



Siargao Island Protected Landscape and Seascape *Management Plan* CY 2021-2030



I. INTRODUCTION

Sustainable development and environmental stability are among the main concerns of the Millennium Development Goals (MDGs) with regards to the environmental challenges faced by (a) the rapidly increasing population pressing natural resources to meet the growing demands for basic human needs such as food, shelter, livelihoods and settlements; (b) unregulated urbanization resulting from the growth of settlement areas and unsustainable use of land and water resources; (c) changes in land use and land cover, including the conversion of forest land for agricultural and non-agricultural purposes. These challenges have resulted in the destruction of forests and land degradation, soil loss and fertility depletion, water quality deterioration and loss of opportunities for biodiversity. The impacts of climate change that add strain on the atmosphere and negatively affect habitats and populations in various ways are added to these challenges.

The setting up of protected areas is a policy adopted by the Philippine Government for establishing ecological stability towards sustainable development and inclusive growth. This approach highlights the importance of conserving biodiversity. To stop the alarming rate of biodiversity loss resulting from the destruction of terrestrial, freshwater and coastal ecosystems, the creation of a protected area is regarded as a significant step (Brumer, et. al., 2001).

1.1. Philippines' Protected Area Management Plan: The Legal Basis

When the National Integrated Protected Areas System (NIPAS) Act or Republic Act (RA) 7586 was passed in 1992 by Congress, the protected area establishment in the Philippines was institutionalized. It was then amended by RA 11038 Expanded National Protected Area System (ENIPAS) on June 22, 2018 wherein 94 protected areas in the Philippines is declared as legislated protected area. The legislation provides for the creation and management of a comprehensive system of interconnected protected areas in order to ensure that all the flora and fauna required for the conservation of various ecological processes that are important to humans and for the stability of the ecosystem exist for the present and future generations. In addition, the NIPAS Act provides: (a) for the identification of protected area categories; (b) for the establishment of a standard planning process; (c) for the administration of the NIPAS by the Department of Environment and Natural Resources (DENR) and the PAMB, a multi-sectoral body responsible for deciding on issues relating to the management of protected areas; (d) for the recognition of ancestral rights; and (e) for the institutionalization of evaluation of environmental effects. Under this law, "all areas or islands in the Philippines proclaimed, designated or set aside, pursuant to a law, presidential decree, presidential proclamation or Executive Order as national park, game refuge, bird and wildlife sanctuary, wilderness area, strict nature reserve, watershed, mangrove reserve, fish sanctuary, natural and historical landmark, protected and managed landscape/seascape as well as identified virgin forests before the effectivity of this Act are hereby designated as initial components of the System".

The protected areas covered by NIPAS are listed and maintained as: (a) a strict nature reserve; (b) a national park; (c) a natural monument; (d) a sanctuary of wildlife; (e) a protected landscape and marine landscape; (f) a reserve of resources; (g) a natural biotic area; and (h) other categories defined by statute, treaties or international agreements to which the Government of the Philippines has consented and ratified them. There are prescribed collections of acceptable as well as forbidden human behaviours under each of these groups.

1.2. SIPLAS as a Protected Area: History and Future Implications

Before it was declared as a protected area under NIPAS, the biodiversity and economic importance of Siargao Islands were already recognized. It was included as part of the Surigao Mineral Reservation under Proclamation No. 391 on March 13, 1939, but was taken out of the reservation by Presidential Proclamation No. 721 on July 9, 1970. Presidential Proclamation Nos. 2151 and 2152 were issued on December 29, 1981, declaring the islands of Siargao, Poneas, Dahican, Tona, Liaonan, Abanay and Bancuyo all located at Dinagat sound in the province of Surigao del Norte as Wilderness Areas and islands of Siargao, Bucas Grande, Middle Bucos and East Bucas all located at Dinagat Sound in the province of Surigao del Norte as Mangrove Swamp Forest Reserve.

The Siargao Islands were included as an initial part of the Integrated Protected Areas System I (IPAS-1) after the enactment of the NIPAS Act. Due to its 9,370.125 hectares of mangrove areas, which were then the healthiest and most extensive in Mindanao, it was then designated as a wildlife sanctuary. It was chosen as one of the ten (10) priority protected area conservation sites that led to its declaration as Siargao Island Protected Landscape and Seascape (SIPLAS) by Presidential Proclamation No. 902 on October 10, 1996 and was further institutionalized after it was included in the list of protected areas in the Philippines by virtue of Republic Act 7586 as amended by Republic Act No. 11038 or the Expanded National Protected Areas System (ENIPAS) of 2018.

The declaration of SIPLAS is attributed to the biodiversity richness when it was named as one of the 128 Key Biodiversity Areas (KBAs) in the Philippines in 1996 and coded as KBA No.94 of which one (1) critically endangered, one (1) endangered, seven (7) vulnerable and twenty-two (22) restricted range species were identified as trigger species of SIPLAS. Also, SIPLAS which is located within the Mindanao Biogeographic Zone, is one of the 117 Important Bird Areas (IBAs) identified for the country by Haribon Foundation and Birdlife International. It is also identified as one of the 206 Conservation Priority Areas (CPAs) through the Priority-setting Program for the Philippine Biodiversity Conservation (*CI, DENR and PAWB, 2006*).

1.3. Updating process of SIPLAS – Protected Area Management Plan

In compliance with the requirements of the NIPAS Act, the initial SIPLAS Management Plan was formulated in 2001. An evaluation approach of consultation with local government units (LGUs) and other agencies and organizations working in the region prepared the management plan. This management plan was designed to direct the SIPLAS PAMB in the achievement of the goals and objectives of SIPLAS.

The first revision of the SIPLAS Management Plan was carried out under the supervision of the Philippines Climate Change Adaptation Project (PhilCCAP) in CY 2015. It was intended to assess recent changes in the protected area and to take into account the various challenges of climate change that threaten SIPLAS' ability to support the goods and ecosystem services it provides. The climate proofing of SIPLAS management plan is in accordance with RA 9729 or the Climate Change Act of 2009.

For CY 2020, the second revision and updating of SIPLAS Management Plan was carried out which enhanced the protected area planning process following the DENR-Biodiversity Management Bureau Technical Bulletin No. 2016-08 and was supplemented by the issuance of DAO No. 2019-05 also known as the Implementing Rules and Regulations of R.A No. 7586 as amended by R.A No. 11038 or the Expanded NIPAS. Such particular enhancements are illustrated in Figure 1 (in red italics) and become the basis in updating the

current plan. The SIPLAS Local Working Group (LWG) has actively participated the planning process especially in zoning and management prescriptions of the whole SIPLAS, such zones and prescriptions are needed to be synchronized with the latest LGU Comprehensive Land Use Plans (CLUPs). The updated SIPLAS Management Plan is designed for ten (10) year implementation.

As shown in Figure 1, collecting revised thematic maps, biodiversity studies and other biophysical and socio-economic information was the first critical step in updating the protected area plan. The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the DENR Mines and Geosciences Bureau (MGB) have obtained additional data on climate scenarios, as well as land cover and hazard maps. Resource uses and users or stakeholders, including organizations that involved in managing and controlling the resource use within the SIPLAS, have also been established. The overlay of thematic maps and data processing contributed to the identification of protected area challenges and possibilities.

SIPLAS vulnerability assessment focused on climate threats such as floods, landslides, sea level rise and storm surges. It included a general evaluation of the impact of rising temperatures on biodiversity. In view of the island's proximity to the Philippine Deep (or Philippine Trench), which is one of the deepest parts of the world, the susceptibility of southeastern coastal areas to the occurrence of tsunamis was also included. The assessment led to the identification of specific sites that are highly susceptible to one or multiple hazards, especially in downstream and coastal areas.

The LWG updated the vision, mission, goals and objectives for the SIPLAS management plan in a participatory and iterative manner through a series of planning workshops involving representatives of the different stakeholders who, themselves, defined challenges, issues and opportunities, integrating the need to increase the resilience of habitats and communities and livelihoods to the impacts of climate change. Strategies were then designed and ironed out to fulfil the vision, priorities and goals. The key management strategies include the concept of Strict Protection Zones (SPZ) and Multiple Use Zones (MUZ) with resource management criteria that address biodiversity conservation issues, local communities' livelihoods and socio-economic needs, and the vulnerability of both ecosystems and communities to climate change. The protection and conservation and investment programs built for the SPZ and MUZ illustrate how they mitigate the impacts of climate change or enable climate change to adapt to ecosystems and communities.

Intensive awareness raising, the creation of sustainable financing schemes for unique management programs such as Payment for Environmental Services (PES), strengthening governance structures through capacity building, collaborations between the Protected Area Management Board (PAMB) and stakeholders, linkages with support agencies, effective policy support, and the implementation of a results-based Monitoring and Evaluation (M and E) framework to capture the final main outputs and outcomes of the different interventions and investments are among the support implementation strategies introduced.

The draft management plan was presented to the nine (9) LGUs and representatives of the SIPLAS PAMB at various points during the planning phase. It was also presented to the technical staff of the DENR Regional Office and submitted to the DENR-Biodiversity Management Bureau (BMB) for affirmation.

The plan was finalized and presented to the SIPLAS PAMB, after a series of public consultations and meetings during which the Updated SIPLAS Management Plan: CY 2021-2030 was approved involving the process as shown in Figure 1.

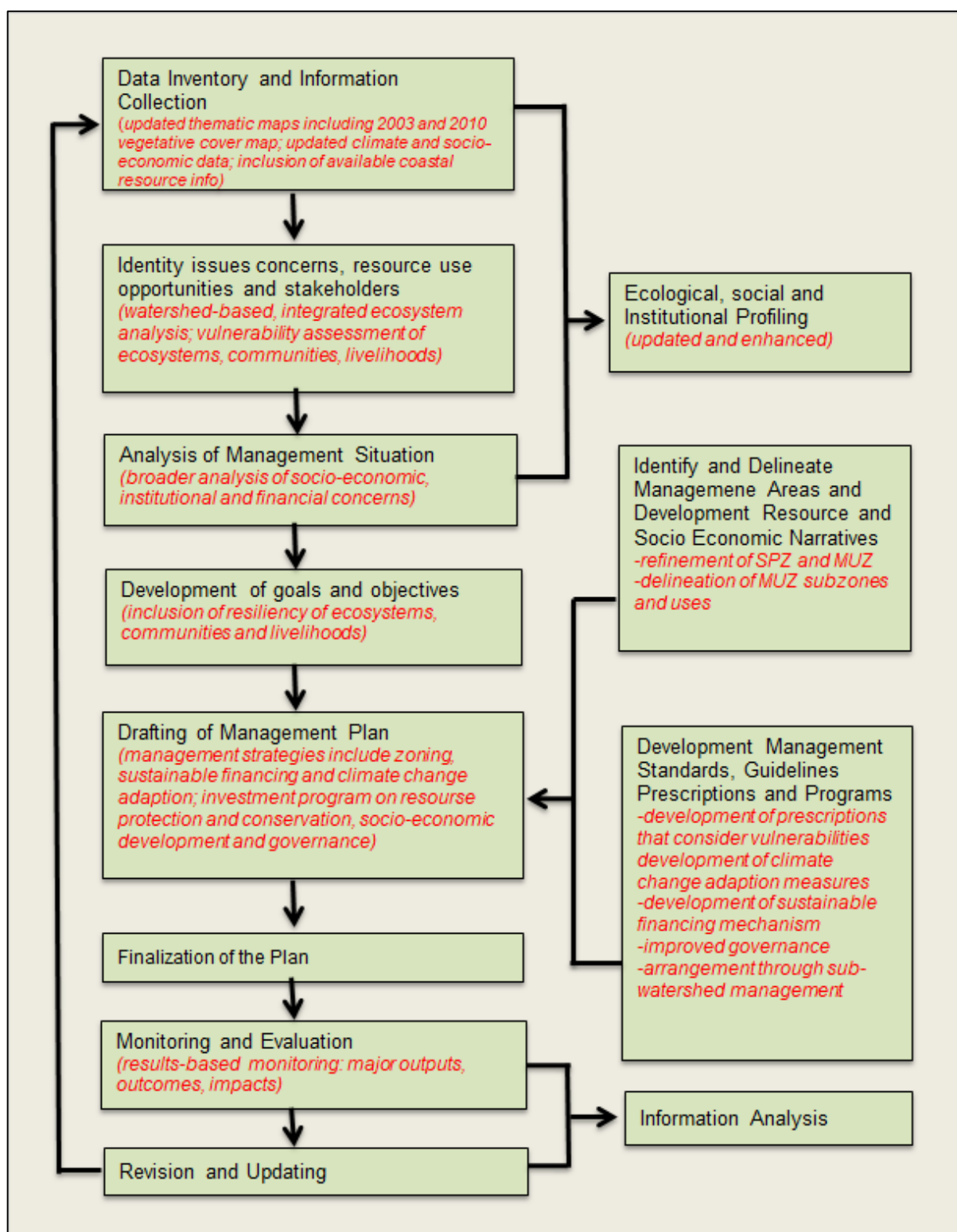


Figure 1. Process of Updating the SIPLAS Management Plan

Source: DENR-Biodiversity Management Bureau, Technical Bulletin No. 2016-08

1.4. SIPLAS Management Plan CY 2015-2020 Accomplishments

The accomplishment of project activities and programs described in the five (5) year SIPLAS Management Plan CY 2015-2020 are summarized in Table 1.

Table 1. SIPLAS Significant Accomplishment CY 2015-2020.

Programs per 5-year action plan of CY 2015-2020 SIPLAS MP	Major Accomplishment
Terrestrial Management Program	Biodiversity Protection and Conservation <ol style="list-style-type: none"> 1. 28 scientific research were endorsed by the SIPLAS PAMB; 2. 6,142.8 hectares were rehabilitated through National Greening Program; 3. 223 caves and 92 wetlands inventoried; 4. Six (6) caves and six (6) wetlands assessed; 5. Three (3) caves and five (5) wetlands have an approved management plan; and 6. Established four (4) terrestrial and four (4) coastal BMS sites with quarterly monitoring
	Socio-Economic Development Programs <ol style="list-style-type: none"> 1. Conducted SRPAO in Socorro and SEAMS in San Isidro and Burgos; 2. Nine (9) PACBRMA with Community Resource Management Plan (CRMP); 3. 11 SAPA holders; 4. 1,713 hectares Agroforestry plantation; and 5. One (1) Small Water Impounding System in Brgy. Esperanza, Del Carmen, SDN 6. Six (6) BDFEs implemented
Coastal and Marine Management Programs	Coastal Habitat and Species Conservation <ol style="list-style-type: none"> 1. Seagrass Assessment and Monitoring in CY 2017, 2019, and 2020; 2. Artificial and coral reef monitoring; 3. Mangrove Assessment in CY 2019 and 2020; 4. MPA Quarterly Monitoring; 5. Marine Protected Area Networking (MPAN); 6. Mangrove and Beach Forest Development Project (MBFDP) implemented; 7. Siargao Inter-Agency Law Enforcement Cooperation (SIALEC) re-activated; 8. Quarterly LAWIN System Patrol; and 9. Established five (5) monitoring stations
	Socio Economic Development/ Alternative Livelihood Support Programs <ol style="list-style-type: none"> 1. Livelihood projects under CMEMP distributed to nine (9) PO's
Cross-Cutting Management Programs	Ecotourism Development <ol style="list-style-type: none"> 1. SIPLAS Ecotourism Management Plan; 2. Site Specific Ecotourism Management Plan;

Programs per 5-year action plan of CY 2015-2020 SIPLAS MP	Major Accomplishment
	<ol style="list-style-type: none"> Skills training conducted for the implementing PO and LGU; and Established and Maintained Protected Area Facilities
	<p style="text-align: center;">Waste Management</p> <ol style="list-style-type: none"> LGU Solid waste management plan; and Task Force Siargao Operation in General Luna and Dapa, Surigao del Norte
	<p style="text-align: center;">Communication, Education and Public Awareness (CEPA)</p> <ol style="list-style-type: none"> SIPLAS Communication Plan CY 2019-2023; Annual production and distribution of CEPA materials; SIPLAS Biodiversity Conservation and Campaign Logo; and MOA between DENR Caraga and Rare Philippines Inc.
	<p style="text-align: center;">Development of Sustainable Financing Scheme</p> <ol style="list-style-type: none"> Integrated Protected Area Fund (IPAF) Collected; and 15 resolutions passed by the SIPLAS PAMB relating to financing scheme
Governance Enhancement and Institutional Strengthening Programs	<p style="text-align: center;">Knowledge and Capability Building for PAMB and PASu Office</p> <ol style="list-style-type: none"> PAMB members attended several orientations and PA conferences; and PASu and APASu attended learning events
	<p style="text-align: center;">Collaboration and Resource Mobilization</p> <ol style="list-style-type: none"> NGO Conservation efforts Conducted 41 Executive Committee and <i>En Banc</i>; Passed 676 SIPLAS PAMB Resolutions; and Passed 19 policy agendas
	<p style="text-align: center;">Monitoring and Evaluation of Plan Implementation</p> <ol style="list-style-type: none"> Impact monitoring of Sohoton Cove (CY 2016-2018); Impact monitoring of Sugba Lagoon (CY 2019-2020)

Source: SIPLAS PAMO Comprehensive Narrative Accomplishment Report in Implementation of SIPLAS Management Plan CY 2015-2020, CY 2020

Details of the accomplishments are elaborated in the already submitted Comprehensive Narrative Accomplishment Report in the implementation of SIPLAS Management Plan CY 2015-2020.

II. DESCRIPTION OF SIARGAO ISLAND PROTECTED LANDSCAPE AND SEASCAPE

2.1 Bio-Physical Profile

2.1.1 Area, Location and Access

Siargao Island Protected Landscape and Seascape (SIPLAS) is located in the northeastern part of Mindanao specifically within the Dinagat Sound. The Philippine Deep, known as the deepest part of the world at 11,094 meters below sea level, is located along the southeast coast of SIPLAS. It is one of the three (3) legislated protected areas in Region XIII (Caraga Region).

SIPLAS covers an area of 283,974.77 hectares wherein the 62,796 hectares represent the terrestrial area consists of 48 islands and the two (2) largest islands Siargao Island and Bucas Grande Island, whereas, the remaining 227,296.77 hectares belongs to the coastal and marine area which compose of mangrove, seagrass beds, shallow and deep coral reef areas, and pelagic area.

SIPLAS covers nine (9) municipalities with a total of 132 barangays all in the province of Surigao del Norte. The nine (9) municipalities are the following: Burgos Dapa, Del Carmen, General Luna, Pilar, San Benito, San Isidro, Santa Monica, and Socorro. The municipality of Socorro is the only municipality which is located in the Bucas Grande Island. Table 2 shows the land area of the nine (9) municipalities in SIPLAS. The administrative map of SIPLAS is shown in Figure 2.

Table 2. Land Area by Municipality

Municipality	Area (ha)
Burgos	1,938.3
Dapa	8,993.3
Del Carmen	15,066.1
General Luna	5,500.6
Pilar	6,112.1
San Benito	4,410.7
San Isidro	4,527.3
Socorro	12,593.7
Sta. Monica	3,654.0
Total	62,796

Sources: Natural Resource Assessment (NRA), Ecotown Project, 2011;
SIPLAS PAMO generated map

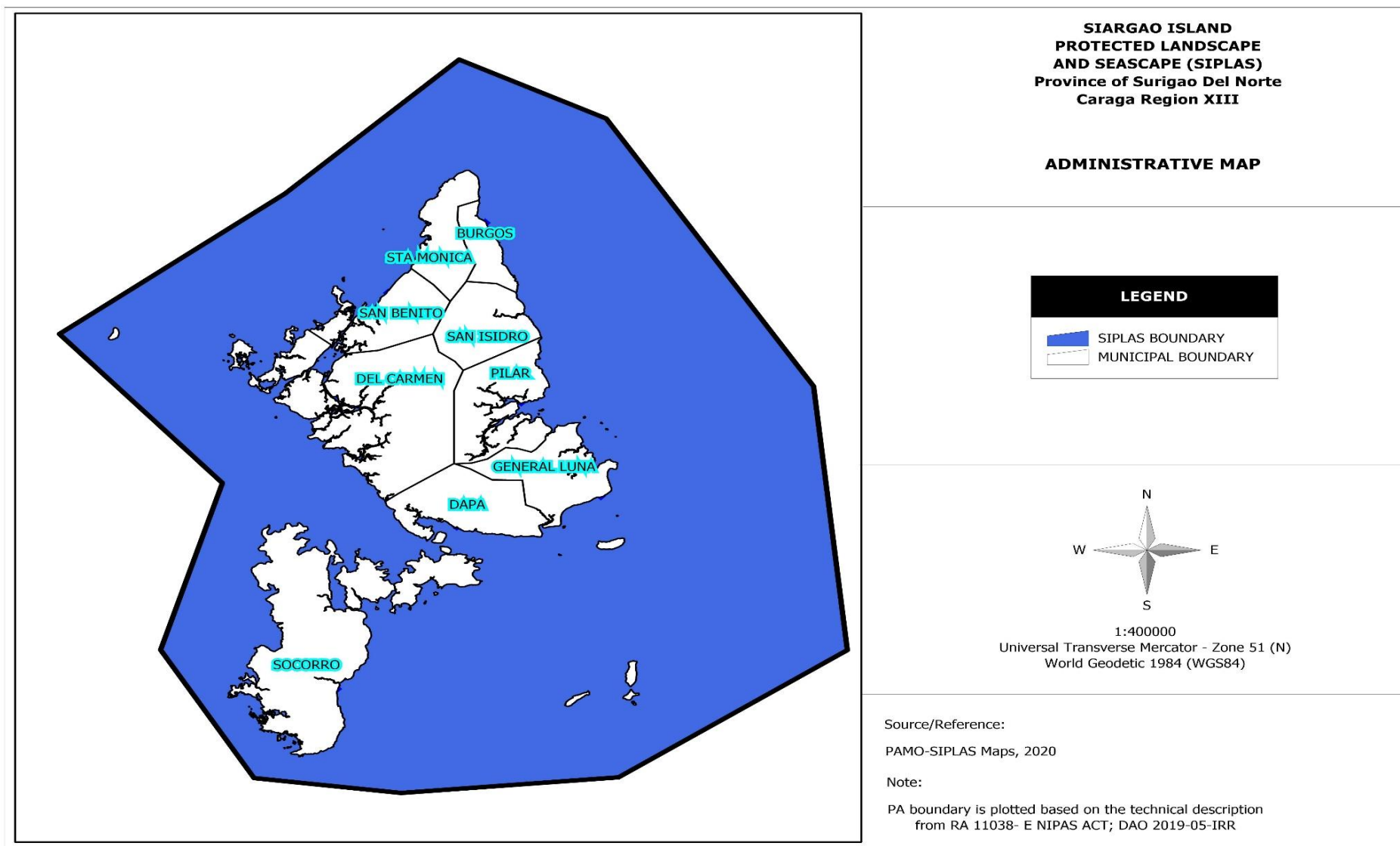


Figure 2. Administrative Map of SIPLAS

Source: SIPLAS PAMO, CY 2020

The municipalities in SIPLAS can be accessed from Surigao City by boarding commercial and passenger ferry vessels as well as inter-island motor vessels. There are four (4) major ports within SIPLAS which are utilized by commercial vessels. These are located in the municipalities of Del Carmen, Dapa, Socorro and Santa Monica. Meanwhile, there are boats and passenger ferry vessels which traverse between the mainland Surigao City and the municipality of Dapa. Other ports also offer inter-island motor vessel services. Direct commercial flights from cities of Davao, Cebu, Manila to Siargao Island operate on a daily basis in Sayak Airport at Barangay Sayak, Del Carmen.

Public and private transportation (van, mini bus operated by DATSCO, Public Utility Jeep, multicab, center-motorbike and tricycle) and motorbikes locally known as *habal-habal* are available for travel within the islands of Siargao and Bucas Grande. Coastal and island barangays are dependent on motorized and non-motorized boats that pass between the small islands and the two (2) main islands.

