provide financial tools for small scale fishers. Initial consultations have been undertaken with WWF-US, and there appear to be several areas of complementarity. WWF-US work on “enabling environment for financial products to improve resilience for targeted regions in Fiji and PNG” and “financial products and incentives for small-scale fishers” will be explored carefully for synergies. In addition to working jointly in Fiji, the WWF-US project also aligned with a UNDP Global Coral Reef Fund being considered for both these countries. There may also be scope for joint initiatives in knowledge sharing and transfer.

Further, the ADB GEF project will coordinate with a number of key Development Partners’ initiatives associated with the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF). This includes a range of national and sub-regional projects supported by World Conservation Society (WCS), TNC, Conservation International, WWF, Australian Government, German Government (through GIZ) and USAID. It will align with the restructured ADB/GEF “Coral Reef Rehabilitation and Management Program-Coral Triangle Initiative” (GEF ID 5171), which is being implemented in the Lesser Sunda Seascape sites. Lessons drawn from the ADB/GEF regional technical assistance projects (GEF ID: 3591) in South East Asia (Philippines, Indonesia and Malaysia) and Pacific (Solomon Islands, Fiji, Papua New Guinea, Timor Leste, and Vanuatu) will be referenced during project preparation and implementation.

In the Philippines it will complement a proposed Coastal Resilience Initiative (CRI) for the Eastern Seaboard, which will cover mangroves, seagrass and upland areas (but not coral reefs), if approved (by Green Climate Fund). **Reference to Annex A.**

Further, the work proposed has been highlighted as a key opportunity for ORRAA to support a new initiative through UNDP financed by BMZ for 20 countries which focuses on inclusive insurance programming. This is essentially community-driven micro-insurance which links to industry partners such as SwissRe, MunichRe, SCOR, and WillisTowersWatson.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assesments under relevant conventions

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

- National Bio Strategy Action Plan (NBSAP)
- CBD National Report
- Cartagena Protocol National Report
- Nagoya Protocol National Report
- UNFCCC National Communications (NC)
- UNFCCC Biennial Update Report (BUR)
- UNFCCC National Determined Contribution
- UNFCCC Technology Needs Assessment
- UNCCD Reporting
- ASGM National Action Plan (ASGM NAP)
- Minamata Initial Assessment (MIA)
- Stockholm National Implementation Plan (NIP)
- Stockholm National Implementation Plan Update
- National Adaptation Programme of Action Update

- Others

The project is consistent with the four priorities for action identified in the UN-supported “Sendai Framework for Disaster Risk Reduction (2015-2030)”^[1], particularly Priority 3: “Investing in disaster risk reduction (DRR) for resilience”, which advocates for public and private investments in DRR and prevention using structural and non-structural ways to strengthen resilience of communities “and their assets, as well as the environment”. It also has direct relevance to Priority 4: which aims to enhance anticipation, response, recovery and reconstruction capabilities – “to build back better” - through integration of DRR with socio-economic planning and development.

Solomon Islands, as a least developed SID state, has identified key vulnerabilities in its National Adaptation Plan of Action. Among the key priorities is coastal protection – “to increase the resilience and enhance adaptive capacity of coastal communities, socio-economic activities and infrastructure”. The plan recognizes that “Coral reefs and Mangroves acts as buffer barriers zones protecting coastal communities and low lying areas from storms, tides, cyclones and storm surges and have important social and cultural importance.” The plan also recognizes that the health of the marine ecosystems is a major concern, particularly due to the links to food security and tourism. While financing is seen as an important element of the plan, most references are to the GEF LDCF an important source.^[2]

Indonesia actions to adapt to climate change aim to support efforts to: i) “adjust the strategy, policy, management, technology and attitude aimed at reducing the negative impacts of climate change and, if possible, to maximize its positive benefits.”, ii) reduce the nature (direct, indirect, continuous, discontinuous, and permanent) and rate of climate change impacts. The action plan acknowledges the need to pay attention to climate change resilience at the sectoral level, and to localize efforts, in particular to cover special regions such as “small islands, coastal and urban areas”. The plan emphasizes the need to strengthen economic resilience, especially as it pertains to livelihoods (referenced as social resilience), and “maintaining the sustainability of environmental services (ecosystem resilience)” and creation of a support system for knowledge, planning, budgeting, capacity building, monitoring and evaluation.^[3]