2.1.2 Topography and Slope

The terrain ranges from the following: level to nearly level, gently sloping to undulating, undulating to rolling, rolling to moderately steep and steep. The area distribution according to slope is given in Table 34 and is shown in Figure 3. Almost 80% (~79.18%) of the area has slopes of level to nearly level and gently sloping to undulating slopes (below 8% slope category). About 18.97% of the area has undulating to rolling slopes (8-18 percent slope category). About 1.60% has rolling to moderately steep slopes (18-30 percent slope category). Only about 0.03% of the area has steep slopes (30-50 percent slope category).

The highest elevation in the island is at 283 meters above sea level (masl) and is located in the southeast part of Socorro, Bucas Grande Island. In Siargao island, the highest elevation is around 250 masl, which is found in barangay Sta. Fe in Dapa, and in barangay Antipolo and Cabugao in Del Carmen as shown in Figure 4. Since surface stream flows are diverted into underground channels, there is no significant surface drainage system in the island.

Table 3. Distribution of Areas by Slope Category

Slope Category	Description	Area (hectares)	% to Total
0-3 percent	Level to nearly level	28,516.57	45.41%
3-8 percent	Gently sloping to undulating	21,208.48	33.77%
8-18 percent	Undulating to rolling	11,913.06	18.97%
18-30 percent	Rolling to moderately steep	1,002.85	1.60%
30-50 percent	Steep	17.94	0.03%
Outlier		137.10	0.22%
Total		62,796.00	100.00%

Source: Slope map of Siargao Islands (SIPLAS Management Plan, CY 2015)

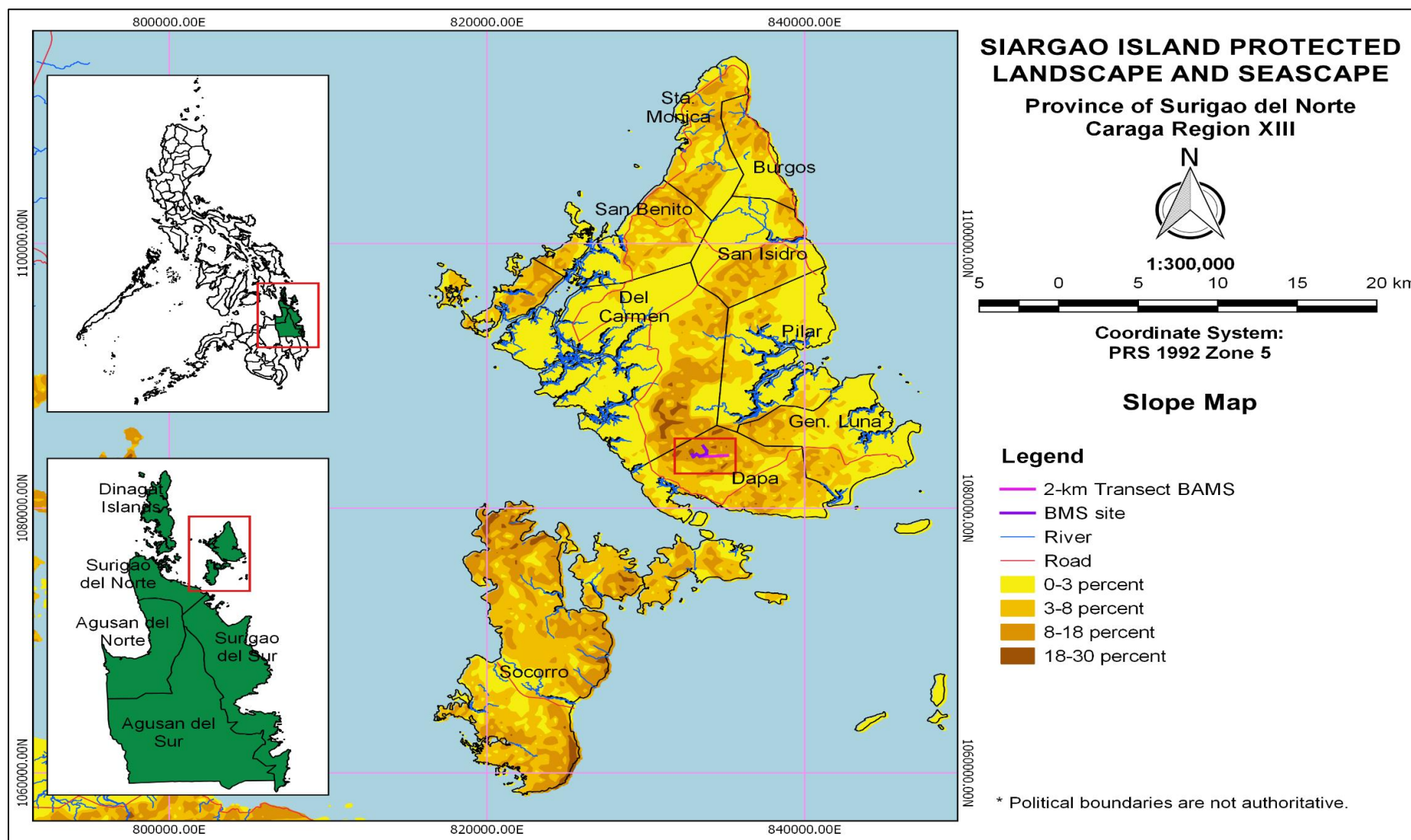


Figure 3. SIPLAS Slope Map

Source: Slope map of Siargao Islands (SIPLAS Management Plan, CY 2015)

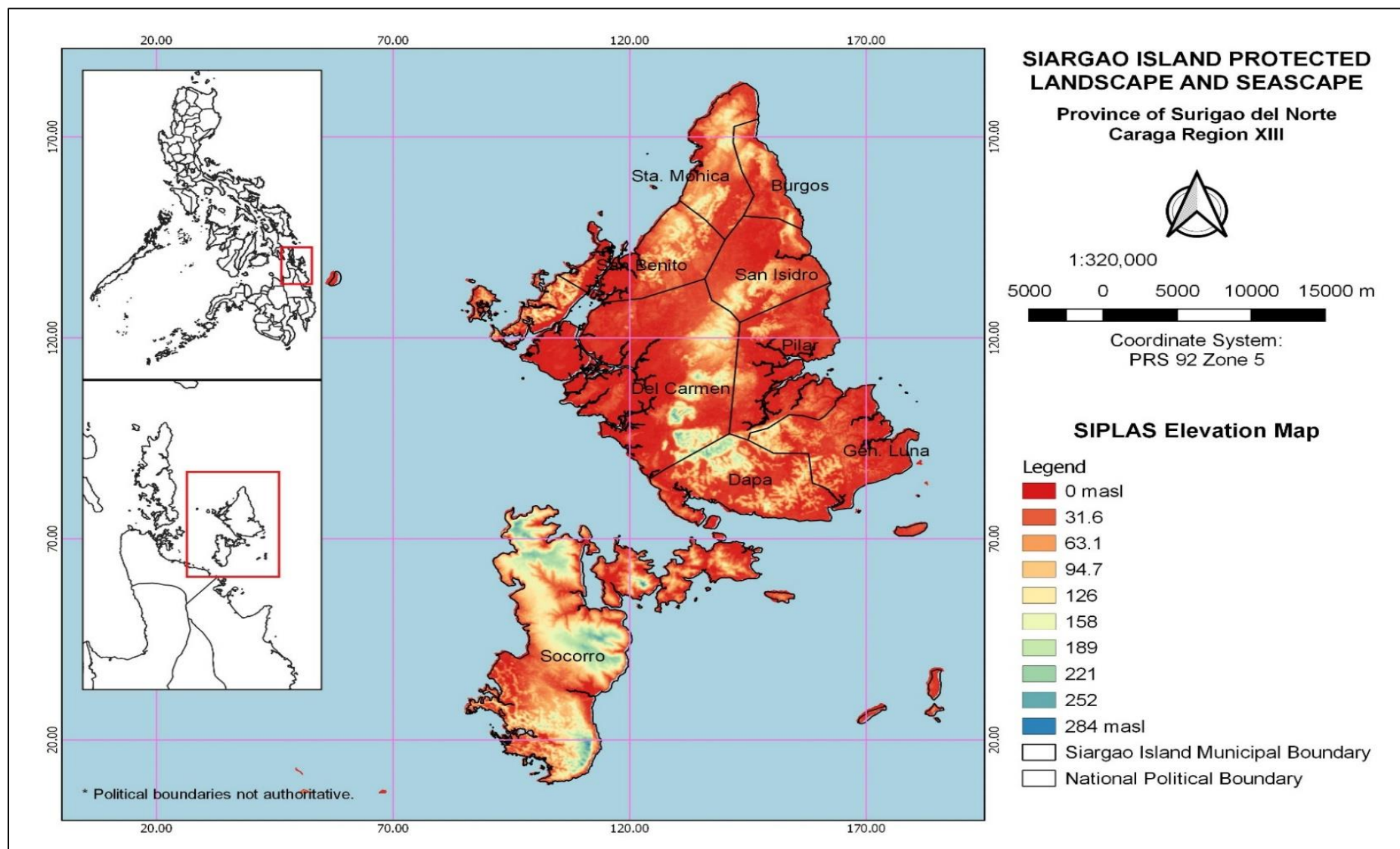


Figure 4. SIPLAS Elevation Map
 Source: SIPLAS Management Plan, CY 2015

2.1.3 Geology and Soils

The limestone areas particularly in *Kangbangyo* and *Poneas* Islands are the most remarkable physiographic features of SIPLAS. These limestone areas typically show a mountain range landscape of haystack hills that appear to be a combination of Bohol's Chocolate Hills and Palawan's El Nido limestone formations. Amid the hills and beaches, the presence of ponds and lagoons makes them quite interesting. The collapse of the roof of caverns and galleries due to erosion and dissolution could have contributed to the formation of these ponds and lagoons.

In the center of the island, *sapao* formation is found which consists of volcanic rocks exhibits a rolling to moderately steep topography with a more or less uniform slope. In the central portion and the coastal areas of the island, the alluvium can also be found. These areas have formed as a result of deposition both from the land and sea.

Table 4 presents the cover by soil type within Siargao and Bucas Grande islands. In Siargao Island, the soil types are the following: 80% Bolinao clay, 10% Bolinao Clay steep phase, 5% Jamoyaon clay loam, and 5% undifferentiated soil types. While in Bucas Grande island, the soil types present are the following: 60% Kabatohan clay and 40% Bolinao Clay steep phase. The soil map of SIPLAS is shown in Figure 5.

Bolinao clay is one of the most dominant soil types found in SIPLAS. This soil is characterized as clayish and typically shallow resulting from shale rock weathering. The surface is a dense layer of dark gray clay (15 to 40 centimeters thick) that is sticky and plastic when wet and the substratum is a large layer of shale rock. Bolinao clay is ideal to use for diversified farming with proper fertilization, organic matter addition, planting timing, effective irrigation system, among others (Sarimong, 2016). In the steep slopes and denuded areas, soil erosion is observed. Gullies have also been formed where there is a heavy flow of water.

Table 4. SIPLAS Soil Types

LOCATION	PERCENTAGE	BY SOIL TYPE
Siargao	80%	Bolinao Clay
	10%	Bolinao Clay, Steep Phase
	5%	Jamoyaon Clay Loam
	5%	Others
Bucas Grande	60%	Kabatohan Clay
	40%	Bolinao Clay, Steep Phase

Source: Provincial Development and Physical Framework Enhancement Plan 2018-2027 (Surigao del Norte)

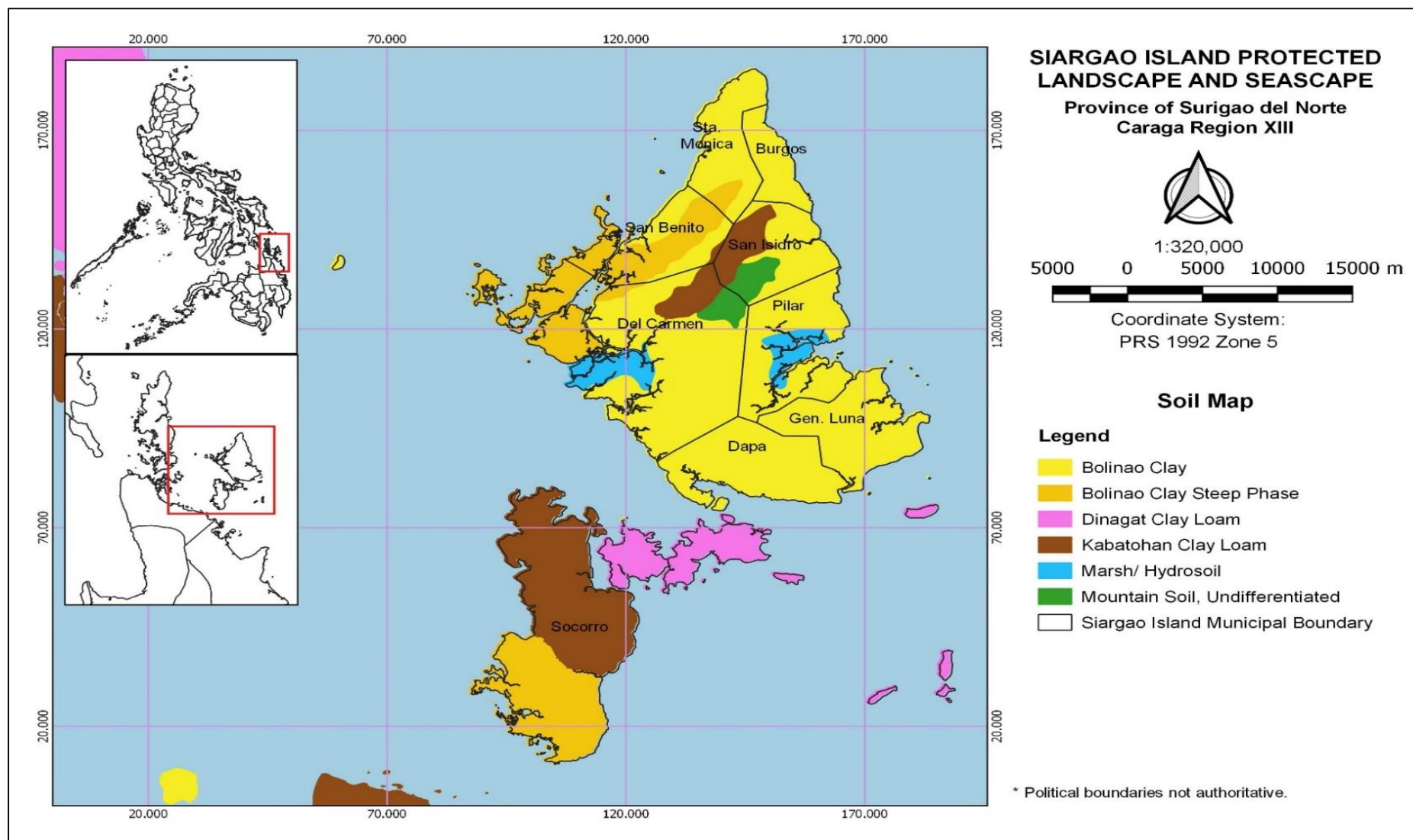


Figure 5. Soil Map of SIPLAS

Source: SIPLAS Management Plan, CY 2015

2.1.4 Land Classification and Tenure

Table 5 and Figure 6 present the land classification within SIPLAS. SIPLAS has a total land area of 62,796 hectares. Approximately 24,337 hectares within SIPLAS is classified as Alienable and Disposable (A and D) lands, while 38,459 hectares are classified as timberland or forestland. Out of the 132 barangays in SIPLAS, forty-two (42) are situated within forestland.

Table 5. SIPLAS Land Classification

Municipality	Land Area (hectare)	Alienable and Disposable (A&D) in hectare	Timberland (hectare)
Burgos	1,948	1,516	432
Dapa	8,934	4,574	4,360
Del Carmen	15,191	4,322	10,869
General Luna	5,551	3,539	2,012
Pilar	5,837	1,423	4,414
San Benito	4,429	1,131	3,298
San Isidro	4,538	2,531	2,007
Sta. Monica	3,691	2,749	942
Socorro	12,677	2,552	10,125
TOTAL	62,796	24,337	38,459

Source: Provincial Development and Physical Framework Enhancement Plan 2018-2027 (Surigao del Norte)

A total of 1,077 household-occupants which occupy around 2,134 hectares were previously awarded with Certificates of Stewardship Contract (CSCs). There are only 115 remaining CSCs that will expire on CY 2021 with a total area of 267.15 hectares. After which no more renewal of CSC in SIPLAS.

The most recent tenure instruments issued by the DENR is Protected Area Community-Based Resource Management Agreements (PACBRMAs) covering 2,203 hectares and 222.54 hectares in the municipalities of Socorro and Dapa, respectively. Table 6 presents the tenure instruments issued within SIPLAS.

Table 6. Tenure Instruments Issued within SIPLAS

Tenure	Area (hectares)
ISF/CSC	267.15
PACBRMA	2,425.54
Total	2,692.69

Source: DENR SIPLAS PAMO, CY 2020

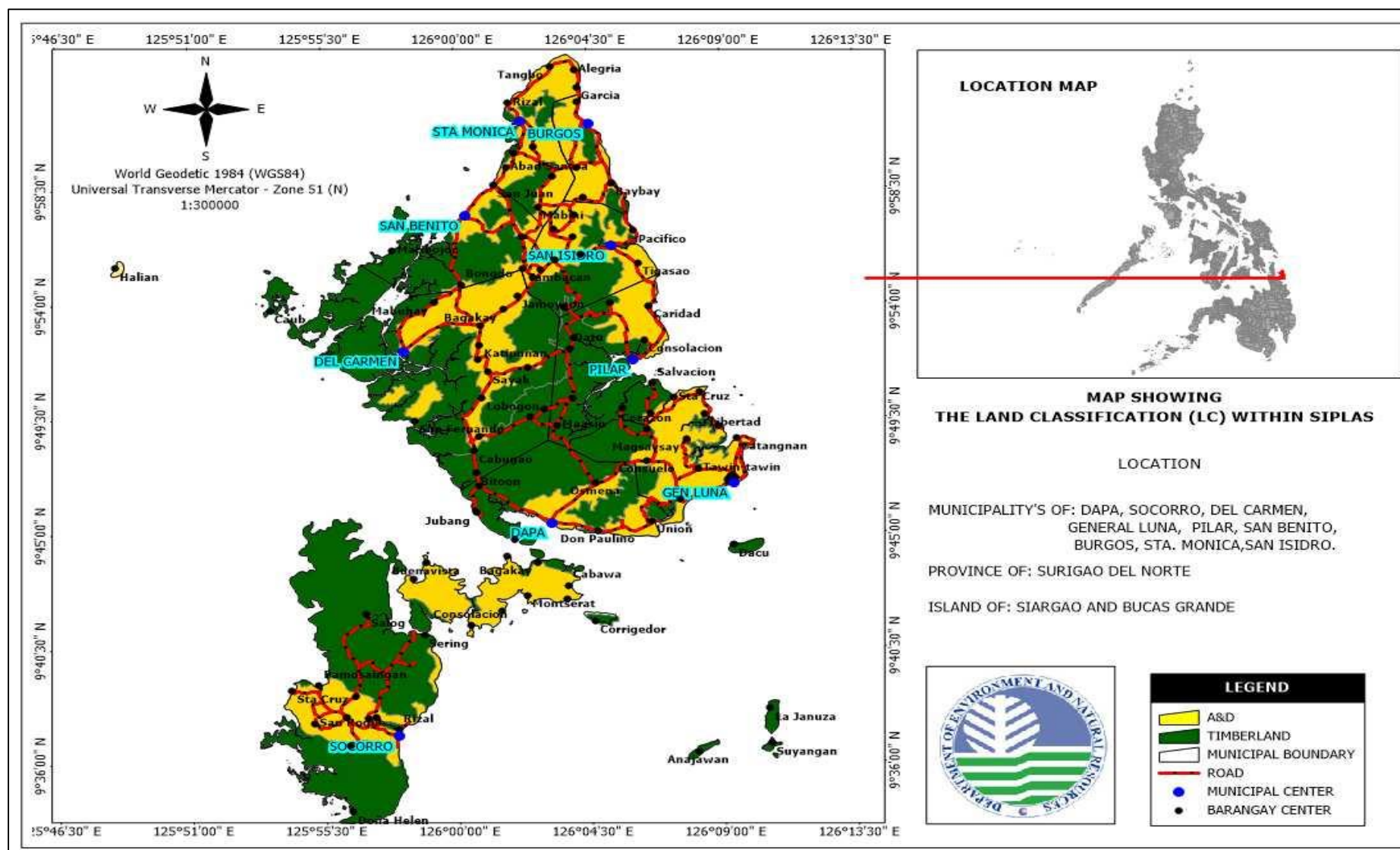


Figure 6. SIPLAS Land Classification

Source: Land Classification Map, DENR 13; Ecotown Project (2011) as cited in SIPLAS Management Plan CY 2015

2.1.5 Land Cover

This management plan's land cover data was collected from a number of sources. Although DENR and the National Mapping and Resource Information Authority (NAMRIA) officially published the Philippine Land Cover map in CY 2010, LWG decided to adopt the 2011 Ecotown Project of the Climate Change Commission's land cover data. The map of NAMRIA 2010 shows that there are no more natural forests on the island of Siargao. Large areas of natural forests that still remain in Socorro, for example, are represented as shrublands on the NAMRIA map. It is likely because these forests are usually stunted due to their exposure to wind from the eastern seaboard.

Natural forests in both Socorro and Del Carmen are dominated by the important and rare Philippine iron wood or *mancono*, which grows to a height range between 5-10 meters and is mistaken for shrub lands. The NAMRIA map was "corrected" in the Ecotown Project map to represent the results of field validation and field observations from local communities.

The CY 2011 land cover data of Ecotown Project reveals that 7,886.20 hectares or 12% of Siargao Islands' total land cover are natural broadleaved forest. These are mostly found in Socorro (36%), Dapa (29%) and Del Carmen (26%). Mangrove forest covers approximately 7,768 hectares or 12% of total land cover. Most of the mangrove forests are located in Del Carmen (4,295 ha or 55%), Pilar (1,217 ha or 16%) and San Benito (1,010 ha or 13%). However, per SIPLAS PAMO Assessment CY 2020, estimated mangrove cover is 9,370.125 hectares as shown in Table 18.

About 39,878 hectares or 64% of the land cover, however, are croplands most of which (32,230 hectares) are planted with perennials such as coconut. The croplands of Del Carmen comprise 21% of total croplands in Siargao Islands. Second to Del Carmen in terms of crop production is Dapa which has 13% of total croplands.

The total land area in SIPLAS is 62,796 hectares. The 38,459 hectares composed the timberland area of which 4,984.50 is broadleaved close forest and 2,901.70 is broadleaved open forest with a total area of 7,886.20 hectares as shown in Table 8.

The BAMS CY 2018 looked at the resource stratification map. It appears that closed forests are wanting in SIPLAS. The remaining closed forest are confined only in small patches in the southern tip of Socorro, as well as in Del Carmen, Dapa, and a very small fragment in General Luna. Likewise, open forests were found in Dapa, Socorro, and Pilar. This could be due, but not limited, to unchecked illegal activities, such as timber poaching and charcoal-making in the area.

Albeit, the absence of forests doesn't mean that the watershed condition is impaired (DENR-FMB, n.d.), however the role of trees and forests, for instance, in microclimate regulation, such as reducing storm water and removing or filtering pollutants, cannot be dismissed. It is widely known that forests filter and regulate the flow of water, in large part due to their leafy canopy that intercepts rainfall, which slows its fall to the ground. The forest floor, likewise, acts like an enormous sponge, which can absorb up to 18 inches of precipitation (depending on soil composition) before it will gradually release the water to natural channels and recharges ground water. Figure 7 shows the watershed resource map per BAMS CY 2018.

Table 7. Land Cover Statistics of the Siargao Islands: 2011

Land Cover	Burgos	Dapa	Del Carmen	General Luna	Pilar	San Benito	San Isidro	Socorro	Sta. Monica	Total	% Share
Closed forest, broadleaved	12.4	234.8	1,915.7	122.8		543.6	11.7	2,143.4		4,984.5	8.0%
Open forest, broadleaved		1,937.7			51.5			540.4		2,529.7	4.0%
Mangrove Forest		698.9	4,295.0	111.4	1,216.2	1,009.8	160.4	195.2	81.1	7,768.6	12.4%
Other wooded land, shrubs	9.3					14.6	3.7	1,109.5		1,137.1	1.8%
Other wooded land, wooded grassland								1,440.60		1,440.6	2.3%
Other lands, annual crop	119.5	945.0	1,359.0	785.4	718.8	68.9	764.8	2,507.20	378.3	7,647.0	12.2%
Other lands, perennial crop	1,701.3	4,217.6	7,135.9	4,196.2	3,631.6	2,588.6	3,496.5	2,221.5	3,041.3	32,230.5	51.6%
Other lands, grass land	23.6	554.5	0.9	0.6	7.1	1.5	8.2	2,161.00	60.1	2,817.5	4.5%
Other lands, built-up area	47.4	255.4	252.6	152.8	92.7	122.6	61.0	171.2	77.7	1,233.4	2.0%
Other lands, barren land		5.6	37.5	2.7	2.2		3.3	5.8		57.0	0.1%
Other lands, marshland	13.3									13.3	0.0%
Inland water	0.2	143.8	69.5	128.7	56.5	60.9	8.3	97.7	9.0	574.7	0.9%
Inland water, inland water pond	11.3				5.9		9.4		4.5	31.1	0.0%
Inland water, fishpond					22.4				2.1	24.5	0.0%
Inland water, inland water pond	11.3				5.9		9.4		4.5	31.1	0.0%
Outlier					306.8					306.8	
Total	1949.6	8993.3	15066.1	5500.6	5810.8	4410.5	4536.7	12593.5	3658.6	62,796.2	100.0%

Source: Natural Resource Assessment (NRA), Ecotown Project, 2011 (SIPLAS Management Plan, CY 2015)

*Excluding outlier

Table 8. Forest Cover Statistics in SIPLAS (Ecotown Project 2011)

Municipality	Closed Forest, broadleaved	Open Forest, broadleaved
Burgos	12.4	-
Dapa	234.8	1,937.70
Del Carmen	1,915.70	-
General Luna	122.8	-
Pilar	-	51.5
San Benito	543.6	-
San Isidro	11.7	-
Socorro	2,143.40	540.4
Sta. Monica	-	372*
TOTAL	4,984.50	2,901.70

Source: Natural Resource Assessment (NRA), Ecotown Project, 2011 (SIPLAS Management Plan, CY 2015); *CLUP of Sta. Monica

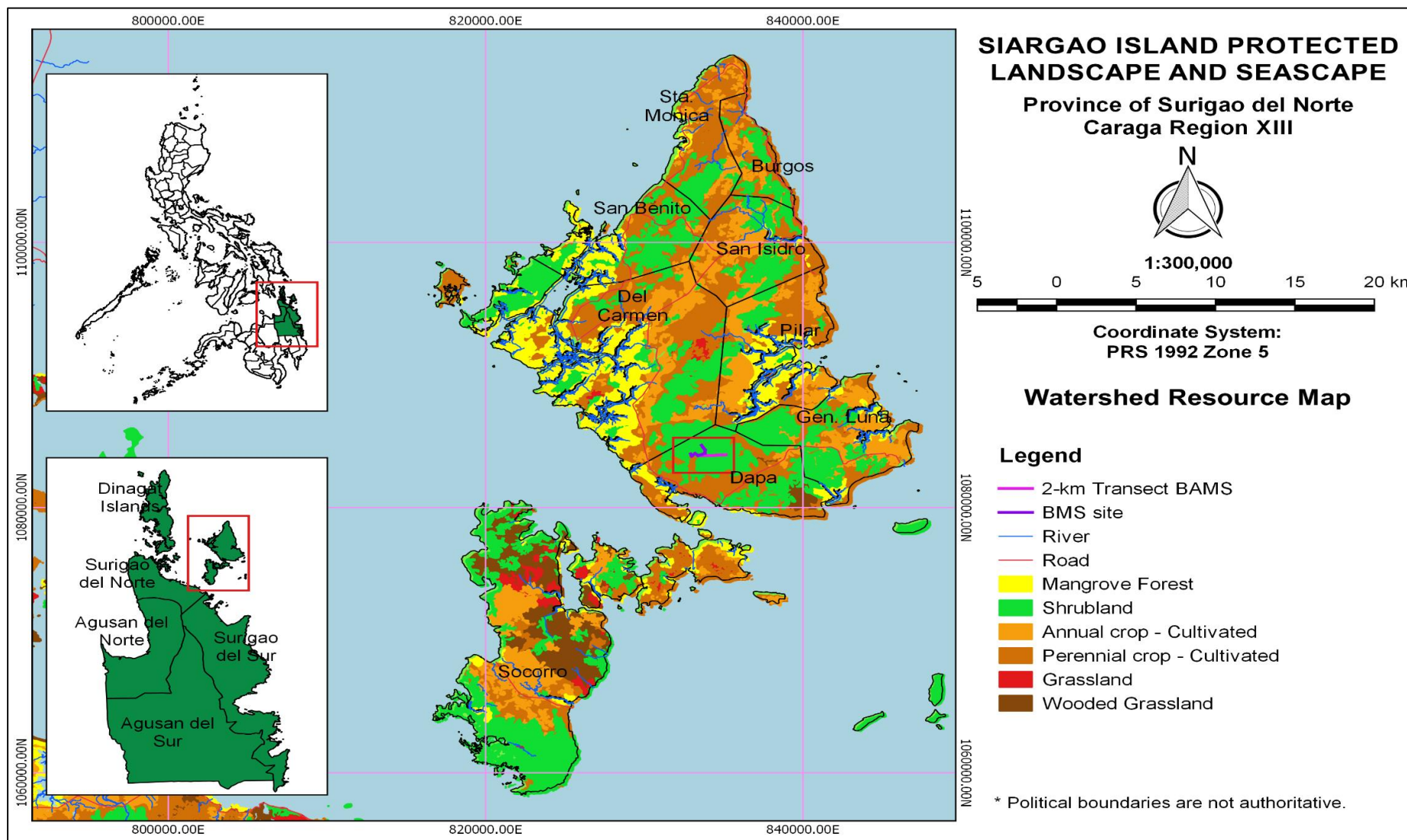


Figure 7. Watershed Resource Map in SIPLAS per BAMS CY 2018

Source: Biodiversity Assessment Monitoring System (BAMS), CY 2018

2.1.6 Climate

The climate in SIPLAS is characterized by having no dry season with a very pronounced rainy season from November to January. This falls under Type II climate according to the Modified Corona's Classification (MCC) of Climate as shown in Figure 8. It is affected mainly by the northwesterly and southwesterly winds, though over several months, the winds may vary. *Amihan* or the northeast monsoon produces high waves during the months of October to February. It is during these months that quite a number of surfing enthusiasts are attracted to the island for surfing and breaking activities along the eastern coastline. While, the month of June to September is known as *Habagat* or the southwest monsoon.

The highest rainfall in SIPLAS occurs during December and the driest month is in June. The month of February usually had the lowest temperature at 26.6°C while the months of May and June had the highest temperature at 28.4°C. Table 9 summarizes the annual average rainfall, the minimum and maximum temperatures and the relative humidity in SIPLAS from CY 2010-2019. In 2019, SIPLAS had an average relative humidity of 81.9%, while, the average rainfall in 2019 is at 2,167.9 mm. Lastly, the average temperature in 2019 is at 28.4°C with a minimum temperature of 24.4°C and maximum temperature of 32.3°C.

Table 9. Annual Average Rainfall (mm), Maximum and Minimum Temperature (°C), and Relative Humidity (%) in Siargao Islands: 2015-2019

Year	Rainfall (mm)	Maximum Temperature (°C)	Minimum Temperature (°C)	Relative Humidity (%)
2015	3186.8	32.2	23	81
2016	2910.2	32.4	24.1	81
2017	4692.1	31.9	24.3	84
2018	4120	32.2	24.4	84
2019	2167.9	32.4	24.5	82

Source: DOST-PAGASA, CY 2020

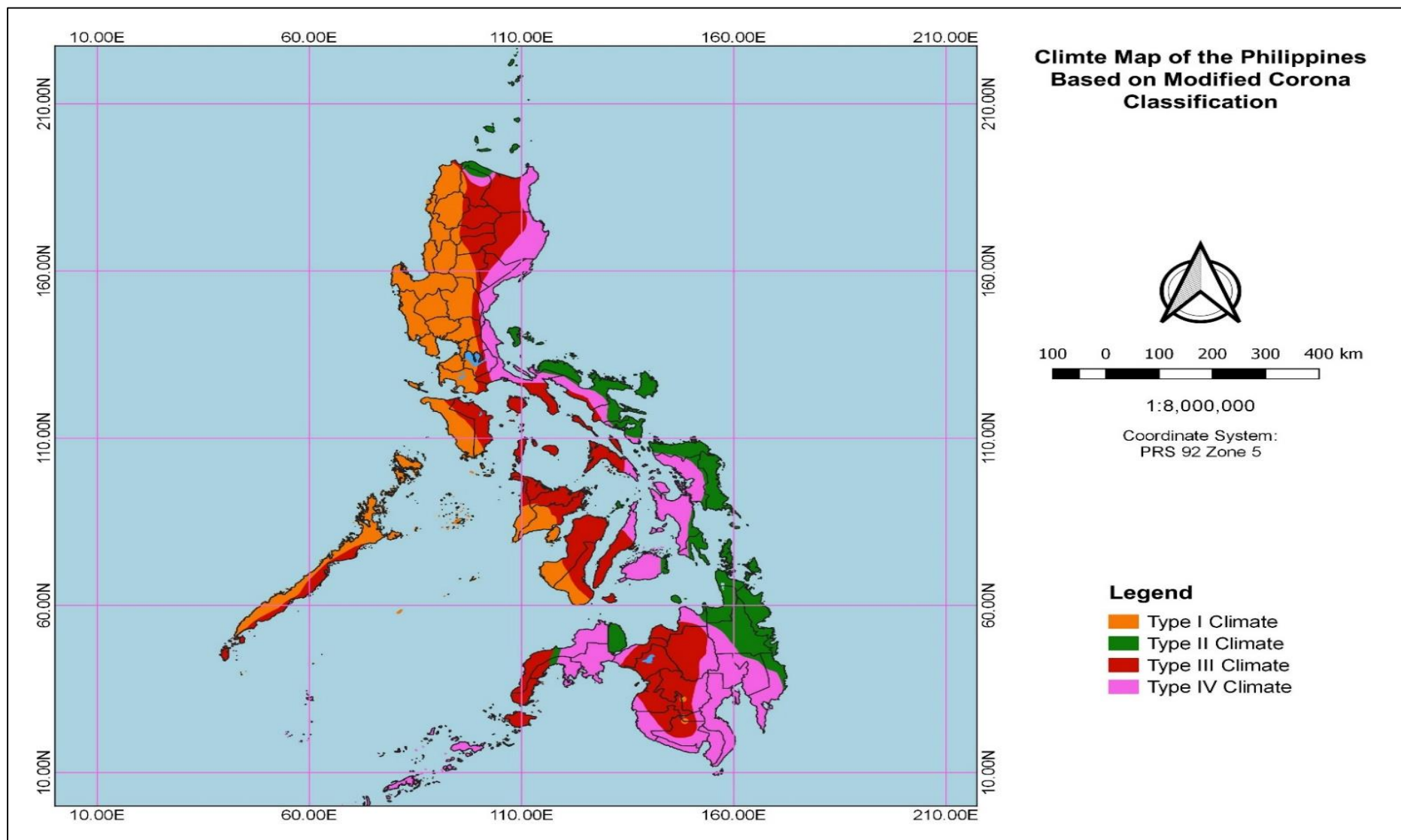


Figure 8. Climate Map of the Philippines based on Modified Corona Classification

Source: PAG-ASA and SIPLAS Management Plan CY 2015

2.1.7 Hazard Areas

SIPLAS are threatened by both geologic hazards and climate change-related hazards. Geologic hazards include earthquakes caused by seismic activities along the Philippine Deep which could trigger a tsunami. The climate-related hazards that the islands are exposed to include temperature increases, irregular rainfall patterns, sea level rises, and more severe, extreme events such as floods, droughts, landslides, and storm surges associated with strong typhoons. It is anticipated that these hazards will have significant effects and impacts on agriculture and systems of food production, human settlements, livelihoods, ecosystems and biodiversity. Chapter 3 delves further into SIPLAS' susceptibility to these hazards.

2.1.8 Biological Diversity and Resources in SIPLAS

The biodiversity richness of SIPLAS cannot be underestimated. Out of the 10 KBAs in Region XIII with a total area of 866,813 hectares, SIPLAS comprises 33.4% of these. SIPLAS also compose 21.7% of the 3.843 million hectares of all Mindanao KBAs. Endemism of its terrestrial faunal diversity is noteworthy. SIPLAS is home to 21 mammal species of which 14 are endemic to the Philippines, 85 bird species of which 55 species or 65% are endemic to the country and nine (9) endemic species of frogs.

Table 10 shows the Key Biodiversity Areas located in Region XIII (CARAGA), including Siargao Island Protected Landscape and Seascape.

Table 10. Key Biodiversity Areas (KBAs) in Region XIII (Caraga)

KBAs in Region XIII	Area (in hectares)	Percentage
Mt. Kambinliw and Redondo	28,524	3.3%
Siargao Islands PLS	283,974.77*	32.8%
Carrascal Bay	2,823	0.3%
Consuelo and General Islands	2,530	0.3%
Mt. Hilong-Hilong	240,240	27.7%
Cagwait	1,886	0.2%
Mt. Diwata Range	93,798	10.8%
Hinatuan Bay	17,268	2%
Bislig	154,829	17.9%
Agusan Marsh Wildlife Sanctuary	40,940.96*	4.7%
Total	866,813.73	100.0%

Source: Eastern Mindanao Framework Plan CY 2008

*RA 11038 or ENIPAS Act CY 2018

a. Terrestrial and Freshwater Biological Resources

Terrestrial and Freshwater ecosystems are interactive systems within which biotic species and their growth and adaptation, and associated biological productivity, nutrient cycling, and energy flows among inland aquatic microbial, plant and animal communities, are integrated with their environment. These inland waters include lakes, reservoirs, rivers, streams, and wetlands.

Terrestrial/Freshwater Habitats

In terms of terrestrial diversity, it is with moderate value of Shannon index, 2.5-2.99 for SIPLAS PAMO BAMS CY 2018. In Siargao Islands, there are nine (9) terrestrial and freshwater habitats. These are the following:

1) Closed and Open Forest

As of 2011, the remaining closed and open forest in Siargao was reported to be 7,886.20 hectares, with only 2,901.70 hectares of open forest. The patches of these forests can be found in all Siargao municipalities. With around 4,986.50 hectares or 43% of the total closed forest of which Socorro covers the largest area of closed forest. The remaining natural forests are dominated by the rare mancono (*Xanthosthemum verdugonianus*) and other dipterocarps such as the *yakal*, *lauan* and *gisok*. There are sufficient flora saplings and a grouping of species of avifauna in these forests as well.



Figure 9. Open forest in Lobo, Catabaan, Dapa, Surigao del Norte

2) Ultramafic Forest

Igneous rock formations which formed from volcanic residues characterize this terrestrial habitat. Siargao has about 1,137 hectares of ultramafic forest covered primarily with stunted and premium tree species, including the *mancono*. This type of habitat is found in Bucas Point, Bucas Grande Island and parts of San Benito, Del Carmen and Santa Monica. In this type of forest, the soil fertility is loam barren and acidic because of the presence of mineral deposits such as cobalt, copper, silver, manganese, chromite, and gold.

3) Limestone Forest

This forest is marked by the predominance of karst stone formations on the islets. A few distinctive rock formations can be found in Kangbangyo Point in Maribojoc, San Benito. Unique rock formations can also be sighted in the islets in Socorro and Del Carmen, hilltop lakes, and the popular Sohoton Cave in Socorro. Lastly, a skull-like formation can be found in Magpupungko, Pilar. Per SIPLAS PAMO BAMS CY 2018, the limestone forest is classified as intermediate of early and advance second growth and is home to flora and fauna diversity.



Figure 10. Limestone islet in Sohoton Bay, Socorro, SDN

4) Shrubland and Grassland

Siargao has 4,258 hectares of mostly unproductive grasslands and shrublands. These areas cover some acidic parts of Siargao and Bucas Grande and include areas further devastated by grass fires in the western part of Bucas Grande. These areas have become barren and are dominantly colonized by cogon grass and ferns which are locally known as *agsam*.

5) Caves

There are 564 caves documented in SIPLAS, 20 of which are considered major caves (Protected Area Suitability Assessment, CY 1994). Currently, SIPLAS PAMO inventoried 236 caves on CY 2019 and CY 2020. Caves act as the center of the islands' bat colony. They provide shelter and habitat for fruit-eating bats and other invertebrate species. The cave ecosystem thus hosts a number of species, swiftlets, and invertebrates. These species depend on the cave ecosystem for their survival. In the forest ecosystem, cave species serve as effective pollinators and seed dispersers and play a vital role in preserving diversity. Table 11 showed the summary list of unclassified caves by municipality, while a detailed list is presented in Annex 5 as a result of cave inventories between the year 2019-2020.

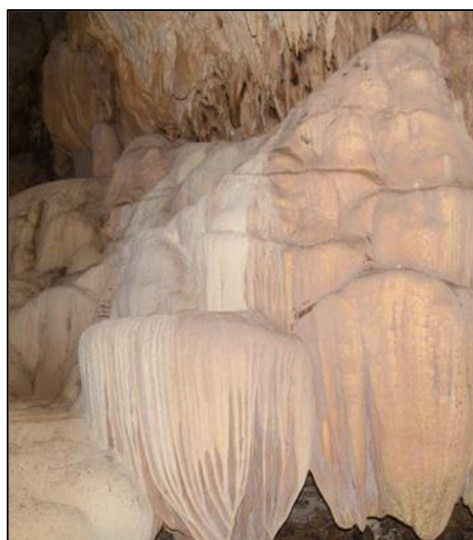


Figure 11. Flowstones in Patag Cave in Burgos, Surigao del Norte

In addition, Table 12 presented the classified caves in SIPLAS and its located in different municipalities as reflected in Figure 12 showing their respective classification status.

Table 11. Summary of unclassified caves in SIPLAS

MUNICIPALITY	NO. OF CAVES INVENTORIED
Burgos	12
Dapa	25
Del Carmen	40
General Luna	6
Pilar	18
San Benito	30
San Isidro	7
Sta. Monica	27
Socorro	57
TOTAL	222

Source: Cave Inventory Report, CY 2019 and 2020.

Table 12. List of classified caves in SIPLAS as of CY 2020

MUNICIPALITY	No.	Name of Cave	Classification	Location	Classification Status	Year Assessed	Remarks
				Barangay			
Burgos	3						
	1	Somyot Cave	Class II	Pob. 2	DMC 2018-02	2016	w/ Mgt. Plan (2018)
	2	Patag Cave	Class II	Pob. 2	DMC 2018-02	2016	w/ Mgt. Plan (2019)
	3	Ilihan Cave	Class II	Pob. 1	DMC 2018-02	2016	
Socorro	6						
	1	Crystal Cave	Class II	San Roque	PAMB Resolution No. 2017-84	2017	
	2	Bolitas Cave	Class II	San Roque	PAMB Resolution No. 2017-84	2017	
	3	Tondan Cave	Class II	San Roque	PAMB Resolution No. 2017-84	2017	
	4	Sapaggetti Cave	Class II	San Roque	PAMB Resolution No. 2017-84	2017	
	5	Hagukan Cave	Class III	Sudlon	PAMB Resolution No. 2017-84	2017	
	6	Magkukuob Cave	Class II	Sudlon	PAMB Resolution No. 2017-84	2017	
Sta. Monica	3						
	1	Libertad Cave 1	Class II	Libertad	DMC 2012-08		
	2	Libertad Cave 2	Class II	Libertad			
	3	Danjug Cave	Class III	Tangbo	PAMB Resolution No. 2020-133	2020	
Del Carmen	1						
	1	Caub Cave	Class II	Caub	PAMB Resolution No. 2019-02	2018	
Pilar	1						
	1	Tayangban Cave	Class II	Datu	PAMB Resolution No. 2019-124	2019	With Mgt. Plan (2020)
TOTAL	14						

Source: DENR-PENRO SDN List of Classified Caves, CY 2020

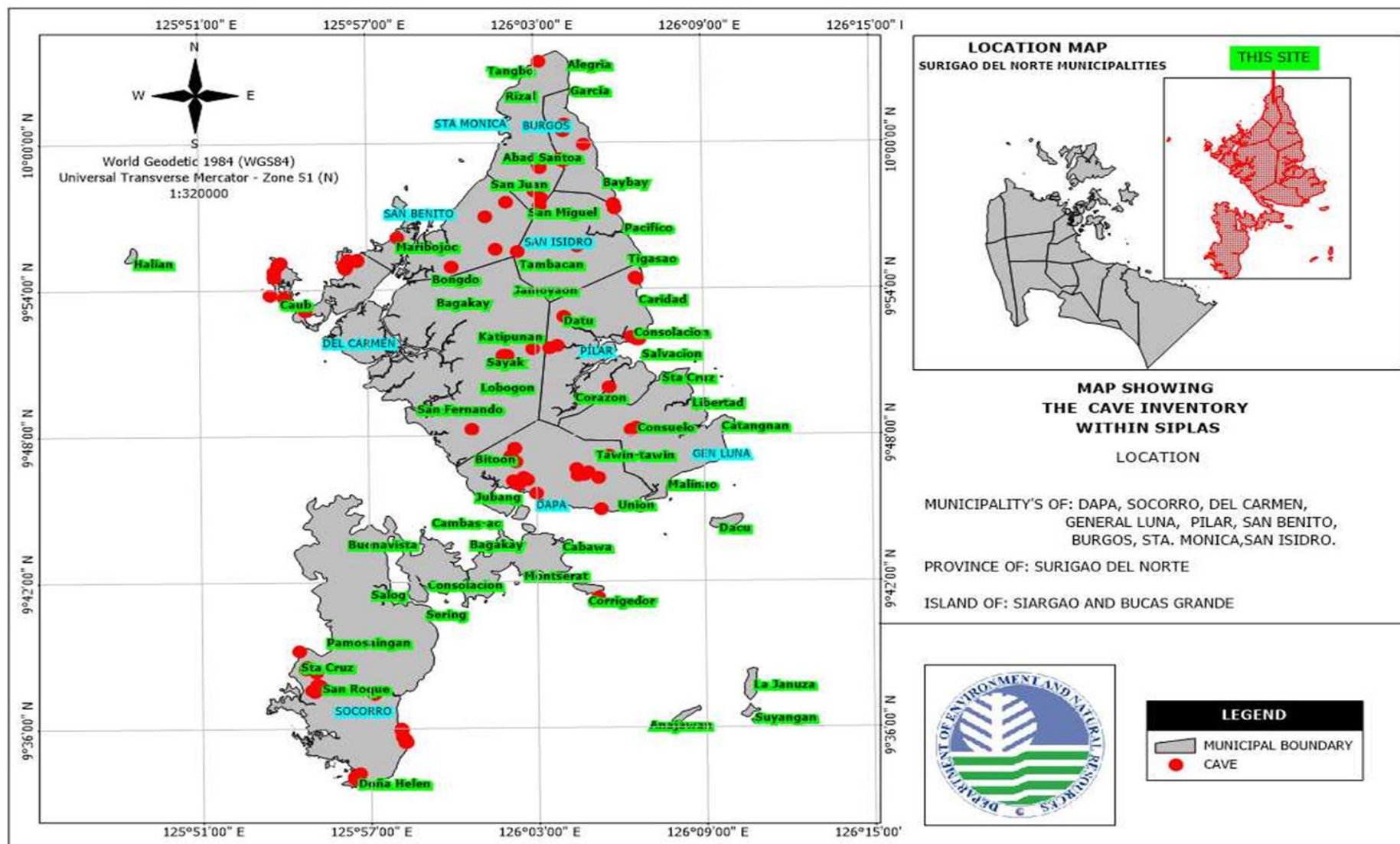


Figure 12. Caves Inventoried in SIPLAS CY 2019-2020

Source: SIPLAS PAMO CY 2019 and CY 2020

6) Beach Forest.