The Philippines National Climate Change Action Plan (2011-2028) prioritizes efforts to enhance “adaptive capacity and resilience of communities and natural ecosystems to climate, adopt a total economic valuation of natural resources while ensuring biodiversity conservation, and recognizes the competitive advantage of placing value on the direct use, indirect use, option to use and non-use of environment and natural resources, as a short to long-term sustainable development goal.” The plan identifies at outcome level, “Ecosystems protected, rehabilitated and ecological services restored”, and outlines a suite of actions for conservation, protection and management of protected and key biodiversity areas, and supports efforts to advance natural resource accounting methods in this connection. It also define another relevant outcome: “Enhanced adaptive capacity of communities, resilience of natural ecosystems, and sustainability of built environment to climate change”, which suggests the need for improved modelling and forecasting

efforts. The Philippines plan also identifies significant biases in climate financing towards mitigation efforts, and encourages increased actions to direct financing to adaptation measures – particularly “innovative climate financing”, including debt-for-nature swaps, disaster management funds, public financing mechanisms and payment for ecosystems services.[4]

The Fiji National Adaptation Plan of Action, identifies main climate hazards, including tropical cyclones, storm surges, droughts, and flooding events, and uses as benchmark the 2016 Severe Tropical Cyclone Winston, the most intense tropical cyclone ever in the Southern Hemisphere to make landfall, causing almost US\$ one billion in loss and damage, or 33 percent of national gross domestic product. While frequency is not likely to change, there are expectation of increasing intensity of such storms in future. The plan acknowledges that “Increasing local-level financing mechanisms, modalities, and fiduciary management would greatly enhance the ability of finance to flow to this level to support adaptation processes.” Some relevant priority adaptation measures under the plan include: i) climate information services and management, ii) climate modelling and mapping on sectoral basis, iii) strengthening sustainable fisheries management actions, including restoration, enhancement and conservation of coastal ecosystems such as mangroves, seagrasses and coral reefs, iv) climate-proofing waste and sanitation infrastructure, and v) protecting mangrove and coastal systems to reduce erosion of coastlines, reduce coastal protection costs, and support tourism.[5]

[1] <https://www.unisdr.org/we/coordinate/sendai-framework>

[2] Ministry of Environment, Conservation and Meteorology. National Adaptation Programmes of Action. 2008.

[3] BAPPENAS. National Action Plan for Climate Change Adaptation. 2013.

[4] Philippines Climate Change Commission. National Climate Change Action Plan 2011-2028.

[5] NAP Global Network. Republic of Fiji National Adaptation Plan: A Pathway Towards Climate Resilience. 2018.

8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

A knowledge management strategy will be elaborated during project preparation, and refined at project inception. It will combine elements of the ADB Finance ++ strategy, the UNDP Knowledge Management Strategy and the GEF approach to knowledge management. It will also draw on the STAP guidance on “Managing Knowledge for a Sustainable Future”.^[1] The strategy will expand on the elements outlined on Outcome 3.

Due to the high potential for innovative adaptation, the project will capture knowledge and experience emerging from the conceptualization, design, implementation and monitoring, and include challenges faces and emerging lessons. This would be for governments, communities, financing institutions, conservation organizations and technical implementation agencies.

In particular, the project will consider:

1. Documenting the experiences in these four countries, along with processes happening in at least 5 additional countries in the Meso-America and the Caribbean, to generate lessons learned and an updated version of the 'How to Insure Nature' Guide.
2. Developing methods to streamline the feasibility phase and information required to design an insurance product.
3. Sharing methods, guide and lessons learned among the countries to expand the experience, both to other implementing locations and in the wider global community. This sharing will be undertaken through multimedia approaches, including, but not limited to a suite of webinars and other online offerings.
4. Expand lessons, not just relevant for reefs, but for any valuable natural systems which provide a tangible benefit and face an insurable risk.

[1] Stocking, M. et al. 2018. Managing knowledge for a sustainable global future. Scientific and Technical Advisory Panel to the Global Environment Facility. Washington, DC.

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Ibu Laksmi DHEWANTHI	Senior Advisor to the Minister on Industry and International Trade	Ministry of Environment and Forestry	
Analiza Rebuelta - Teh	Undersecretary	Department of Environment and Natural Resources	
Chanel Iroi	Undersecretary - Technical	Ministry of Environment, Climate Change, Disaster Management and Meteorology	

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

INDONESIA



PHILIPPINES



Mapping coordinates for Solomon Islands and Fiji to be confirmed during project preparation