The forest of this type is dominated by species of *talisay*, *bitaug* and *dap-dap* growing along the stretches of fine white sand beaches. Table 13 shows the number of beach forest species per municipality. These forests are usually located in the municipality of General Luna particularly in Malinao, Poblacion barangays, Catangnan, Daku Island, Suyangan, Anajawan, La Janusa, and Pansukian. There are also beach forests in Barangay Alegria of Sta. Monica; Caridad and Magpupungko of Pilar; Bitaug and Baybay of Burgos; Tigasao and Pacifico of San Isidro; islands of Kankangon, Pagbasayan and Barangay Maribojoc of San Benito; islets at Doña Helene, San Roque, Sohoton Bay and Puyangi of Socorro; Kawhagan, Halian, Tagbuyakhaw and Caub of Del Carmen; Union, Don Paulino, Corregidor and Monserat of Dapa. The beach forest is home to twenty-three (23) different bird species and endangered turtles including the green sea turtle, *Chelonia mydas*. Detailed list of classified beach forest species is presented in Annex 7.



Figure 13. Punta Beach, Burgos, Surigao del Norte

Table 13. Beach forest species found in SIPLAS

Municipality	Number of Identified Beach Forest Species
Dapa	67
Pilar	67
Del Carmen	60
General Luna	51
San Benito	42
Burgos	36

Source: Primavera et al. 2018. Inventory of Beach Forest Species in Siargao Island Protected Landscape and Seascape Surigao del Norte, Philippines

7) Wetlands

➤ **Streams, Lagoons and Rivers**

In Siargao Islands, visible streams and small rivers can be found and listed in Table 14. There are also lakes, lagoons and other freshwater ponds. Recent study of land cover reveals that there are approximately 575 hectares of inland fresh waters consisting mainly of small streams, ponds, lagoons and lakes. As of CY 2019 Wetland Inventory in SIPLAS, there are nineteen (19) rivers listed. One of the most popular lagoons is the Poneas Hilltop Hidden Lagoon, a mountain top lagoon home to a variety of freshwater fish species in San Benito and Sugba Lagoon in Del Carmen.

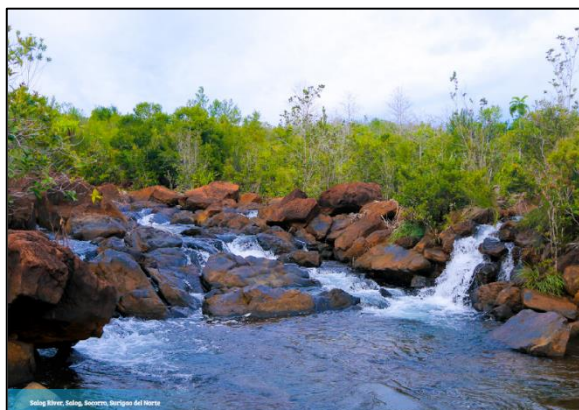


Figure 14. Salog River, Brgy. Salog, Socorro, Surigao del Norte



Figure 15. Maasin River at Brgy. Maasin, Pilar, SDN

Table 14. List of rivers in Siargao Island Protected Landscape and Seascape (SIPLAS)

WETLAND SITE NAME	WETLAND TYPE	WATERBODY CLASSIFICATION	BARANGAY	MUNICIPALITY	COORDINATES		REMARKS
					Latitude	Longitude	
Balingo River	River	Class B	Datu	Pilar	9.859592	126.058421	Serve as public bath
Datu River	River	Class B	Datu	Pilar	9.869417	126.063435	Serve as public bath
Maasin River	River	Class B	Maasin	Pilar	9.8215	126.056272	Serve as public bath
River	River		Libertad	Sta. Monica	9.98535	126.05578	Community Canal
River 1	River	Class C	Conrado	Socorro	9.647683	125.934512	Perennial River; Source of farmlot irrigation
River 2	River	Class C	Conrado	Socorro	9.650113	125.935245	Perennial River; Source of farmlot irrigation
River 3	River	Class C	Conrado	Socorro	9.65124	125.935818	Perennial River; Source of farmlot irrigation
River 4	River	Class C	Conrado	Socorro	9.651507	125.936503	Perennial River; Source of farmlot irrigation
River 5	River	Class C	Conrado	Socorro	9.690903	125.933861	Perennial River; Source of farmlot irrigation
River 6	River	Class C	Conrado	Socorro	9.652067	125.945573	Perennial River; Source of farmlot irrigation
River	River	Class A	Estrella	Socorro	9.624045	125.949917	Perennial River; community water source
Suba	River	Class C	Pamosaingan	Socorro	9.647272	125.921392	Perennial River
Suba	River	Class C	Songkoy	Socorro	9.627802	125.950215	Perennial River; used for irrigation
Suba 2	River	Class C	Songkoy	Socorro	9.626625	125.950645	Perennial River; used for irrigation
Suba 1	River	Class C	San Roque	Socorro	9.629265	125.919191	Perennial River; used for irrigation
Suba 2	River	Class C	San Roque	Socorro	9.62899	125.919302	Perennial River; used for irrigation
River	River	Class B	San Miguel	San Isidro	9 57 24	126 3 54	Used as public bath and irrigation
Patag River	River	Class C	Poblacion 1	Burgos	10.007578	126.067695	Used for irrigation
Sayak River	River	Class C	Sayak	Del Carmen	9 51 19	126 1 15	Used for irrigation

Source: SIPLAS-PAMO Inventory of Inland Wetland CY 2019

➤ **Marshes and Swamps**

These are considered freshwater ecosystems that serve as water basins and therefore help prevent flooding in the islands during heavy rainfall. *Kaatu-an bangkal* dominates the broad marshes situated in Matin-ao and San Mateo, Burgos; Jaboy, Pilar as shown in Figure 16; Consuelo, General Luna; Cancohay, Del Carmen; Union and Osmeña in Dapa; and Pelaez, San Miguel and Buhing Kalipay, San Isidro. The most common fish species caught in these areas is mudfish. There are a few marshes and swamps listed during the SIPLAS PAMO inland wetland inventory on CY 2019 as shown in Table 15. Figure 17 present the inland wetland in SIPLAS.



Figure 16. Paghungawan Marsh in Brgy. Jaboy, Pilar, Surigao del Norte

Table 15. List of marshland and swamps in SIPLAS

WETLAND TYPE	WATERBODY CLASSIFICATION	BARANGAY	MUNICIPALITY	COORDINATES		REMARKS
				Latitude	Longitude	
Swamp	Class C	Consuelo	Dapa	9.799318	126.106338	Grassland; used as Fishpond; Egrets spotted
Swamp	Class C	Sitio Lobo, Brgy. 12	Dapa	9.786977	126.035407	Serve as wallows
Marshland	Class C	Don Paulino	Dapa	9.753375	126.095348	
Marshland	Class C	Osmeña	Dapa	9.794525	126.093817	No infrastructures built
Marshland	Class C	Osmeña	Dapa	9.794543	126.093262	No infrastructures built
Marshland	Class C	Osmeña	Dapa	9.79298	126.09109	No infrastructures built
Marshland	Class C	Osmeña	Dapa	9.791165	126.090475	No infrastructures built
Marshland	Class C	Osmeña	Dapa	9.790407	126.090418	No infrastructures built
Marshland	Class C	Osmeña	Dapa	9.789503	126.090082	No infrastructures built
Marshland	Class C	Osmeña	Dapa	9.787197	126.088188	No infrastructures built
Marshland	Class C	Osmeña	Dapa	9.78231	126.076703	No infrastructures built
Marshland	Class C	Osmeña	Dapa	9.782782	126.075673	No infrastructures built
Marshland	Class C	Jaboy	Pilar	9.891637	126.077263	No infrastructures built
Marshland	Class C	Bitoon	Del Carmen	9 47 11	126 0 43	Marshland Assessed
Marshland	Class C	Cancohay	Del Carmen	9 53 23	126 0 32	
Marshland	Class C	Cancohay	Del Carmen	9 53 41	126 0 15	
Marshland	Class C	Del Carmen	Del Carmen	9 52 57	126 59 1	
Marshland	Class C	Mabuhay	Del Carmen	9 53 37	125 58 53	

Source: SIPLAS PAMO Inventory of Inland Wetland, CY 2019

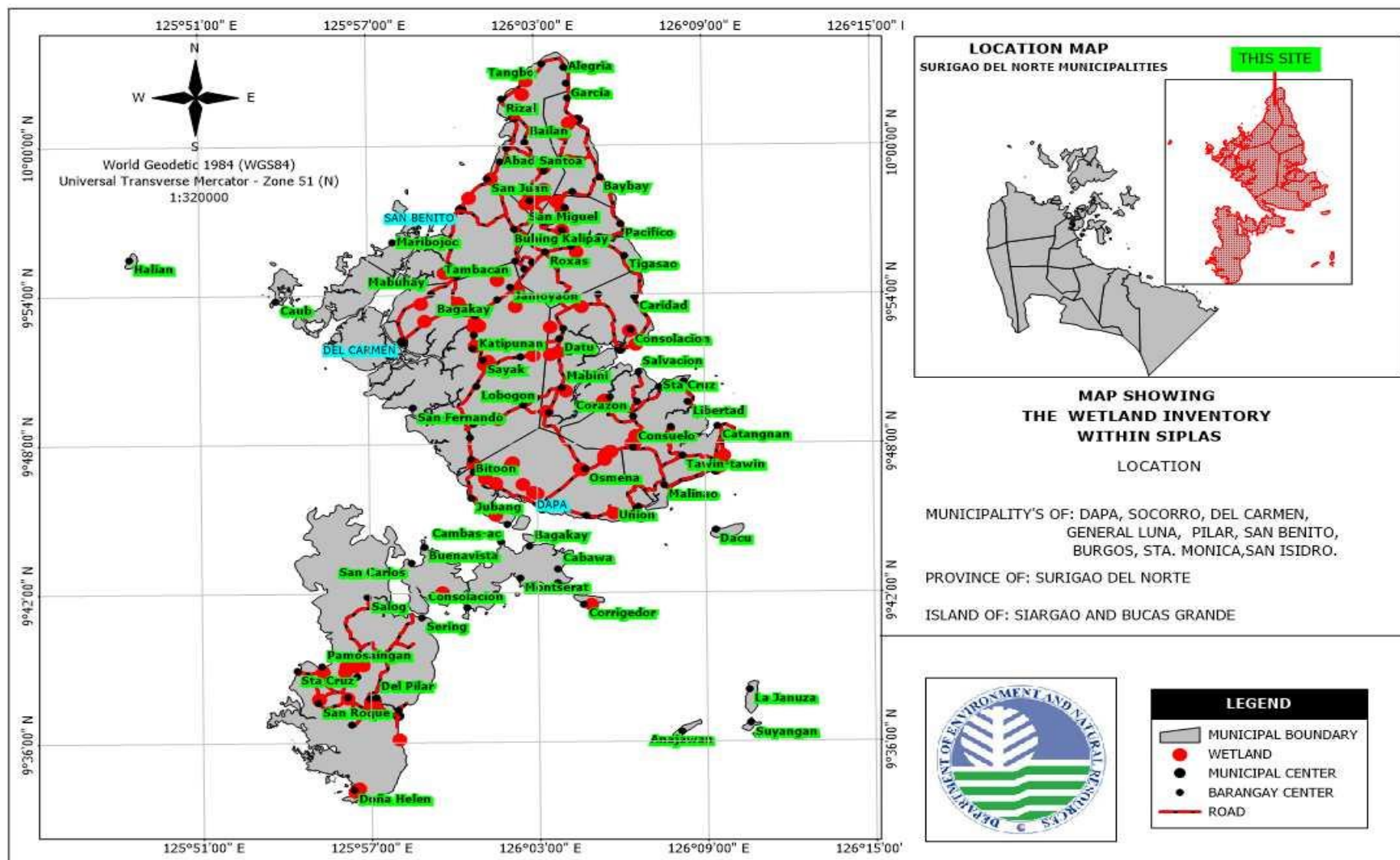


Figure 17. Inland wetland Inventory Map in SIPLAS CY 2019

8) Agriculture areas.

Currently, about 39,877 hectares are dedicated to agricultural production. Coconut as the main agricultural crop in Siargao covers 81% equivalent to 32,229 hectares of the total agricultural area (Figure 18). Meanwhile, annual crops such as palay, corn, rootcrops, and other cash crops account only for just 19% equivalent to 7,647 hectares of the total agricultural land. Palay is grown on 10% which is about 4,128 hectares of the total agricultural production area.



Figure 18. Coconut plantation as SIPLAS main agricultural crop.

Terrestrial/Freshwater Floral Species within SIPLAS

Siargao Islands is home to *mancono* (iron wood), *payuspos* (an endemic species in the island) and some dipterocarps such as white *lauan* and *yakal*. The Ecotown Project in 2012 conducted an inventory of the floral species in the island using established transect plots. The documentation of the said project suggested that Siargao has a relatively high proportion (46.3%) of endemic flora. These endemic floral species include the species of *anislag*, *ipil*, *mancono*, agoho pine and sudjang (CPPAP Resource Inventory, CY 1998).

During a rapid field assessment of the watershed area of the Del Carmen Water District in September 12, 2013, additional primary data on plant diversity of this area were documented. This quick survey yielded a total of one hundred twelve (112) taxa consisting of one hundred ten (110) flowering plants (Angiosperm), one (1) Gymnosperm species and one (1) mushroom species. The results of the survey also documented endemic floral species to the Philippines such as the white *lauan* (*Shorea contorta*, Dipterocarpaceae), Philippine oak (*Quercus philippinensis*, Fagaceae), *tubli* (*Derris philippinensis*, Papilionaceae), *alopaying gubat* (*Homalomena philippinensis*, Araceae), *panaon* (*Alpinia elegans*, Zingiberaceae), *tagbak* (*Alpinia philippinensis*, Zingiberaceae), climbing *pandan* (*Freycinetia negrosensis*, Pandanaceae), and *niogniogan* (*Ficus pseudopalma*, Moraceae).

In CY 2018, Biodiversity Assessment and Monitoring systems was conducted in Sitio Lobo, Brgy. 12, Dapa, SDN and documented 36 floral species belonging to twenty-six (26) families. Out of the documented thirty-six (36) species, thirty-three (33) species are endemic while the other three species are non-endemic. Notable threatened floral species present in SIPLAS include the pitcher plant (*Nepenthes surigaoensis*), *Medinilla astronioides*, as well as the recently published *Begonia benitotanii* a new endemic species recorded in Bucas Grande. Table 16 presents the list of important floral species within SIPLAS and their conservation status.

In terms of their conservation status, there are five (5) species that are classified as “other threatened species”, five (5) “vulnerable” species, three (3) “endangered” species, and two (2) critically endangered species. The critically endangered species are the *Asplenium*

affine and the *Shorea astylosa* commonly known as yakal which are reported endemic in the Philippines.

Table 16. Conservation status of flora species in SIPLAS

Scientific Name	Family	Endemism	Conservation Status (DAO 2017-11)
<i>Afzelia rhomboidea</i>	Fabaceae	Non-Endemic	Endangered
<i>Asplenium affine</i>	Asplenicaceae	Endemic	Critically Endangered
<i>Begonia benitotanii</i>	Begoniaceae	Endemic	* Critically Endangered
<i>Dipterocarpus grandiflorus</i>	Dipterocarpaceae	Non-Endemic	Vulnerable
<i>Gloeocarpus patentivalvis</i>	Sapindaceae	Endemic	Endangered
<i>Nepenthes surigaoensis</i>	Nepenthaceae	Endemic	Endangered
<i>Medinilla astronioides</i>	Melastomataceae	Endemic	Vulnerable
<i>Sararanga philippinensis</i>	Pandanaceae	Endemic	Vulnerable
<i>Shorea astylosa</i>	Dipterocarpaceae	Endemic	Critically Endangered
<i>Shorea contorta</i>	Dipterocarpaceae	Endemic	Vulnerable
<i>Shorea negrosensis</i>	Dipterocarpaceae	Endemic	Vulnerable
<i>Vitex parviflora</i>	Lamiaceae	Endemic	Endangered

Source: Comprehensive Report on Biodiversity Monitoring Systems (BAMS) in SIPLAS, 2018

* *Begonia benitotanii* (section *Petermannia*, Begoniaceae) a new species endemic to the Philippines, Island of Bucas Grande

Terrestrial/Freshwater Faunal Species within SIPLAS

The Siargao Islands assessment and inventory reported to have high fauna endemism. There are eighty-five (85) birds with an endemism of 65%, nine (9) amphibian species with an endemism of 33%, and twenty-one (21) mammal species with an endemism of 67% in the islands (CPPAP Resource Inventory, 1998). The Philippine Cockatoo, Dinagat gymnure and golden crown flying fox are a few of the important bird species found in SIPLAS. The endangered tarsier (*Tarsius syrichta*) can also be found in SIPLAS. Meanwhile, the Rufous and tarictic hornbills, oriole, *sewit*, *tiko*, and *takray* are just some species of birds which can be found in the forest.

Various birds, amphibians, reptiles, and mammals (volant and non-volant) were reported during a faunal survey conducted in three locations in SIPLAS (Jaboy, Pilar; Lagoon Tiktikan, Barangays Sudlon and Barangay San Roque, Socorro and Del Carmen). In this particular survey, two species endemic to the island were recorded, namely: *Pseudogeckko siargao* (lizard) and *Platymantis siargao* (frog).

Table 17 presents the important faunal species in SIPLAS and their conservation status. There are ten (10) important faunal species within SIPLAS with the following conservation status: lower risk, near threatened, vulnerable, endangered and critical. Two (2) species have “vulnerable” conservation status. These are the *Pteropus pumilus* (Little golden-mantled flying fox) and the *Urogale everetti* (Mindanao tree shrew). Two (2) species are considered “endangered”. These are the *Podogymnura aureospinula* (Dinagat gymnure) and the *Acerodon jubatus* (Golden-crowned flying fox). The *Cacatua haematuropygia* or the Philippine cockatoo is already considered critical in terms of its conservation status.

Per SIPLAS PAMO BAMS CY 2018, the following were observed:

- a. There were 45 species of birds observed in Lobo, Brgy, 12, Dapa, SDN. Most of them are heard/seen in the forest. Out of 45 species, 24% are Philippine endemics. On the other hand, they were not in the list of threatened species under DAO 2004-15 and CITES. However, in the IUCN Red List categories, 4% are categorized as vulnerable (VU) species;
- b. A total of eight (8) species of mammals belonging to two (2) orders and five (5) families were recorded in the forest of Lobo, Brgy, 12, Dapa, SDN. Fifty percent (50%) of which were volant mammals (i.e., bats), the other half were non-volant mammals. On the other hand, among the mammals recorded from the study site, 50% of which are Philippine endemics. Similarly, with regards to mammal population status, 12% were vulnerable (VU) species and 13% are near-threatened (NT) under IUCN Red List Category of Threatened Species;
- c. For Herpetofauna a total of 35 species of herpetofauna were recorded, i.e., 20 reptiles and 15 amphibians. Out of 20 reptilian species, 30% are Philippine endemics and 30% are categorized as threatened species under IUCN Red List. Similarly, of the 15 amphibian species, 20% are Philippine endemics and 40% are threatened species listed in the IUCN Red List.
- d. There were 37 species of terrestrial arthropods belonging to 2 classes, 10 orders, and 25 families were recorded at the BAMS site located at Lobo, Catabaan, Dapa, Surigao del Norte.

List of fauna recorded during the SIPLAS PAMO BAMS CY 2018 is attached in Annex 8, while the location of BAMS site is shown in Figure 19.

Table 17. Important Fauna Species in SIPLAS and their Conservation Status

Species	Common Name/ Local Name	DAO 2019 -09 Conservation Status
<i>Acerodon jubatus</i>	Golden-crowned flying fox	Critically Endangered
<i>Anas luzonica</i>	Philippine Mallard	Near-threatened
<i>Buceros hydrocorax mindanensis</i>	Rufous Hornbill	Near-threatened
<i>Cacatua haematuropygia</i>	Philippine cockatoo	Critically Endangered
<i>Crocodylus porosus</i>	Estuarine Crocodile	Lower Risk
<i>Megapodius cumingii</i>	Philippine Scrubfowl	Near-threatened
<i>Penelopides affinis</i>	Tarictic Hornbill	Endangered
<i>Podogymnura aureospinula</i>	Dinagat gymnure	Endangered
<i>Pteropus pumilus</i>	Little golden-mantled flying fox	Vulnerable
<i>Tarsius syrichta</i> *	Philippine Tarsier	Other-Threatened Species
<i>Urogale everetti</i>	Mindanao tree shrew	Vulnerable

Source: BAMS Report CY 2018

*Population Survey and Monitoring of Philippine Tarsier CY 2015 and CY 2021

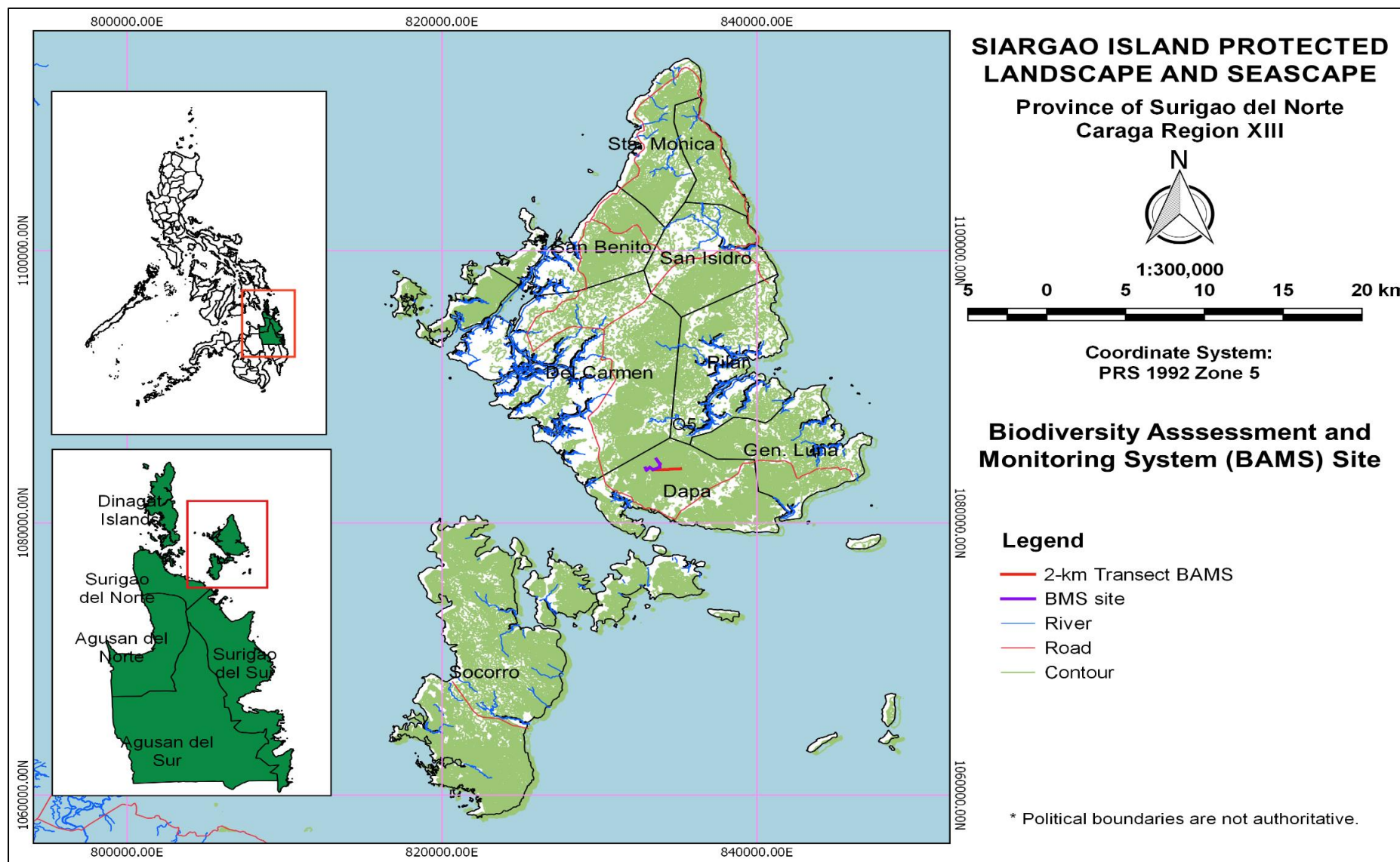


Figure 19. Location map of the BAMS site in Dapa, Siargao Island, SDN

b. Coastal and Marine Biological Resources

The biodiversity of the coastal and marine ecosystems within SIPLAS is also notable. Ten (10) species of seagrasses, which is half of all species recorded in the Philippines and the Southeast Asian Region, can be found in SIPLAS. These seagrass species are the following: *Cymodocea rotundata*, *Cymodocea serrulata*, *Syringodium isoetifolium*, *Enhalus acoroides*, *Halophila ovalis*, *Halophila decipiens*, *Halophila minor*, *Halodule pinifolia*, *Halodule uninervis*, and *Thalassia hemprichii*. There are also fifty-nine (59) species of seaweeds representing 37% of the total number of benthic seaweeds reported in the Philippines. The marine fauna is composed of some 238 species of fish (recorded from a single reef), 38 genera of corals and 137 species of mollusks. Sharks (*Rhincodon typus*); Dugongs (*Dugong dugon*); Hawksbill Turtle (*Eretmochelys imbricata*); Green Sea Turtle (*Chelonia mydas*), Olive Ridley Turtle (*Lepidochelys olivacea*), Leatherback Sea Turtle (*Dermochelys coriacea*), and Loggerhead Sea Turtle (*Caretta caretta*) and Saltwater Crocodile (*Crocodylus porosus*) are some of the important rare and endangered marine animals in the area. The Saltwater Crocodile inhabits the SIPLAS mangroves as well. The following are the coastal and marine habitats found in SIPLAS:

Coastal/Marine Habitats

1.) Mangroves.

Rhizophora (*Rhizophora apiculata*) dominates the expansive mangrove stands in SIPLAS. An ecotone with mixed species of beach forests and other mangrove associates bordered the mangrove area. The mangrove cover in SIPLAS had increased from CY 2011 to CY 2020, according to historical records. The total mangrove forest cover in CY 2011 is 7,768.60 hectares and it increases to 9,370.125 in CY 2020 as shown in Table 18. The municipality of Del Carmen has one of the largest mangrove forest cover in the Philippines with 4,478 hectares (48% of the total cover) followed by the municipality of San Benito with 1,479 hectares (16% of the total cover) and the municipality of Pilar with 1,406 hectares (15% of the total cover). Figure 20 shows the drone shot of SIPLAS mangrove forests. In addition, the recent mangrove assessment in CY 2020 revealed that SIPLAS mangrove cover is in excellent as shown in Table 19 and 20. There are twenty-five (25) mangrove species recorded during the CY 2020 mangrove assessment as presented in Table 21. The geographical map of mangrove forest in SIPLAS is presented in Figure 21.



Figure 20. Mangrove forest in SIPLAS

Table 18. Mangrove Forest cover by Municipality

Municipality	Mangrove cover (hectares)				
	1988*	2003^	2011**	2015***	2020^*
Dapa	619.1	517.3	698.9	698.9	774
Del Carmen	5,547.60	4,406.80	4,295.00	4,327.77	4,478.00
Socorro	no data	239.7	195.2	195.2	492
San Benito	1,421.10	1,191.70	1,009.80	1,009.80	1,479.00
Pilar	1,786.20	1,563.30	1,216.80	1,216.80	1,406.00
San Isidro	no data	161.2	160.4	160.4	27
Sta. Monica	no data	92.8	81.1	81.1	74
Gen. Luna	405.3	239	111.4	111.4	640
Burgos	n/a	n/a	n/a	0.25	0.125
Total	9,779.30	8,411.80	7,768.60	7,801.62	9,370.13
Average Annual % Increase/Decrease		-13.98%	-20.56%	-20.22%	-4.39%

Note: n/a (not applicable).

Source: * -DENR Land Cover Map (based on 1988 spot satellite image)

^EcoGov Project 2004 based on 2003 satellite imagery; and

**EcoTown Project 2011

***CoRVA 2017

^*DENR SIPLAS PAMO

Table 19. Computed mangrove species diversity indices in SIPLAS

Municipality	Number of Species	Number of Individuals	Simpson's Index (D)	Shannon-Weiner Index (H')	Evenness Index (e)
Burgos	3	8	0.32	1.1	0.89
Dapa	16	2978	0.22	2.77	0.7
Del Carmen	21	21146	0.4	3.09	0.43
General Luna	21	913	0.21	3.05	0.68
Pilar	13	7109	0.46	2.57	0.47
San Benito	10	6418	0.39	2.3	0.6
San Isidro	10	65	0.24	2.3	0.77
Socorro	12	828	0.26	2.49	0.72
Sta. Monica	10	262	0.31	2.3	0.66
OVERALL	25	39,727	0.31	2.44	0.66

Source: SIPLAS-PAMO CY 2020

Table 20. Mangrove habitat condition in nine (9) municipalities in SIPLAS

Municipality	% Crown Cover	Condition *
Burgos	96.73	excellent
Dapa	87.56	excellent
Del Carmen	86.41	excellent
General Luna	90.95	excellent
Pilar	87.39	excellent
San Benito	88.72	excellent
San Isidro	86.46	excellent
Socorro	88.37	excellent
Sta. Monica	91.17	excellent

Source: SIPLAS-PAMO Mangrove Assessment Report CY 2020

Table 21. List of Mangrove species in SIPLAS

Family	Species	Local Name
Myrsinaceae	<i>Aegiceras corniculatum</i>	Saging-saging
Avicenniaceae	<i>Avicennia alba</i>	Miapi
	<i>Avicennia marina</i>	Bayabason
	<i>Avicennia officinalis</i>	Api-api
	<i>Avicennia rumphiana</i>	Bungalon
Tiliaceae	<i>Brownlowia tersa</i>	Maragomon
Rhizophoraceae	<i>Bruguiera cylindrica</i>	Busain
	<i>Bruguiera gymnorrhiza</i>	Pototan
	<i>Bruguiera parviflora</i>	Langarai
	<i>Bruguiera sexangula</i>	Karakandang
	<i>Ceriops tagal</i>	Tungog
	<i>Ceriops zippeliana</i>	Baras-baras
	<i>Rhizophora apiculata</i>	Bakhaw lalaki
	<i>Rhizophora mucronata</i>	Bakhaw babae
	<i>Rhizophora stylosa</i>	Bakhaw bato
Sterculiaceae	<i>Heritiera littoralis</i>	Dungonlate
Combretaceae	<i>Lumnitzera littorea</i>	Tabao
	<i>Lumnitzera racemosa</i>	Culasi
Arecaceae	<i>Nypa fruticans</i>	Nipa
Lythraceae	<i>Pemphis acidula</i>	Bantigi
Rubiaceae	<i>Scyphiphora hydrophyllacea</i>	Nilad
Sonneratiaceae	<i>Sonneratia alba</i>	Pagatpat
	<i>Sonneratia ovata</i>	Pedada
Meliaceae	<i>Xylocarpus granatum</i>	Tabigi
	<i>Xylocarpus moluccensis</i>	Piag-ao

Source: SIPLAS-PAMO Mangrove Assessment CY 2020

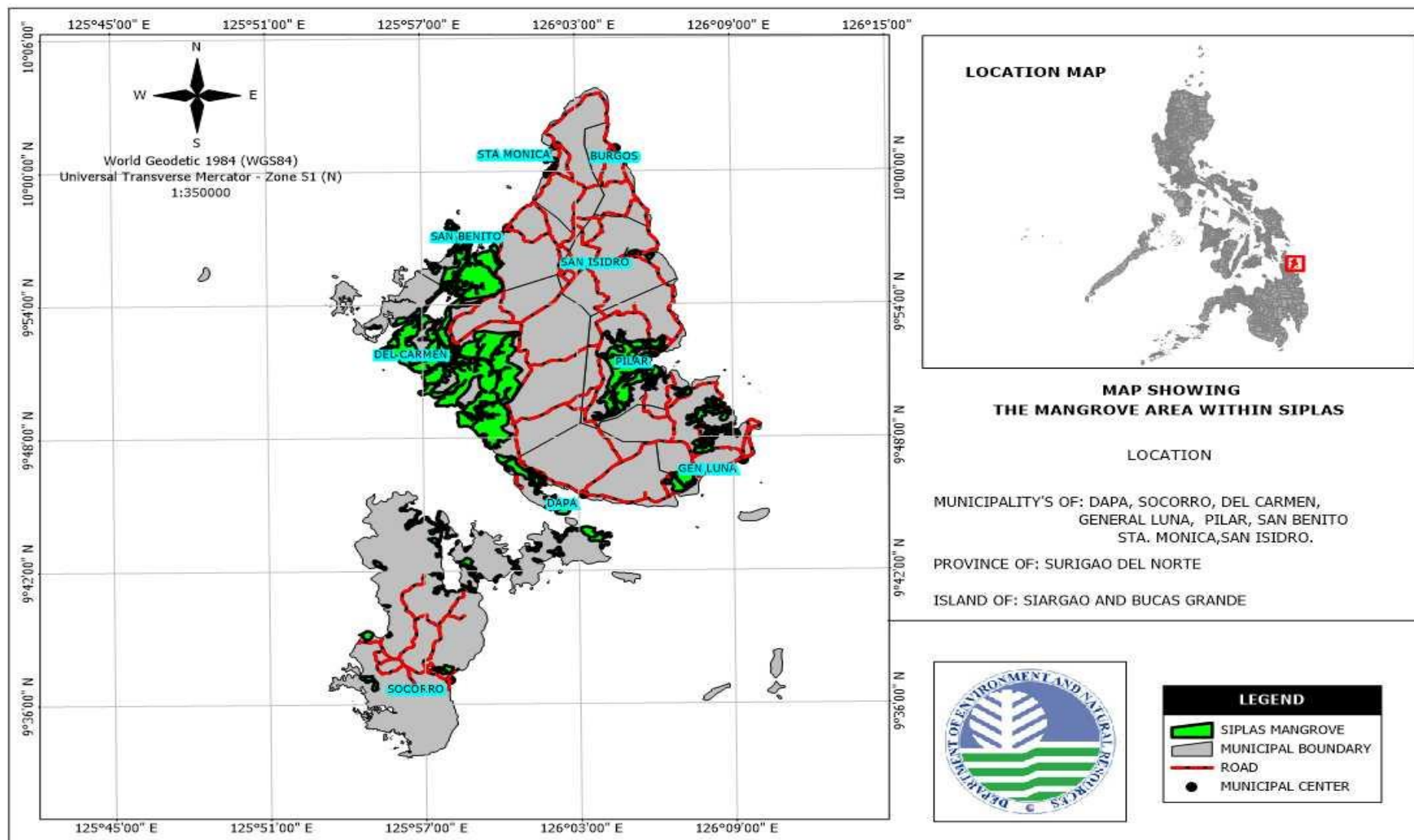


Figure 21. Geographical map showing the Mangrove area in nine (9) municipalities in SIPLAS for CY 2019.

Source: SIPLAS-PAMO Mangrove Assessment CY 2019

2.) Seagrasses

Siargao Islands were put at the bottom margin of the moderate level of species richness category in an analysis of species richness of the seagrass population along the Pacific coast. There are about six (6) to eight (8) species according to Licuanan et al. (CY 2011). Seagrass assessment was conducted by SIPLAS PAMO (CY 2017-2021) and documented ten (10) seagrass species. Extensive cover of seagrass beds can still be found in Del Carmen, San Benito, Pilar and General Luna. Marine fauna uses these beds of seagrasses as a haven and refuge. Dugongs and marine turtles are just two (2) of the large vertebrate animals that live or visit in this habitat. Table 22 provide the seagrass composition in SIPLAS while Table 23 provide seagrass cover status per municipality. The seagrass condition in SIPLAS is presented in Figure 23.

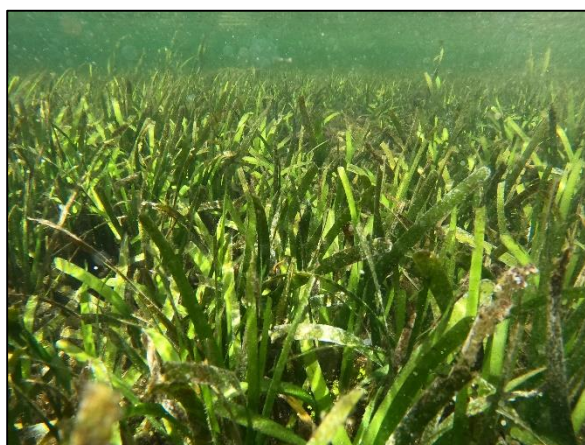


Figure 22. Seagrass beds in Brgy. Union, Dapa, Surigao del Norte

Table 22. Seagrass composition in SIPLAS

Family	Scientific Name	Common Name
Cymodoceacea	<i>Cymodocea rotundata</i>	Smooth Ribbon seagrass
	<i>Cymodocea serrulata</i>	Serrated Ribbon seagrass
	<i>Halodule pinifolia</i>	Needle Seagrass
	<i>Halodule uninervis</i>	Needle/Narrow Leaf Seagrass
	<i>Syringodium isoetifolium</i>	Noodle Seagrass
Hydrocharitaceae	<i>Enhalus acoroides</i>	Tape Seagrass
	<i>Thalassia hemprichii</i>	Sickle Seagrass
	<i>Halophila minor</i>	Seagrass
	<i>Halophila decipiens</i>	Paddle Grass Caribbean Seagrass
	<i>Halophila ovalis</i>	Spoon Seagrass

Source: SIPLAS PAMO Seagrass Assessment Report CY 2021.

Table 23. Seagrass percent cover by municipality

Municipality	Seagrass percent (%) cover		
	2017*	2019*	2020*
Burgos	52	48	32.87
Dapa	33	27.35	36.1
Del Carmen	26	33.2	27.22
General Luna	39	48.37	44.84
Pilar	46	26	26
San Benito	48	38	33.72
San Isidro	37	32	15.68
Sta. Monica	52	50	40.9
Socorro	33	39	43.65
Average	40.67	37.99	33.44

Source: *DENR SIPLAS Seagrass Assessment Report, CY 2020.

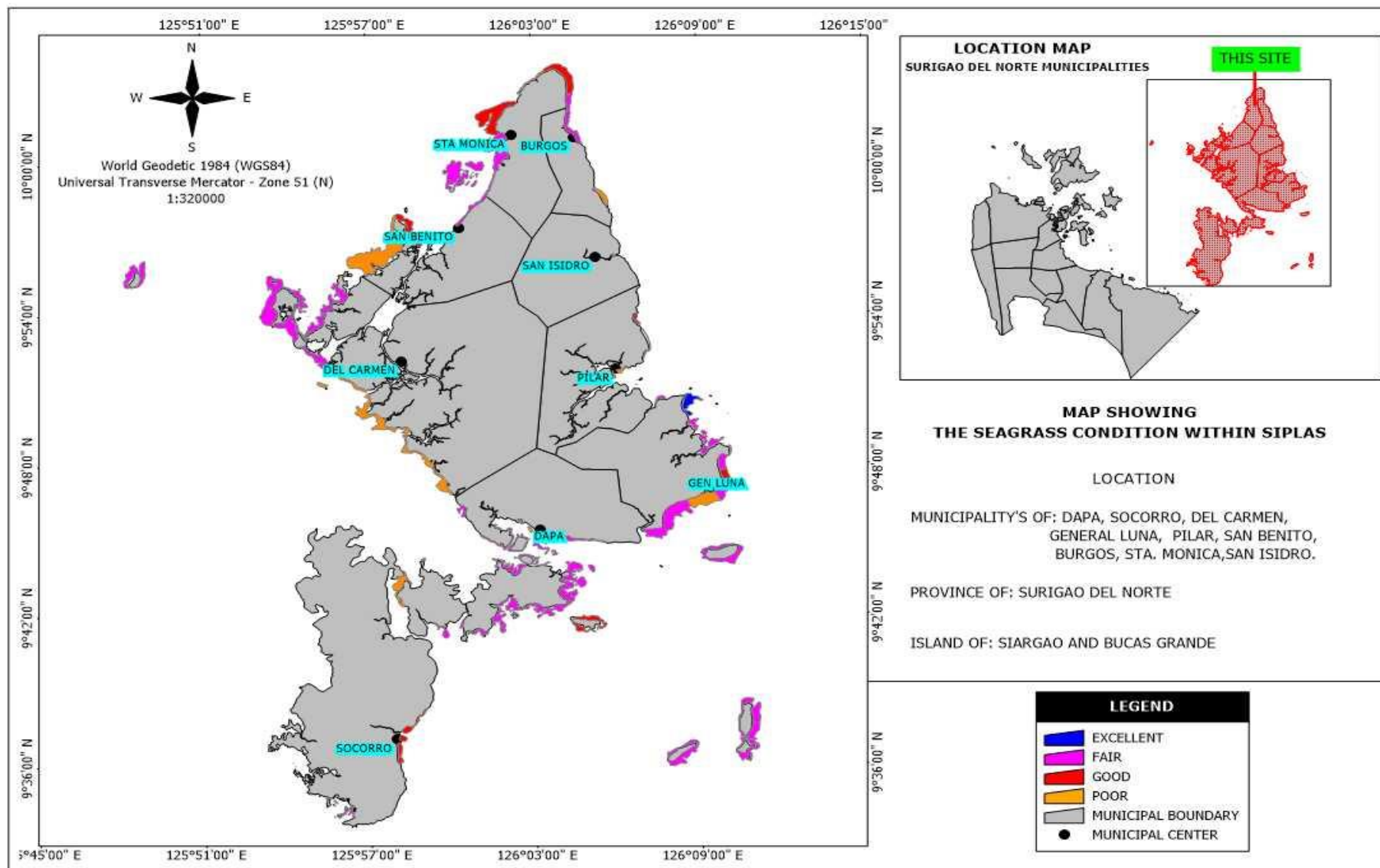


Figure 23. Geographical map showing the seagrass condition of the nine (9) municipalities in SIPLAS CY 2020

3.) Coral Reefs

SIPLAS is home to about thirty-eight (38) coral genera, according to historical data from CY 1991. The estimated coral cover varied from poor to good at the time. Sta. Monica and Del Carmen had the highest total percentage coral cover in CY 2012, according to available data (Ecotown Project CY 2012). Although there seemed to be more coral cover, the overall quality has deteriorated. Algal cover on coral reefs was also found to be relatively high, ranging from 40% to 70%. Figure 24 shows the coral reef condition in General Luna Marine Sanctuary.



Figure 24. General Luna Marine Sanctuary

Recent assessment of coral cover by municipalities showed an increase average percentage as depicted in both Table 24 and 25, respectively. Despite the slow increase, its coral condition remains fair as presented in Table 26. The mapped coral cover in SIPLAS is presented in Figure 25.

Table 24. Coral percent cover by municipality

Municipality	Coral percent (%) cover			
	2017*	2018*	2019*	2020*
Burgos	31.85	29.45	27.2	26.98
Dapa	18.33	15.3	29.9	30.07
Del Carmen	30.37	23.9	11.7	11.98
General Luna	29.63	25.32	21.28	27.48
Pilar	31.85	27.45	24.9	31.33
San Benito	23.33	39.62	24.88	23.34
San Isidro	20.74	4.28	1.66	6.12
Sta. Monica	36.67	31.54	46.3	46.5
Socorro	20.74	23.42	25.33	32.03
Average	27.06	24.48	23.68	26.2

Source: * DENR SIPLAS CMEMP Coral Reef Monitoring CY 2017, 2018, 2019 and 2020.

Table 25. Coral cover from CY 2017-2020 with corresponding condition.

Year	Coral % Cover	Condition
2017	31.85	Fair
2018	18.33	Fair
2019	30.37	Fair
2020	29.63	Fair

Source: SIPLAS-PAMO, CY 2020

Table 26. Coral cover condition by municipality

Municipality	Total Area (hectares)	Coral percent (%) cover		
		2017	2019	2020
Burgos	113	Good	Fair	Fair
Dapa	1040	Fair	Fair	Fair
Del Carmen	1189	Fair	Fair	Fair
General Luna	1332	Fair	Fair	Fair
Pilar	46	Fair	Fair	Fair
San Benito	910	Fair	Fair	Fair
San Isidro	3	Fair	Fair	Poor
Sta. Monica	641	Good	Fair	Fair
Socorro	120	Fair	Fair	Fair
OVERALL	5393	Fair	Fair	Fair

Source: SIPLAS-PAMO CY 2017-2020

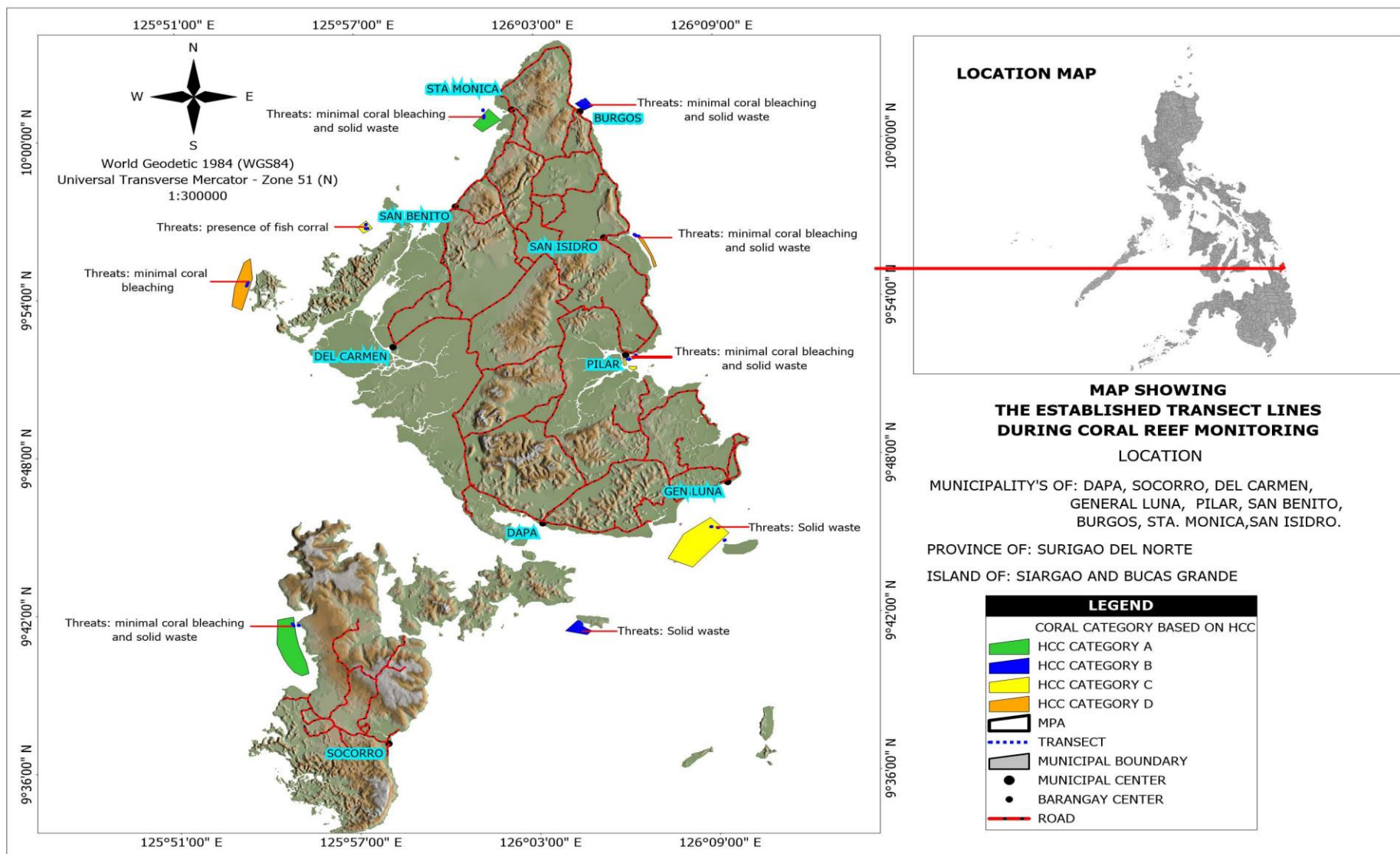


Figure 25. Geographical map showing the coral cover of the nine (9) municipalities in SIPLAS CY 2020

4.) Artificial Reefs in SIPLAS

One of the initiative strategies in coral rehabilitation program in SIPLAS is the installation of the artificial reefs (ARs) to the selected marine sanctuaries. The installation of the artificial reefs was done under the Sustainable Coral Reef Ecosystem Program (SCREMP) of DENR's national program (CY 2012-2020), a program focused on strategic, sustainable, and ecosystem-based approach in protecting and rehabilitating coral reef ecosystems within the country.



Figure 26. Installed AR at Corregidor MPA per CY 2020 coral reef monitoring

In 2013, SIPLAS is included as one of the pilot sites in installation of AR's with a total of 2,000 artificial reefs deployed and installed to the selected marine sanctuaries as presented in Table 27. The artificial reef structures are man-made structures typically built to provide artificial shelter for marine organisms, as well as, to provide hard surfaces for attachment for benthic organisms such as coral polyp as shown in Figure 26.

The sustainable management of coral reef ecosystem had successfully implemented in partnership with the nine Local Government Units, research and academic institutions, NGAs, NGOs and organized and registered People's Organizations.

Table 27. Artificial Reefs installed in the selected marine sanctuaries in SIPLAS

Municipality	Name of Marine Sanctuary/Location	No. of Artificial Reefs deployed and installed
Burgos	Lakyaon Marine Sanctuary, Pob. 1 and 2	200
Dapa	Corregidor Marine Sanctuary, Brgy. Corregidor	200
Del Carmen	Caub Marine Sanctuary, Brgy. Caub	200
General Luna	General Luna Marine Sanctuary, Pob. 1, Daku	200
Pilar	Pilar Marine Sanctuary, Brgy. Centro, Punta, Asinan and Pilaring	400
San Benito	Maribojoc Marine Sanctuary, Brgy. Maribojoc	200
San Isidro	Tigasao Marine Sannctuary, Brgy. Tigasao	200
Socorro	Pamosaingan Marine Sanctuary, Brgy. Pamosaingan	200
Sta. Monica	T-Arlan Marine Sanctuary, Brgy. T-Arlan	200
TOTAL		2,000

Source: SIPLAS PAMO, Sustainable Coral Reef Ecosystem Program Annual Report CY 2014.

Coastal/Marine Faunal Species within SIPLAS

SIPLAS has a rich coastal and marine ecosystem biodiversity wherein several important marine species found. The hawksbill turtle (*Erythemochelys imbricata*), Green sea turtle (*Chelonia mydas*), and Olive Ridley sea turtle (*Lepidochelys olivacea*) are endangered marine fauna species that found their home in the SIPLAS coastal and marine areas. Marine crocodiles also thrive in the area because of the vastness of the mangrove cover and its pristine ecological condition. The island's mangrove forest is home to one of the country's largest extant salt water crocodile, *Crocodylus porosus* (locally known as *kibol*). Dolphins and the threatened dugong are also a few of the important marine species that were documented in the area.

Significant coral species observed include a community rare fox coral (*Nemenezophyllia turbida*) was found in Bucas Grande Island and is recognized as an important Evolutionary Distinct Globally Endangered (EDGE) species. Figure 27 shows the location map of the EDGE species.

A total of 238 species of reef fishes were recorded by UP Marine Science Institute CoRVA Project on CY 2014. The CY 2012 data show a total of 214 species or a projected species richness of 238 (*Ecotown Project, CY 2012*). However, this does not mean that species richness increased through time. Varying data presented are dependent on the number of transect surveyed. It should be noted that the Philippines has the highest diversity of butterfly fishes (Chaetodontidae) per unit area (Nanola, 2012). Based on the accumulated number of transects surveyed in Surigao Provinces since 2001 (Licuanan et al., CY 2011; Nanola et al., CY 2011), a total of 31 species of butterfly fishes have been recorded. This represents 67% of the total number of butterfly fishes recorded for the country (Nanola, CY 2012).

Using cluster analysis of benthic cover and reef fish information, Siargao Island can be divided into three clusters, namely: the northwest cluster (east of Del Carmen, San Benito, Sta. Monica); northeast cluster (Burgos, San Isidro, Pilar, General Luna); and southern cluster (Dapa, Socorro, south of Del Carmen) clusters. Based on this classification, northwest and northeast clusters have better total fish (~11 mt/km²) and herbivore (3 to 4mt/km²) biomass composition compared to the southern cluster which only has around 4 mt/km² and less than 2 mt/km² of total fish and herbivore fish biomass composition, respectively as shown in Table 28. The information on percentage coral cover cannot be compared because of the absence of coral data for the southern cluster. For CY 2020 SIPLAS PAMO Fish Visual Census (FVC) was conducted and same data from CY 2012 Ecotown Project were recorded.

To note, herbivorous reef fishes promote reef resilience by trimming down algal biomass. Current trends indicate that at least 10 mt/km² of herbivores are needed for a reef to be resilient. Herbivore biomass of around 5 mt/km², reefs can still be resilient if the herbivore biomass is fully protected.

Annex 11 provided a list of reef fishes and corresponding fish family.

Table 28. Summary of marine biological parameters for different Clusters in SIPLAS

Biological Parameters	Cluster		
	Northwest	Northeast	Southern
Reef fish species richness (jackknife estimates)	^*161 (n=10)	^170 (n=6) *170 (n=12)	^*138 (n=6)
Total fish estimated biomass (mt/km2)	^*11.09±1.81	^*11.15±1.65	^*4.02±1.17
Herbivore fish estimated biomass (mt/km2)	^*3.43±0.93	^*4.08±0.80	^*2.18±0.74

Legend: n = number of transects surveyed,

nd = no data;

^Ecotown Project 2012 as cited in SIPLAS Management Plan 2015;

*CY 2020 SIPLAS PAMO Fish Visual Census

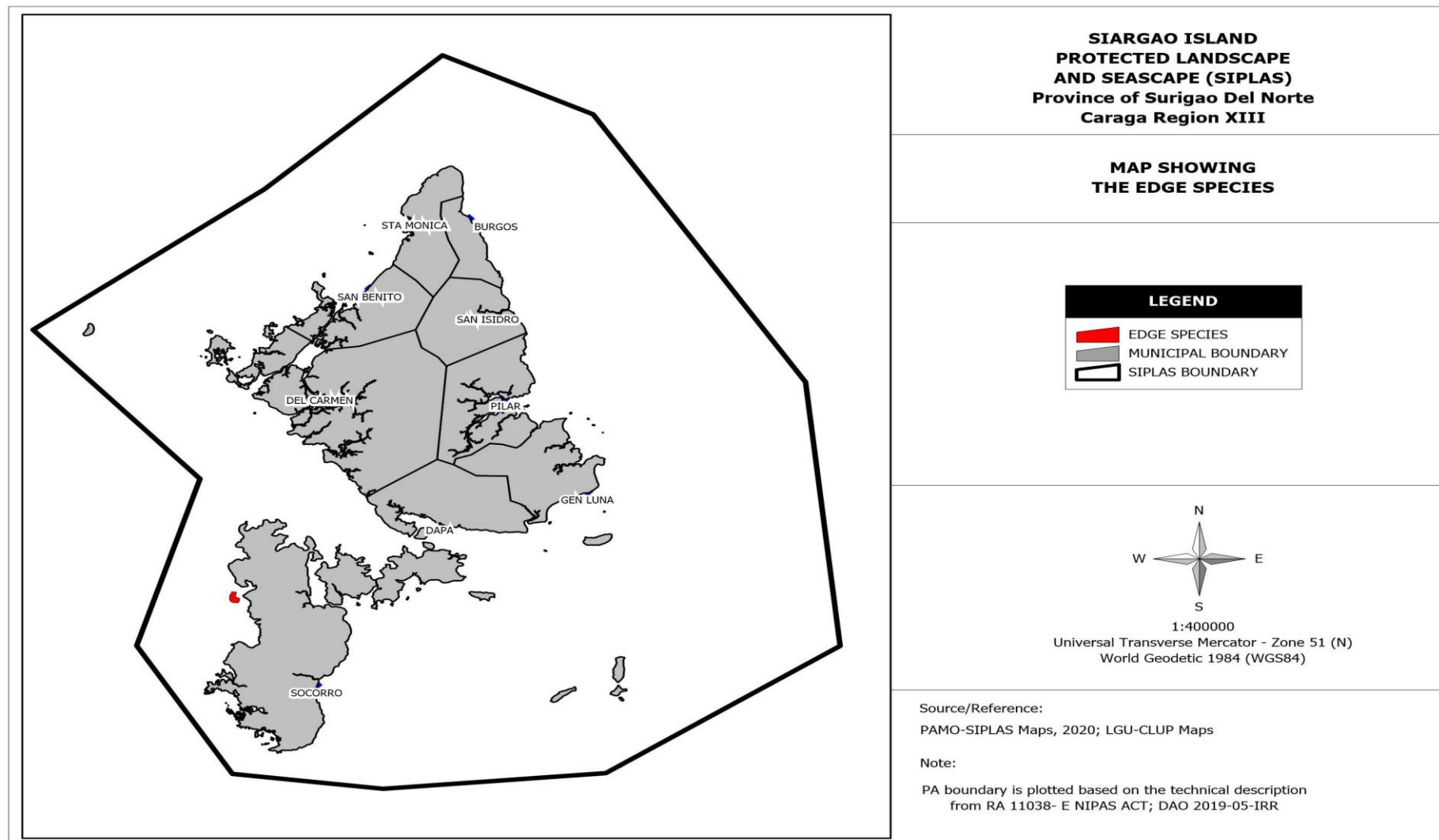


Figure 27. Location of Evolutionary Distinct Globally Endangered (EDGE) Species in Barangay Pamosaingan, Socorro, SDN within SIPLAS.

Source: SIPLAS PAMO, CY 2020

2.2 Socio-Cultural and Economic Profile in SIPLAS

2.2.1 Regional, Provincial and Island-wide Economic Development Setting

The development plans and programs of individual LGUs in the Province of Surigao del Norte and the numerous development partners that represent Caraga Region have a direct effect on economic activities in SIPLAS. Given its potential to be the country's timber corridor and eco-tourism hub, the Mindanao Development Framework Plan designated Caraga Region as one of Mindanao's seven Area Development Zones (ADZs) in 2000. The Caraga Regional Physical Framework Plan for 2004 to 2030, which specifically aims to develop the region into an agri-fishery, mineral, and eco-tourism hub, translates this into reality.

In 2006, the Caraga Region's tourism push was reaffirmed. Cross-regional zones with specific objectives and strategic directions were established by the national government. Despite being part of Surigao del Norte, the Siargao Islands were included in the Central Philippines Tourism Super Region, which also included the Bicol Region (Region V), Western Visayas (Region VI), Central Visayas (Region VII), Eastern Visayas (Region VIII), and the provinces of Palawan and Romblon. This approach laid the foundation for the Siargao Islands' tourism growth to pick up pace. Since then, municipal LGUs, the Province, and concerned government line agencies have proposed a variety of tourism initiatives, and projects on tourism-related facilities and infrastructures are in the works.

Major tourist locations in SIPLAS have been listed as priority development areas by the Provincial LGU. The 27-kilometer stretch of white sand beaches in General Luna and other areas of the Siargao Islands, cascading waterfalls, unusual rock formations, enchanting caves, extensive mangrove forests, marine parks, and massive waves for surfing are just a few examples. The province also wants to continue agro-fishery production in order to improve its tourism potential.

With the aid of the Provincial LGU and NEDA Regional XIII, the Siargao Islands Area Development Plan (SIADP) for CY 2011 to 2016 was established. This is aimed at making the area a "world-class tourism destination" that "offers the best experience with its diverse attractions and adventures while maintaining environmental integrity through strong stakeholder cooperation."

Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 highlighted that tourism holds a dynamic means of improving the economy of Surigao del Norte. Tourism destinations include cultural, historical and religious sites, and man-made structures, facilities and places of interests such as the famous Cloud 9 in General Luna recognized as one of the international surfing sites in the Philippines.

Based on their CLUPs and other development plans, Table 29 displays the development thrusts of each municipality within SIPLAS.

Table 29. Development Thrusts of every municipality in SIPLAS

Municipality	Development Thrusts
Burgos	Marine Protected Area (MPA) management, agro-forestry and crop development, forest and watershed management, fishery, ecotourism
Dapa	Agro-forestry, watershed, MPA/fish sanctuary management, urban management, Agri-tourism
Del Carmen	Forestry/watershed management, mangrove/ aquasilviculture, eco-tourism, agri-industry production, fishery production, MPA management.
General Luna	Agricultural development (coconut and rice production), forest and watershed management, Marine sanctuary/fishery development, mangrove protection, coral reef protection, tourism
Pilar	Agriculture development (coconut and rice production), Agri-tourism, Ecotourism, marine sanctuary and mangrove protection and management, agri-fishery, urban settlement management, MPA management.
San Benito	Agri-fishery production, marine sanctuary management, mangrove management, reef and seagrass management, ecotourism, development of infrastructure facilities, urban and housing development
San Isidro	Forest and watershed management, agri-industry production, mangrove protection and management, agro-forestry, agri-fishery, ecotourism, urban settlement management
Santa Monica (Sapao)	Agri-production (rice and corn), forest and watershed management, mangrove, MPA management, Ecotourism
Socorro	Mangrove protection and management, tourism, agri production, agro-forestry, watershed and water sources protection and management, agri-tourism, forest protection, agro-industrial development, MPA management, fishery development

Source: Municipal Profiles and CLUPs

2.2.2 SIPLAS Demography and Social Profile

Income status, population and population growth rate

Surigao del Norte ranked second in terms of the incidence of poverty among the four provinces of the Caraga Region. It was estimated in 2012 that 34.6% of the province's households were considered poor. The Siargao Islands are home to nine of the top twenty poorest barangays in Surigao del Norte Province. The average household income per month in the Siargao Islands varied from Php 4,947 to Php 21,267 on the basis of the Natural Resource Assessment (NRA) household survey report. The highest average monthly household income was in San Isidro, while the lowest average monthly household income was in Burgos. SIPLAS municipalities belong to the fourth to sixth income classes.

In CY 2020, the total population in SIPLAS was 136,092 or 25,262 households. The population of the nine (9) LGUs accounts for about 25% of the province total population. The most populated municipality in SIPLAS are Dapa that covers 21.3% of the population followed by Socorro which covers 19%, and General Luna covers 16.8%. These three (3) municipalities are the island's main commercial and trade hubs.

The population of the Siargao Islands has been steadily growing since CY 2000, according to historical data. The fast growing municipalities are General Luna with 4.29% average annual growth rate followed by Dapa with 2.13% and San Isidro with 2.02%. These growth rates are substantially higher than the Caraga region average growth rate which is 1.63%. Surigaonons make up the majority of the population in SIPLAS other are Cebuanos, Leyteños, Samareños, Hiligaynons, and Tagalogs.

Table 30, Table 31 and Table 32 presents the data on poverty incidence, income class of population and estimated number of households, and the historical growth of populations in SIPLAS, respectively.

Meanwhile, Table 33 and Table 34 present the number of firms, investment and generated employment in manufacturing and production and in service and trading, respectively.

Table 30. Poverty Incidence in SIPLAS

MUNICIPALITY	POVERTY INCIDENCE		
	2006	2009	2012
SIARGAO ISLAND			
Burgos	46.9	53.2	40.4
Dapa	44	52.2	43.5
Del Carmen	40.7	58.9	41.2
Gen. Luna	50.6	55.4	44.5
Pilar	54.4	62.8	46.4
San Benito	48.2	62.6	42.4
San Isidro	49.6	51.7	46.2
Santa Monica	45.4	52.4	36.1
Socorro	54	52.1	58.7

Source: Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 (Surigao del Norte)

Table 31. Income Class, Population and Estimated No. of Households: 2015 and 2020

Municipality	Income Class	2015 Population	2020 population	Estimated No. of HHs	Relative Proportion to Total Population of Siargao Island (%)
SIARGAO ISLAND		116,587	136, 092	25,262	
Burgos	6th	4,034	4,185	910	3.1
Dapa	4th	23,787	29,006	5,129	21.3
Del Carmen	5th	18,392	20,127	3,892	14.8
Gen. Luna	5th	16,771	22,853	3,837	16.8
Pilar	5th	9,752	10,374	2,353	7.6
San Benito	6th	5,404	5,663	1,184	4.2
San Isidro	5th	7,325	8,519	1,574	6.3
Sta. Monica	5th	8,808	9,423	1,974	6.9
Socorro	4th	22,314	25,942	4,409	19
SURIGAO DEL NORTE		485,088	534,636	108,841	

Source: PSA Census 2015 and 2020, and NSCB

Table 32. Historical Growth of Population in Siargao Islands: 2000 to 2020

Municipality	2000		2007		2010		2015		2020	
	Pop'n	Annual Growth Rate	Pop'n	Annual Growth Rate	Pop'n	Annual Growth Rate	Pop'n	Annual Growth Rate	Pop'n	Annual Growth Rate
SURIGAO DEL NORTE	374,465	-3.3	409,468	1.8	442,588	2.6	485,088	1.9	534,636	1.91
SIARGAO ISLANDS	93,354	1.8	100,588	1.1	110,653	3.2	116,587	1.1	136,092	1.6
Burgos	3,043	1.8	3,851	3.4	4,058	1.8	4,034	-0.1	4,185	0.31
Dapa	19,508	3.5	22,184	1.9	23,492	1.9	23,787	0.2	29,006	2.13
Del Carmen	13,558	1.9	14,892	1.3	17,136	4.8	18,392	1.5	20,127	1.62
Gen. Luna	12,347	0.3	13,385	1.2	15,014	3.9	16,771	2.3	22,853	4.29
Pilar	8,401	0.2	8,023	-0.7	9,456	5.6	9,752	0.6	10,374	0.93
San Benito	4,750	1.1	5,275	1.5	5,505	1.4	5,404	-0.4	5,663	0.28
San Isidro	6,058	0.9	6,229	0.4	6,973	3.8	7,325	1	8,519	2.02
Santa Monica	7,757	1.4	7,916	0.3	8,715	3.3	8,808	0.2	9,423	0.78
Socorro	17,932	3.3	18,833	0.7	20,304	2.5	22,314	2	25,942	2.48

Source: PSA Census 2015, NSCB. Growth rate is computed based on PSA census data.

Table 33. Number of firms, investment and generated employment in manufacturing and production

Municipality	MANUFACTURING			PRODUCTION		
	No. of Firms	Investment (Ph M)	Employment	No. of Firms	Investment (Ph M)	Employment
Burgos	1	350,000	20			
Dapa	9	778,500	27	1	96,000	1
Del Carmen	1	40,000	2	2	50,000	5
Gen. Luna	8	2,787,000	22			
Pilar	3		9			
San Benito	1	500,000	2			
San Isidro	3	1,030,000	11			
Socorro	9	550,000	15	1	2,500	2
Sta. Monica	0	0	0			
TOTAL	35	6,160,500	90	4	148,500	8

Source: Department of Trade and Industry, Surigao del Norte and PDPFP-SDN (2018-2027)

Table 34. Number of firms, investment and generated employment in service and trading

Municipality	SERVICE			TRADING			TOTAL		
	No. of Firms	Investment (Ph M)	Employment	No. of Firms	Investment (Ph M)	Employment	No. of Firms	Investment (Ph M)	Employment
Burgos	3	750,000	7	3	150,000	3	7	1,250,000	12
Dapa	95	43,107,600	243	149	14,673,000	232	254	58,655,100	503
Del Carmen	30	17,790,000	90	92	1,941,000	119	125	19,821,000	216
Gen. Luna	143	109,804,000	330	42	8,959,000	75	193	121,550,000	427
Pilar	13	1,112,895	38	6	580,000	8	22	1,817,895	55
San Benito	1	50,000	1	3	64,000	4	5	614,000	7
San Isidro	20	8,385,000	42	83	4,270,000	102	106	13,685,000	155
Socorro	45	14,467,000	144	62	2,063,000	80	117	17,082,500	241
Sta. Monica	9	2,575,000	34	16	1,416,000	22	25	3,991,000	6
TOTAL	359	198,041,495	929	456	34,116,000	645	854	238,466,495	1,672

Source: Department of Trade and Industry, Surigao del Norte and PDPFP-SDN (2018-2027)

Literacy rate

In SIPLAS municipalities, the functional literacy rate is registered at 80%. Although the elementary school participation rate was adequate from 2006 to 2011, the secondary school participation rate was troubling, at 52% on average. Using selected educational success metrics, the gross enrolment rate for the Siargao Islands is higher, but the cohort survival rate and completion rate are also very low. This suggests an increase in out-of-school youth in the islands.

The number of schools by level of education in each municipality is presented in Table 35 and 36, respectively.

Table 35. Number of Pre-school and Elementary Schools in SIPLAS

Municipality	Pre-School			Primary	Elementary	
	DepEd	DSWD	Private		Public	Private
Burgos	5	6		37	37	
Dapa	21		2	88	86	2
Del Carmen	20		2	106	106	
General Luna	17		2	11	11	
Pilar	12			83	83	
San Benito	6			34	34	
San Isidro	12			69	69	
Sta. Monica	10		1	67	67	
Socorro	18		2	45	44	1
Total	121	6	9	540	537	3

Source: Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 (Surigao del Norte); SIPLAS PAMO CY 2020

Table 36. Number of Secondary, SHS, Tertiary and Post-Graduate Schools

Municipality	Secondary				SHS	Tertiary			Post Graduate
	National/Vocational Technical	Public	Private	SUC	Public/Private	Public	Private	SUC	Public/Private
Burgos	none	12			none	none			none
Dapa	none	35	2		none	none	1		none
Del Carmen	none	41	1	1	none	17		1	none
General Luna	none	10			none	none			none
Pilar	none	16			none	none			none
San Benito	none	8			none	none			none
San Isidro	none	22			none	none			none
Sta. Monica	none	10			none	none			none
Socorro	none	22	1		none	none	1		none
Total		176	4	1			2	1	

Source: Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 (Surigao del Norte); SIPLAS PAMO CY 2020

Health services

There are four (4) district hospitals in SIPLAS and these are strategically located in the municipalities of Pilar, Dapa and Socorro and Del Carmen and a municipal hospital in Sta. Monica. These hospitals have a bed capacity of 105 and a bed to population ratio of 1:1,075 suggesting that hospital facilities have inadequate accommodation capacity.

The number of beds, occupancy rate and health personnel by hospital and the number of health workers per municipality is presented in Table 37 and 38.

Table 37. Number of Beds, Occupancy Rate and Health Personnel by Hospital CY 2017

Hospital	Location	Classification	Category	Type	No. of Health Personnel	No. of Municipality Served	No. of Beds	Occupancy Rates (%)
Del Carmen District Hospital	Del Carmen (Siargao Is.)	Infirmery	Category 1	Public	24	2	10	20%
Pilar District Hospital	Pilar (Siargao Is.)	Infirmery	Category 1	Public		2	10	
Siargao District Hospital	Dapa (Siargao Is.)	Infirmery	Category 2	Public	104	9	50	71.40%
Socorro District Hospital	Socorro (Siargao Is.)	Infirmery	Category 1	Public	22	1	10	75.50%
Sta. Monica District Hospital	Sta. Monica (Siargao Is.)	Infirmery	Category 1	Public		2	10	
TOTAL					150		90	

Source: Provincial Development and Physical Framework Enhancement Plan 2018-2027 (Surigao del Norte)

Table 38. Number of Health Workers by Municipality CY 2018

Municipality	Total Population	No. of Brgys.	No. of BHS	NO. OF HEALTH WORKERS																	
				Doctors			Dentist			PHN/Nurse			NDP			Midwives			RHMPP		
				M	F	TOTAL	M	F	TOTAL	M	F	TOTAL	M	F	TOTAL	M	F	TOTAL	M	F	TOTAL
Burgos	4,244	6	4		1	1			0		1	1		3	3		2	2			0
Dapa	25,214	29	4		1	1			0	1		1	1	#	12		6	6		2	2
Del Carmen	19,351	20	16		1	1			0		1	1	2	6	8		4	4		3	3
Gen. Luna	17,646	19	6			0			0	1		1	3	6	9		6	6		1	1
Pilar	10,261	15	10	1		1			0	1		1	1	6	7		4	4		1	1
San Benito	5,686	6	6			0			0		1	1		4	4		2	2		2	2
San Isidro	7,707	12	4			0			0			0	1	5	6		3	3		2	2
Santa Monica	9,267	11	3		1	1			0		1	1		4	4		4	4		1	1
Socorro	23,478	14	14	1		1			0		2	2	1	5	6		6	6		3	3
TOTAL	122,854	132	67	2	4	6				3	6	9	9	#	59		37	37		15	15

Source: Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 (Surigao del Norte)

Potable water systems

Currently, around 17% of the household population in SIPLAS is covered by Level III water systems operated by local water districts. The municipalities of Dapa, Del Carmen, Sta. Monica, and Socorro are served by four (4) water districts.

Approximately 49% of households are provided by Level II water supplies, i.e. piped water from a bore well or spring system to a communal point. Level I water storage systems, such as hand pumps, shallow wells, rainwater collectors and purchased water from water distributors, serve the remaining 34% of the households.

The figures above show that very few homes have no access to water. That being said, the availability of safe or potable water still appears to be a serious issue on the islands. In reality, diarrhea is one of the island's leading causes of sickness. (*SIPLAS Strategic Master Plan, cited in the 2012 Ecotown report*)

Power and Communication Services

The energy demands of Siargao Island are being supplied by the Siargao Electric Cooperative (SIARELCO), deriving its power through a submarine cable from the mainland Mindanao Grid. All nine municipalities, including those in seven isolated barangays operated by generating sets, are served with a high 98% house link.

Communication services via Globe and Smart telecommunications firms, are accessible on the island. Community radio stations are another means of communication. Mail services are available via the post offices of municipalities and complemented by third party private courier services like LBC, JRS and J&T.

Road network

Of the 145,863 kilometers of existing secondary roads operated and maintained by the Department of Public Works and Highways (DPWH), only 57 kilometers or 39%, are well paved with cement, according to the Department of Public Works and Highways (DPWH). Unpaved all-weather roads account for approximately 89 kilometers or 61%. Figure 28 portrays the existing facilities and services in the Siargao, while Tables 38 and 39 list of DPWH road projects.

Since CY 2017, DPWH has paved the 100% or equivalent to 33.689 kilometers of the secondary road in SIPLAS with concrete and asphalt. For the tertiary road, 126.572 kilometers is operated and maintained by the DPWH 1st District with 126.33 kilometers or 99.81% are paved with concrete and gravel. Unpaved tertiary road accounts to 0.242 kilometers or 0.19%. Table 39 presented the constructed road sites in SIPLAS, while, Table 40 shows the enhancement and rehabilitation projects.

Table 39. Constructed Road Sites within SIPLAS

Constructed Road Sites	Length (kilometers)
Concreting of Brgy. Tawin-tawin to Brgy. Magsaysay	No data
Construction of Barangay Road, Brgy. San Roque, Pilar SDN	No data
Construction of Brgy. Libertad – Magsaysay Road	No data
Construction of Dapa to Sitio Lobo Road	No data
Construction of NRJ Brgy. 12 to Brgy. Osmeña Road	No data
Construction of road, Sitio Atoyay, Brgy. Sering, Socorro, SDN	No data

Constructed Road Sites	Length (kilometers)
Construction of Socorro port – Doña Helen Road	No data
Construction of Sta. Ines – Catangnan Road	No data
Widening of Jct. Del Carmen – Sta. Monica – San Isidro Road, Siargao Island	No data
Secondary Road	
Dapa-General Luna Road	14.897
Dapa- Jct. Cancohay Road	18.734
Sayak Airport Road	0.058
Tertiary Road	
Jct. Del Carmen – Sta. Monica – San Isidro Road	49.649
Jct. Cancohay – Pilar Road	21.580
Jct. Osmeña – Pilar Road	21.747
Jct. Cancohay – Del Carmen Road	0.515
Dapa – Union – General Luna Road	18.74
Socorro – Nueva Estrella – Pamosaingan Road	7.174
Jct. National Road Antipolo – Tuburan – Mabini – Quezon Road	7.167

Source: DPWH 1st District Dapa, Surigao del Norte, CY 2020

Table 40. Enhancement and rehabilitation of road projects within SIPLAS

Proposed Road Sites
Rehabilitation/Reconstruction/Upgrading of Damaged Road-Secondary Rd with 280mm Slab Pavement along Dapa-Gen. Luna Rd
Rehabilitation/Reconstruction/Upgrading of Damaged Road-Secondary Rd with 280mm Slab Pavement along Dapa-Jct. Cancohay Rd.
Preventive Maintenance-Tertiary Rd Asphalt Overlay 100mm with correction along Dapa-Union-Gen. Luna Rd.
Preventive Maintenance-Tertiary Rd Asphalt Overlay 100mm with correction along Dapa-Union-Gen. Luna Rd.
Road Widening including drainage (2-4 Lanes) along Sayak-Airport Rd. Chainage 0 - Chainage 58
Road Widening including drainage (2-4 Lanes) along Jct. Cancohay-Pilar Rd.
Road Widening including drainage (2-4 Lanes) along Jct. Del Carmen-Sta.Monica-Sn Isidro Rd.
Road Widening including drainage (2-4 Lanes) along Jct. Del Carmen-Sta. Monica-Sn Isidro Rd.
Off-Carriageway Improvement-Tertiary Rd along Jct.Nat'l Rd Atipolo- Tuboran- Quizon-Mabini Rd.
Off-Carriageway Improvement-Tertiary Rd along Jct. Del Carmen-Sta. Monica-Sn Isidro Rd.

Source: DPWH 1st District Dapa, Surigao del Norte, CY 2020

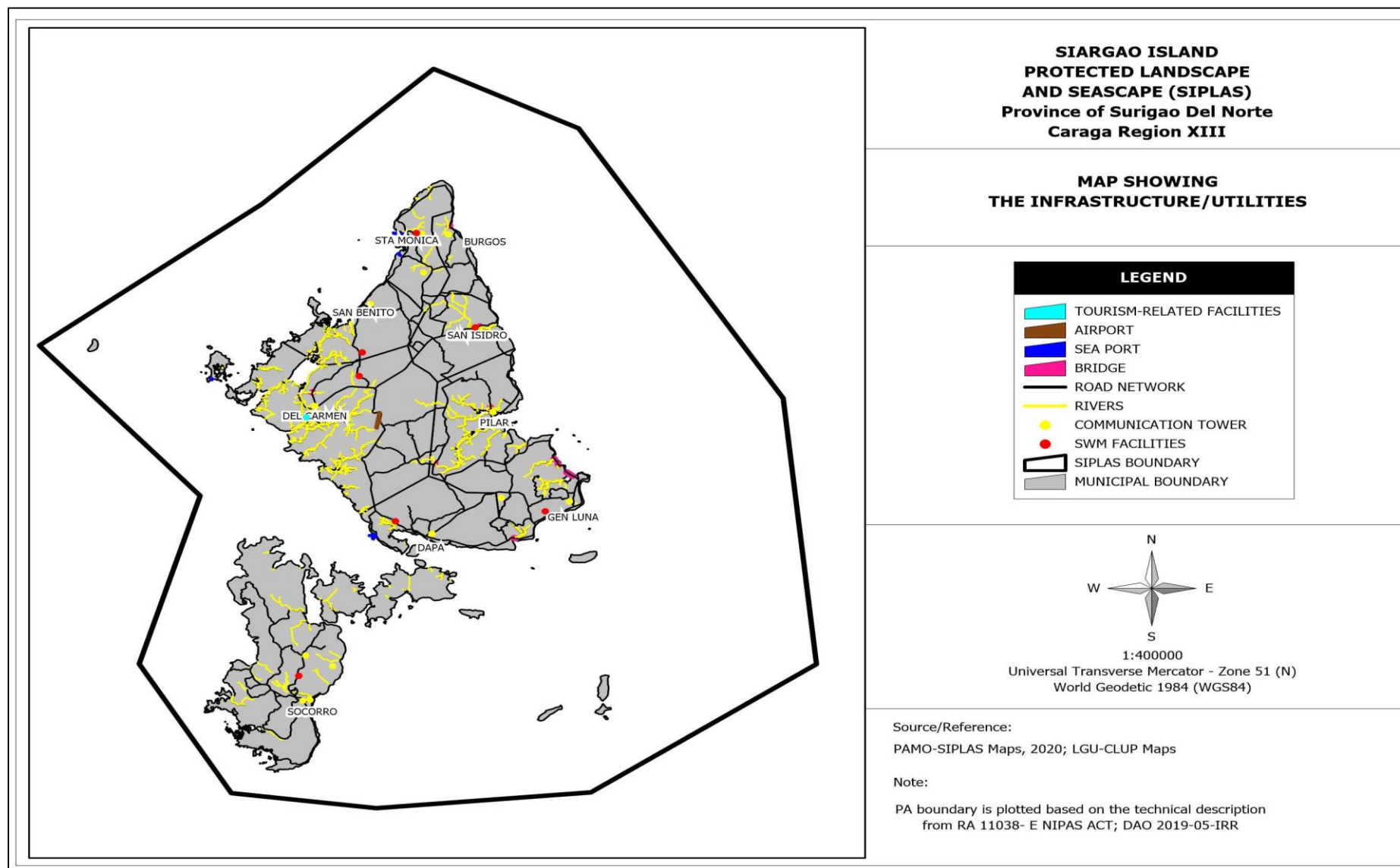


Figure 28. Map of Currently Existing Infrastructure and Utilities in SIPLAS

2.2.3 Resource Uses, Economic Activities and Values

Land Uses

Agriculture

Farming is the main source of income in SIPLAS. An approximate 30% of protected area occupants profit from farming activities. For the economic survival of the local communities, about 39,877 hectares (or 64 percent of the total land area of the Siargao Islands) are used as a processing area. Coconut, the main crop of the Siargao Islands, is cultivated on 21,198 hectares (or 81%) of this production area. Del Carmen, General Luna and Dapa have more than 3,000 hectares of coconut plantation, followed by San Isidro and Sta. Monica with more than 2,000 hectares and Burgos with 1,561 hectares as shown in Table 41. Meanwhile, Table 42 presents the major crop products in Siargao Islands, according to crop type, with coconut dominating the production volume from CY 2016 to CY 2017.

Table 41. Coconut production area and number of farmers by municipality CY 2018

Municipalities/City	No. of Coco Farmers	Area Planted to Coconut (has)	Production (MT)
DISTRICT I: Siargao Island			
1. Burgos	914	1,561	2,912
2. Dapa	3,526	3,027	6,648
3. Del Carmen	2,787	5,558	6,069
4. General Luna	2,978	3,822	5,076
5. Pilar	1,013	1,274	6,718
6. San Benito	1,546	913	2,923
7. San Isidro	1,253	2,158	2,352
8. Sta. Monica	903	2,212	2,487
9. Socorro	1,894	673	3,438
Sub-Total	16,814	21,198	38,623

Source: Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 (Surigao del Norte)

Table 42. Major Crop Production CY 2016-2017

CROPS	HARVEST AREA (HAS)			PRODUCTION (M.T.)		
	2015	2016	2017	2015	2016	2017
Palay	20,642.00	18,869.00	17,592.00	60,576.00	49,608.00	52,559.00
Corn	768.00	595.00	560.00	1,386.00	983.00	895.00
Coconut	60,729.00	60,729.00	60,729.00	199,839.71	168,335.04	165,368.35
Banana	1,360.00	1,359.50	1,351.50	6,410.00	5,733.56	5,958.55
Abaca	81.00	81.00	81.00	5.00	4.86	4.43
Coffee	12.00	12.00	12.00	3.00	1.60	1.56
Cacao	70.00	70.00	70.00	7.00	2.83	2.79
Watermelon	135.00	120.00	120.00	1,314.00	1,111.65	1,007.72
Vegetables (all kinds)	119.17	75.83	78.93	760.69	472.73	554.49
Rootcrops (all kinds)	584.00	514.00	527.86	4,362.20	3,795.32	3,964.54
Fruit (all kinds)	1,076.00	1,650.20	1,644.20	1,693.12	5,591.29	5,823.48
TOTAL	85,576.17	84,075.53	82,766.49	276,356.72	235,639.88	236,139.91

Source: Provincial Development and Physical Framework Enhancement Plan 2018-2027 (Surigao del Norte)

Rice is grown on the 4,128 hectares about 10% of total production area, with more than 75% of these rice fields being rainfed. This means that the period of production of rice depends heavily on the start of the rainy season. As a result, it is particularly vulnerable to the irregular rainfall patterns caused by climate change. Figure 29 shows the ricefields in SIPLAS.

However, there are some local rice farmers who use lagoons and natural ponds as a small water-impounding method for irrigating crops. The municipalities of Del Carmen, Burgos, and San Isidro have small irrigation systems.



Figure 29. One of SIPLAS ricefields, CY 2021

➤ Settlement

In SIPLAS, built-up or settlement areas occupy 2,496 hectares spread across 132 barangays. The bulk of the larger settlements are clustered along the coast. The Del Carmen and Dapa municipalities have the highest built-up areas, followed by Socorro and General Luna. The administrative/settlement map of Siargao is presented in Figure 30.

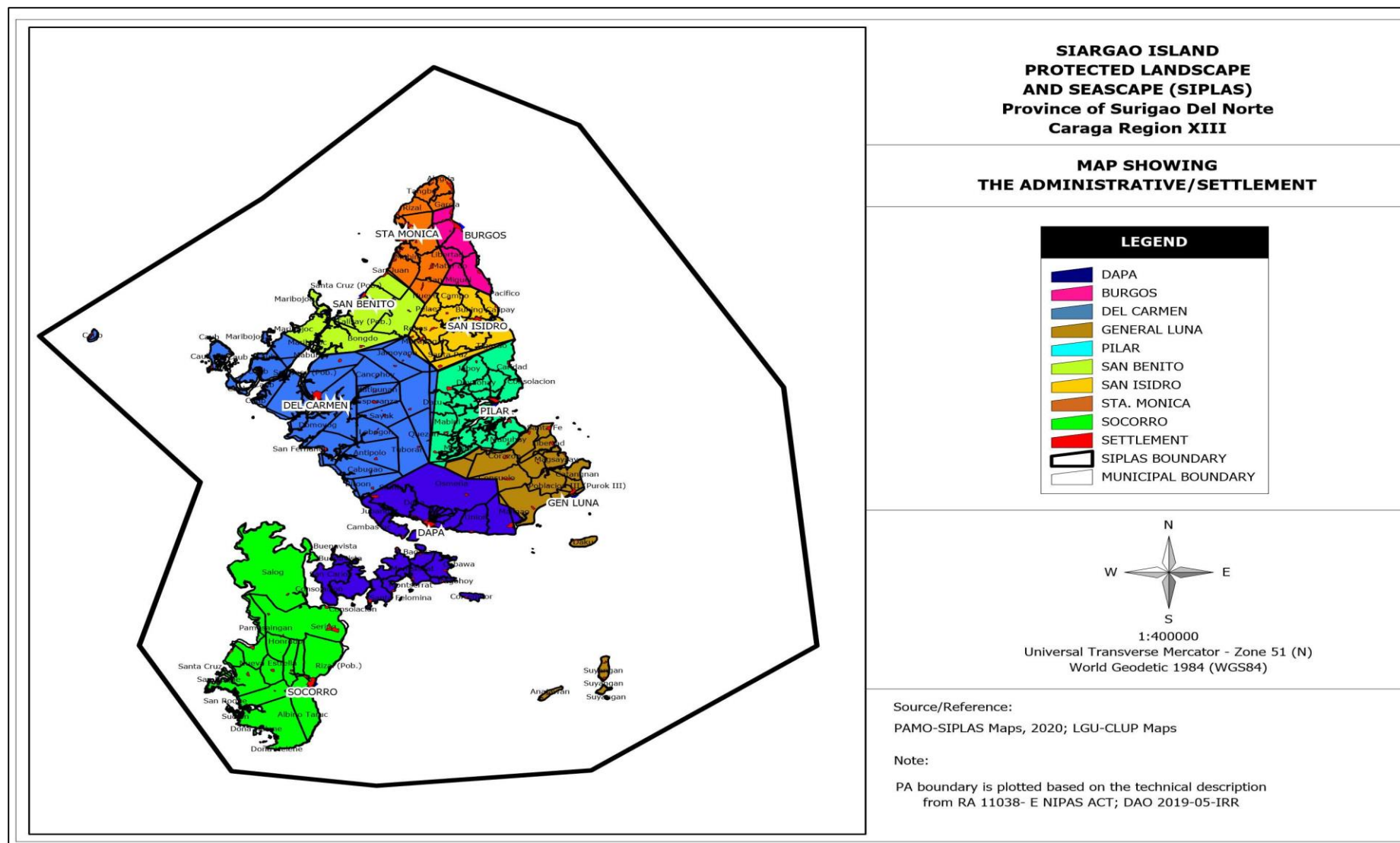


Figure 30. SIPLAS Administrative and Settlement Map

Source: SIPLAS PAMO, CY 2020

➤ Ecotourism

SIPLAS have a high tourist appreciation due to their warm climate. Its location and exposure to gusty winds from the Pacific Ocean that produce waves from 6 to 12 feet make the region one of the best surfing spots in the world, particularly the municipality of General Luna. White beaches prevail in SIPLAS due to dense limestone deposits in small island systems.

SIPLAS promoted major ecotourism destination and activities in the nine (9) municipalities as listed in Annex 14.

The promotion of SIPLAS as one of the major eco-tourism destinations has led to the growth of various eco-tourism sites and activities. As shown in Table 43, the consolidated tourist arrival from CY 2017 to CY 2018 has recorded an increase of 174%. The locals are still dominating the tourist arrival in the locality as presented in Table 44. In CY 2019, tourist arrival recorded 257,900 both foreign and local tourist with an increase of 20%.

Table 43. Consolidated Annual Comparative Statistics of Tourist Arrival CY 2018

MONTH	MAINLAND SIARGAO ISLAND		% Increase/ Decrease
	2017	2018	
January	15,145	17,907	18.24%
February	14,244	17,179	20.61%
March	16,222	21,064	30%
April	13,737	15,521	13%
May	11,530	21,081	82.85%
June	14,591	13,750	5.80%
July	16,824	15,703	6.70%
August	17,132	18,005	5.10%
September	18,491	16,877	8.73%
October	17,273	18,142	5.03%
November	19,686	18,597	5.53%
December	17,479	12,277	30%
TOTAL	192,354	206,103	174.83%

Source: Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 (Surigao del Norte)

Table 44. Tourist Arrivals by Category CY 2018

MONTH	Foreign	Domestic	Total
January	4,196	13,711	17,907
February	5,291	11,888	17,179
March	5,042	16,022	21,064
April	4,296	11,225	15,521
May	5,032	16,049	21,081
June	4,576	9,174	13,750
July	2,465	13,238	15,703
August	6,943	11,062	18,005
September	4,557	12,320	16,877
October	5,700	12,442	18,142
November	5,956	12,641	18,597
December	3,479	8,796	12,277
TOTAL	57,533	148,568	206,103

Source: Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 (Surigao del Norte)

These ecotourism sites are the major contribution to the development potential of the future of tourism industry in the island. To date, only LGU Dapa has been collecting Php 10.00 environmental fee in their respective seaports.

Likewise, the potential values of SIPLAS has been quantified in peso through the collection of protected area entrance fees which will be collected in seaports and airports. The entrance fees specified in Table 45 will be directly deposited in SIPLAS IPAF account.

Table 45. Proposed entrance fee in SIPLAS

Types of Tourists	Entrance Fee	Conservation Fee	Total amount of entrance fee
Local Tourist: Student- 7 yrs. old above, except Siargaonon	15	10	25
Local Tourist: Adults, except Siargaonon	30	10	40
Foreigner	100	10	110

Source: SIPLAS PAMO, CY 2020

There are already established and available tourist facilities including resorts and restaurants in the island that cater to the accommodation needs of both the domestic and foreign tourists, the number of which is presented in Annex 15. The 70% of tourism facilities primarily beachfront resorts, hotels, restaurants and home stays are along the coast in the municipality of General Luna. Many of these structures have been set up and expatriates are operating them.

Meanwhile, Table 46 presents some historical, religious and cultural attractions in SIPLAS, which mean that the local give so much importance also to their cultural heritage. Figure 31 shows the regions and known eco-destination in the island.

Table 46. Historical, Religious and Cultural Attractions in SIPLAS

LOCATION	DESCRIPTION
Socorro	Colorum Uprising 1924 Mass Graveyard in Pamosaingan.
	Atoyay Agri-Fishery Demonstration
Del Carmen	Old Catholic Limestone Church
	Shipreckered World War II Warship
Dapa	Old tribunal Building and Jail Yard. Proposed to be restored by the LGU
General Luna	Burial Cave (Metal Age 500BC-500AD)
	Old Catholic Limestone Church
Sta. Monica	Old Catholic limestone church
San Isidro	Macapagal Underground chapel
San Benito	Century Old Acacia Tree

Source: Municipal Profiles and CLUPs, CY 2020



Figure 31. Del Carmen Catholic Church and Cloud 9 boardwalk.

Coastal and Marine Uses

➤ **Fisheries**

Fishing is the second source of income in SIPLAS next to farming which serves about 24% of SIPLAS population. More than half of the region's fish demand is supplied by Siargao and Bucas Grande Islands. About 784 hectares of fish farms and aqua-mariculture areas exist in six (6) barangays in Socorro alone as shown in Table 47. Around 1,500 hectares of aquaculture and marine sanctuary have been identified in San Benito.

Table 47. Existing Fisheries Production Areas

Municipality	Barangay	Fisheries Management Areas	Area (ha)
Socorro	Sering	Fish Farming/Aqua-Mariculture	10.37
	Salog	Fish Farming/Aqua-Mariculture	398.52
	San Roque	Fish Farming/Aqua-Mariculture	139.21
		Bangus Fry Gathering Area	25.52
	Dona Helene	Fish Farming/Aqua-Mariculture	167.05
	Sering	Fish Farming/Aqua-Mariculture	24.5
	Sudlon	Fish Farming/Aqua-Mariculture	18.95
Total			784.12

Source: Provincial Development and Physical Framework Enhancement Plan CY 2018-2027 (Surigao del Norte)

➤ **Marine Protected Areas**

There are twenty (20) existing LGU-managed Marine Protected Areas (MPAs) with an approximate area of 1,438.37 hectares in SIPLAS as presented in Table 48. These were created by local legislation, some of which date back to the 1990's. There are thirteen (13) proposed MPAs within SIPLAS as shown in Table 49.

Table 48. Existing Marine Protected Areas (MPAs) by Municipality

Municipality	Barangay	Habitat	Area (hectares)	Year Established	Legal Instrument
Burgos	Poblacion 1	Coral reef; sea grass	28	2010	Municipal Ordinance No.1, series of 2009
Dapa	Corregidor	Coral reef; seagrass	75	1990's	Municipal Ordinance No. 01, series of 2006; Municipal Ordinance No. 05, series of 2017
Del Carmen	Caub	Coral reef; seagrass	51.5	2014	Ordinance # 02 series of 2014 (sanctuary) MAA ordinance # 015 series of 2017
	San Fernando	Coral reef; seagrass	33	2014	
	Hali-an	Coral reef; seagrass	20	2017	Municipal Ordinance
General Luna	Daku, Pob. 1 and Malinao	Coral reef; seagrass	500	2015	Local Ordinance
Pilar	Centro, Punta, Asinan, Pilaring (CPAP)	Coral reef; mangrove; Sea grass	114	2013	Municipal Ordinance no. 002 series of 2013
	Salvacion	Coral reef, seagrass	25	2017	Municipal Ordinance
San Benito	Maribojoc	Coral reef; mangrove	33	2008	Municipal Ordinance No. 079-15, series of 2015
	Talisay	Coral reef; mangrove			Municipal Ordinance No. 068-10 series of 2010
San Isidro	Tigasao	Coral reef	28	2015	Municipal Ordinance No. 2015-04
Sta. Monica	T. Arlan	Coral reef; sea grass	118	2016	Municipal Ordinance No. 057, series of 2016
	Rizal	Coral reef; sea grass	38.87	2017	Municipal Ordinance No. 069 series of 2017
	Alegria	Coral reef; sea grass	43	2017	Municipal Ordinance No. 069 series of 2017
Socorro	Pamosaingan	Coral reef; seagrass	54	1990's	Municipal Ordinance No. 03 series of 2003
	Kanlanuk Bay	Coral reef	37		
	Salog	Coral reef	30		
	Sering	Coral reef	25		
	Dona Helene	Coral reef	25		
	Sta. Cruz	Coral reef	30		
Total			1,438.37		

Source: SIPLAS PAMO, CY 2020

Table 49. Proposed Marine Protected Areas (MPAs) in SIPLAS

Municipality	Barangay	Habitat	Area (hectares)
Burgos	Baybay	Coral reef	27
Dapa	Union	Coral reef; seagrass	69
	Buenavista	Coral reef; seagrass	120
Del Carmen	Cabugao	Coral reef; seagrass	78
General Luna	Anajawan	Coral reef; seagrass	50
	Suyangan	Coral reef; seagrass	60
	Catangnan	Coral reef; seagrass	25
	Sta. Fe	Coral reef; seagrass	30
Pilar	Caridad	Coral reef; seagrass	20
San Isidro	Pacifico-Tigasao	Coral reef	34
Santa Monica	Tangbo	Coral reef; seagrass	80
	Abad Santos	Coral reef; seagrass	31
	Magsaysay	Coral reef; seagrass	50
Total			654

Source: SIPLAS PAMO, CY 2020

➤ **Surfing and Game Fishing Recreation**

Surfing and sport fishing in the SIPLAS are big attractions. A surfing competition is held annually in General Luna, while an annual international sport fishing competition is organized by Pilar. Figure 32 depicts SIPLAS's different coastal and marine tourism activities.

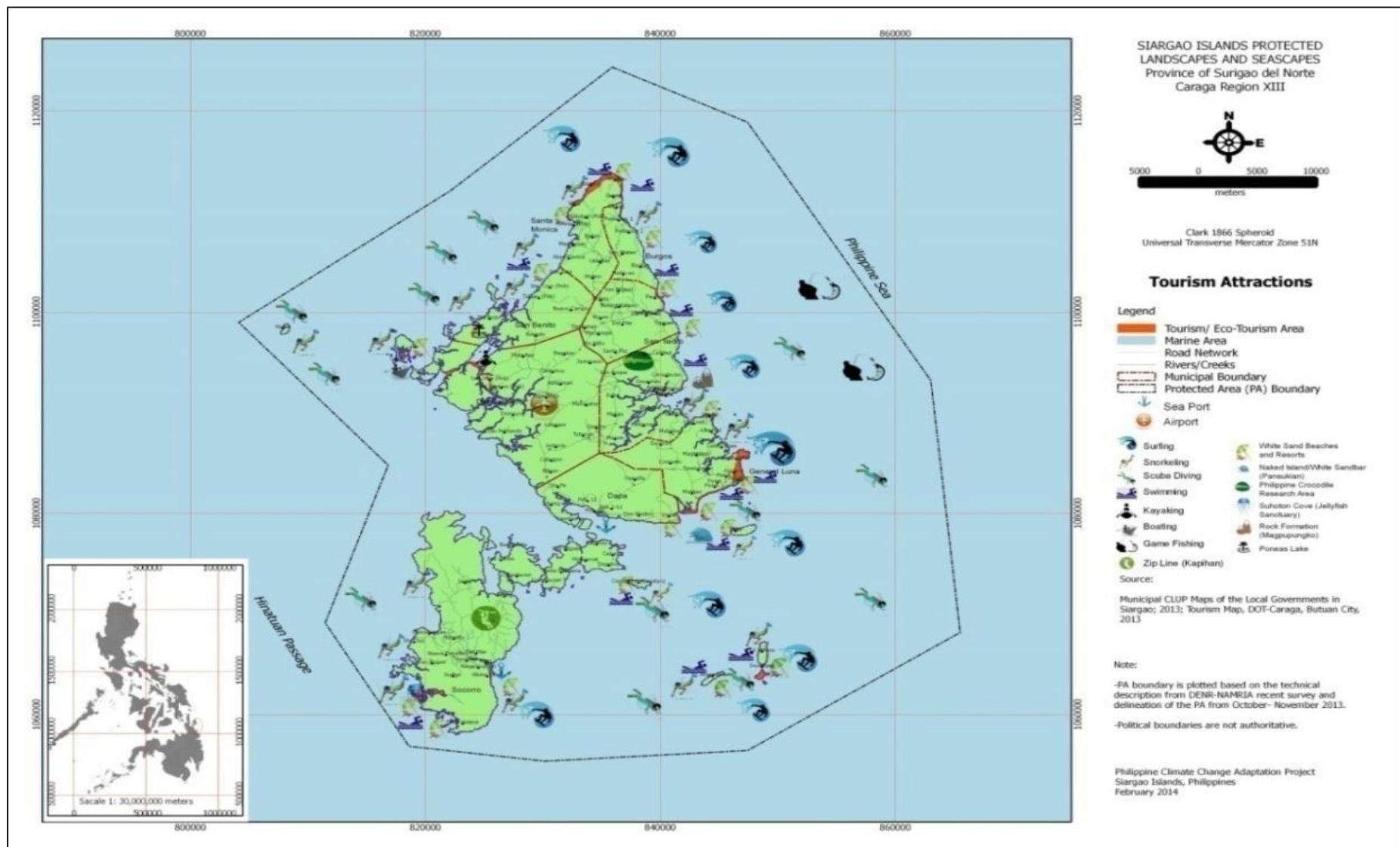


Figure 32. Tourism Activites in SIPLAS

Source: SIPLAS PAMO, CY 2020

Other Economic Activities

Non-timber product collection, livestock raising, provision of manual labor services (including manual labor in quarry operations), operation of enterprises, and private and public sector jobs are some of the other sources of income for the residents in SIPLAS. Orchids, honey bees, rattan and native bamboo are forest products that are cultivated and labeled as non-timber products.

Due to the popularity of SIPLAS eco-destinations, tourists visiting the island have dramatically increased in CY 2020, thus, majority of SIPLAS residents have shifted its livelihood to service providing. Mostly locals are involved in the following eco-tourism services such as boat operating during island hopping, tour van drivers, public utility transportations, tour guiding/ operator, receptionists/attendance and housekeeping staffs, travel agents, life guards, security guards, restaurants chief cooks, wine attendants/sommelier, PR managers and spa attendants.

2.3. Current and proposed programs and projects

SIPLAS Local Government Units (LGUs) implement various programs, projects and activities that impact the state of the protected area. Programs, projects and activities conducted for the previous five (5) years (CY 2015-2020) which maybe directly or indirectly related to SIPLAS management were reviewed. The presented programs, projects and activities in Table 50 provides a snapshot of local priorities interms of the use of resources on actions that may have long-term effects on SIPLAS.

Table 50. Summary of SIPLAS LGU programs, projects and activities CY 2015-2020.

Program/Project/Activity	Proponent
Trainings and Seminars on Coastal and Fishery Laws Enforcement, IEC on Fisheries Laws	All LGUs and NGOs, PAMO SIPLAS
Procurement of Logistics Support and Equipment for Bantay Dagat, MCS and Seaborne Patrols	All LGUs and NGOs
Wastewater, Septage Treatment and Dislodging of Septic Tanks	All LGUs and NGOs
Garbage Collection	All LGUs and NGOs
Coastal Resource Management	Rare Philippines and nine (9) SIPLAS LGUs
Artificial Reef	DENR and nine (9) SIPLAS LGUs
Updating of CLUP	Nine (9) SIPLAS LGUs
Tree Planting and Coastal Clean-up	NGAs, NGOs and nine (9) SIPLAS LGUs
Community Watershed Management	All LGUs and NGOs
Biodiversity Friendly Livelihood Programs	All LGUs and NGOs
Monthly Environmental Celebrations through coastal clean-up, tree planting, and CEPA	All LGUs, NGAs and NGOs
Ecotourism Development	All LGUs and SIPLAS PAMO

Source: SIPLAS LGUs, CY 2021

Likewise, the following SIPLAS programs, projects and activities were implemented by the DENR for the same time period, which complements the local governments efforts on SIPLAS management:

1. Natural Resources Conservation and Development

Protected Areas, Caves and Wetlands Development and Management Sub-Program

The management of SIPLAS covers the protected area habitat protection [includes the conduct of Biodiversity Monitoring Systems (BMS), Biodiversity Assessment and Monitoring System (BAMS) patrolling, maintenance of protected area facilities, installation of signages and conduct of CEPA], CEPA campaigns on SIPLAS, hiring of

forest protection officers (FPOs), PAMB Operations (includes staff capacity building and conduct of Training Needs Assessment), Ecotourism Development (includes maintenance of ecotourism facility, enhancement of ecotourism management and ecotourism site development in partnership with LGUs), Resource Assessments (includes BMS, FGD, data compilation using field methods, data analysis and trend identification and validation of results with protected area occupants), procurement of supplies and maintenance, hiring of project support staffs, Socio-Economic Assessment and Monitoring Systems (SEAMS), Management of Caves and wetlands (including geotagging and assessments).

Wildlife Resources Conservation Sub-Program

The activities include the population monitoring of Philippine Cockatoo and Philippine Tarsiers, as well as, the monitoring of sea turtles nesting sites.

Coastal and Marine Ecosystem Rehabilitation Sub-Program

Provide Technical Assistance to LGUs on the management of coastal and marine resources, Marine Protected Area Networking (MPAN), Marine Protected Area (MPA) patrolling, Response Plan on Natural Damage Occurrence for SIPLAS, maintenance and protection of coastal and marine ecosystems namely: Coral Reef, Mangrove forest and Seagrass beds, (including reduction of threats and pressures identified), maintenance and protection of equipment purchase (pumpboat, compressor, SCUBA gears, and monitoring stations), Biodiversity-Friendly Enterprise (BDFE) development [development of BDFE in coastal community, capacity building (attendance to enhancement trainings on CMEMP implementation, training on MPA management)], hiring of Coastal Extension Officers, augmentation fund for CEPA activities, CEPA/tree planting/coastal clean-up on environmental events, and development and implementation of flagship communication campaign for SIPLAS.

Intensified Forest Protection and Anti-Illegal Logging

Provision of institutional support in investigation, filing of information and/or criminal complaints and prosecution of forestry cases, maintenance of acquired equipment, construction/improvement of infrastructures, sustain a well planned CEPA campaigned, consistent apprehension and mandatory administrative adjudication and confiscation of apprehended forest products including conveyances and other implements, sustain implementation of LAWIN forest and Biodiversity Protection System, enforcement of protected area/wildlife, cave laws, coastal and marine rules and regulations [include the compliance monitoring of wildlife permit holders, operation and mobilization of Wildlife Traffic Monitoring Units, mobilization of Wildlife Enforcement Officers (WEO)], issuance of tenurial instruments within protected area, and inventory of water users and identified water sources in SIPLAS.

2. National Greening Program

This includes regular maintenance and protection of NGP plantations established in CY 2012 and improvements in the adaptive capacities of human communities and natural systems.

3. Environment and Natural Resources Resiliency Program

This include watershed characterization and vulnerability assessments.

2.4. Threats, Issues and Concerns

SIPLAS is known for its beautiful and majestic natural resources from its intact forest and beautiful lagoons to white sand beaches and clear blue seawater. However, due to the sudden influx of the number of tourists visiting the island and the drastic increase of resorts and recreational establishments inflict pressure in the environment particularly the changes in land use and land cover, including the conversion of forest land for agricultural and non-agricultural purposes.

These challenges have resulted in the destruction of forests and land degradation, soil loss and fertility depletion, water quality deterioration and loss of opportunities for biodiversity. The impacts of climate change that add strain on the atmosphere and negatively affect habitats and populations in various ways are added to these challenges.

Most of the high significant values threats are recorded from residential and commercial development within a protected area, invasive and other problematic species and genes, pollution entering or generated within a protected area, and specific cultural and social threats.

Based on the tallied results of METT survey as shown in Table 51, there are six (6) identified medium substantial threats in SIPLAS, which are considered as significantly degrading values.

Table 51. High substantial threats in SIPLAS based on the METT survey CY 2021.

Threats	Percentage Rating
1. Residential and commercial development within a protected area	
1.1 Housing and settlement	49
1.3 Tourism and recreation infrastructure	50
8. Invasive and other problematic species and genes	
8.1 Invasive non-native/alien plants	64
9. Pollution entering or generated within protected area	
9.1a Household sewage and urban waste water	59
9.4 Garbage and solid waste	49
12. Specific cultural and social threats	
12.5 Loss of support to communities and projects due to changes in political leadership	57

Source: SIPLAS MEA-METT, CY 2021

Threats identified are of the medium significant values which include invasive non-native/alien plants ranking 1st with 64%, followed by household sewage and urban waste water ranking 2nd with 59%, loss of support to communities and projects due to changes in political leadership at 3rd with 57%, tourism and recreation infrastructure at 4th with 50%, housing and settlement, and garbage and solid waste are at 5th with 49%. These threats are graphically presented in Figure 33.

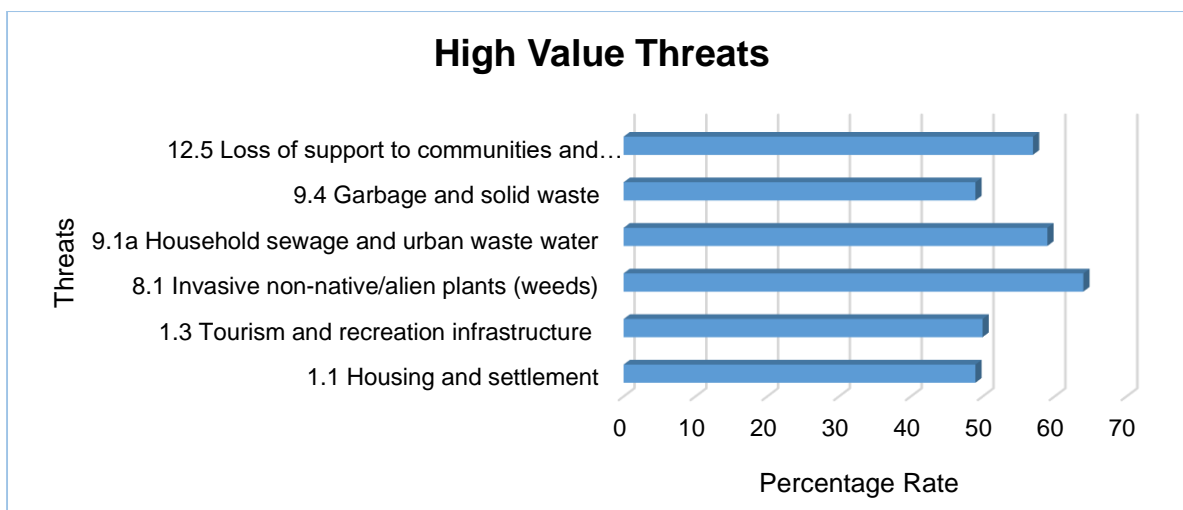


Figure 33. Graphical representation of High Values Threats gathered from KII, CY 2021
Source: SIPLAS MEA-METT, CY 2021

As presented in Table 51 and Figure 33, the following are the threats that have a significant value which are elaborately discussed below in relation to its possible impacts in SIPLAS ecosystems and biodiversity. These threats will be prioritized in designing management interventions to improve SIPLAS management.

- *Housing and Settlement* – is one of the major threats in SIPLAS which occupies 2,496 hectares that spread across 132 barangays. The bulk of the larger settlements are clustered along the coast. The municipalities of Del Carmen and Dapa have the highest built-up areas, followed by Socorro and General Luna. With increasing settlements, timberland areas are converted and developed to residential and agricultural area.

It is also perceived that coastal developments such as the building of infrastructures are threats to seagrass beds. The coastal waters in Dapa, Pilar, San Benito, and Socorro are being utilized as residential infrastructures, many houses or settlements are built inside and adjacent to the coastal water which causes other threats such as siltation and improper solid wastes management (SIPLAS PAMO Seagrass Monitoring, 2021).

Further, during the mangrove monitoring, there are eighteen coastal barangays observed with settlements which are located within and along the mangrove area of Brgy. Sta Fe and Brgy. 1 in the municipality of Dapa; Brgy. Del Carmen, Brgy. Bitoon, Brgy. Antipolo, Brgy. Cabugao, Brgy. San Jose, all in the municipality of Del Carmen; Brgy. Libertad, Brgy. Malinao, Brgy. Sta. Cruz, all in the municipality of General Luna; Brgy. Piling, in the municipality of Pilar; Brgy. Bongdo, and Brgy. Maribojoc both in the municipality of San Benito; Brgy. Del Carmen (Pob.) in the municipality of San Isidro; Brgy. Pamosaingan and Brgy. Rizal both in the municipality of Socorro; and Brgy. Magsaysay and Brgy. T-Arlan both in the municipality of Sta. Monica.

- *Tourism and recreation infrastructure* - Major tourist locations in SIPLAS have been listed as priority development areas by the Provincial LGU. To date, infrastructures in SIPLAS covers approximately 171.74 hectares and more projects on tourism-related facilities and infrastructures are in the works (SIPLAS Management Plan 2021-2030).

Coastal landscapes are being transformed as a consequence of the increasing demand for urban infrastructure to sustain commercial, residential and tourist activities. Coastal development (e.g. boardwalks and docking warf/area) has occurred, frequently, without proper planning and consideration of natural habitat environments. It causes loss of semi-natural and natural land, destruction and fragmentation of coastal habitats, and is also related to increased erosion levels and increased discharge of diffuse pollution and marine litter to the marine environment.

Coastal development is often observed in some urban and industrialized cities. Reclamation in coastal areas is carried out to cater establishments and infrastructure projects. In Siargao, in spite of being a protected area, embankment in seagrass area can still be observed undertaken mostly by Local Government Units. Others were facilitated by individuals being the owner or claimant of the adjacent area. Sadly, this activity can be observed in Dapa, SDN. On-going filling of land in the intertidal zone was observed during the sampling and monitoring as reported in Seagrass CY 2021 monitoring. A total of 360 m² of the coastal waters has been filled in as of February 26, 2021. This threat was not observed last CY 2020 seagrass monitoring.

Further, roads or trails were also observed and documented in the mangrove area of Brgy. 1, Dapa and Brgy. Bongdo, San Benito both with trails made of riprap while Brgy. Libertad, General Luna is observed to have road infrastructure along its mangrove area. Likewise, there are four (4) coastal barangays recorded with boardwalk, port and wharf infrastructures, which include Brgy. Del Carmen, Brgy. Domoyog, and Brgy. Antipolo, all in the municipality of Del Carmen, and Brgy. T-Arlan, in the municipality of Sta. Monica. A school building infrastructure was also recorded with an area of 6,447m² was recorded adjacent and along the mangrove area of Brgy. Pilaring, Pilar.

- *Invasive non-native/alien species of plants and animals* – plants and animals that are non-native in SIPLAS ecosystem are called invasive alien species which may cause economic and environmental harm. The adverse effect of these species to the environment include decline/elimination of native species through competition, predation, and disruption of ecosystem functions. These species threatened development through their impact on agriculture, forestry, fisheries and natural system which are ecological balance in SIPLAS.

One of the threats in SIPLAS is the proliferation of invasive species like tree species of falcata (*Paraserianthes sp.*), mahogany (*Swietenia macrophylla*), gmelina (*Gmelina sp.*), and mangium (*Acacia sp.*). Red-vented bulbul, common starling, are some of the examples of exotic fauna observed in SIPLAS.

- *Household Sewage and Urban Waste Water* – In CY 2020, the total population in SIPLAS was 136,092 or 25,262 households. The population of the nine (9) LGUs accounts for about 25% of the province total population. The most populated municipality in SIPLAS are Dapa that covers 21.3% of the population followed by Socorro which covers 19%, and General Luna covers 16.8%. These three (3) municipalities are the island's main commercial and trade hubs (SIPLAS Management Plan 2021-2030). With this significant number, it produced sewage that run downstream. Currently, no sewage treatment plant existing in SIPLAS which is necessary in cleaning waste water or discharge thereby protecting the environment.

Disposal of sewage effluent in coastal areas could result to introduction of pollutants that may cause harmful impact to the physical and chemical properties of the coastal and marine ecosystems leading to the death of many aquatic resources.

Further, it was also observed that the waste water from Dapa public market is being drained to the coastal waters which makes the seagrass area slightly turbid. Pollution of coastal environments, either from point or diffuse sources, can result in significant changes in water and sediment quality, which in turn can influence growth of seagrass beds negatively (Seagrass monitoring, CY 2021).

- *Garbage and Solid Waste* – One of the pressing issues in SIPLAS is the ecological solid waste management. Considering that Siargao Island is one of the top eco-destination internationally, rising population and settlement growth pose garbage and solid waste issues, contributing to the degradation of water sources and degradation of coastal habitats. In the Siargao Islands, it is critical to promote effective solid waste and wastewater management techniques as well as the establishment of adequate facilities.

Further, during the seagrass monitoring for CY 2020-2021, it was reported that there were many debris or pollutants observed along the coastline of Dapa, Pilar, San Benito, and Socorro. The solid waste is composed of sacks, plastic bottles, plastic wrappers, clothes and tin cans. In spite of the efforts exerted by the LGUs to properly managed solid wastes, still these efforts were not enough to prevent the solid wastes in taking over our coastal waters. This is mainly due to the lack of proper management in the disposal of domestic wastes.

- *Loss of support to communities and projects due to changes in political leadership* – Political leadership is fundamental to the success of rural and urban regeneration. Political leadership is essential to properly managed the locality they are assigned to. In SIPLAS, once a political leader is seated, the conceptualization and implementation of projects are their top priority, however, once there is a new political leader seated, the sustainability of the project are mostly sacrificed.

Sometimes, due to the change in political leadership, political behaviour of the community arised such as supporters of the previous leader will not follow/support the concurrent leader.

III. MAP INFORMATION

SIPLAS PAMO had conducted series of assessments and monitorings of SIPLAS various ecosystems and sub-ecosystem types to valuate its services which will be illustrated in a biodiversity map.

3.1 Map of Biodiversity

Biodiversity map is a cartographic representation of any SIPLAS biodiversity data that have spatial and temporal units. It refers to mapping of species, populations or ecosystems, eyeing on their presence or count within an area at a specific time.

SIPLAS biodiversity map as presented in Figure 34 includes the following data:

- ✓ Terrestrial habitats;
- ✓ Watershed;
- ✓ Assessed and inventoried caves;
- ✓ Assessed and inventoried wetlands;
- ✓ Philippine Tarsier Population;
- ✓ Existing and proposed Marine Protected Areas (MPAs);
- ✓ Installed Artificial Reefs;
- ✓ Seagrass cover;
- ✓ Mangrove cover;
- ✓ Coral cover;
- ✓ Sea turtle nesting sites

These biodiversity data are located both in the Strict Protection zone (SPZ) and Multiple Use zone (MUZ) in SIPLAS.

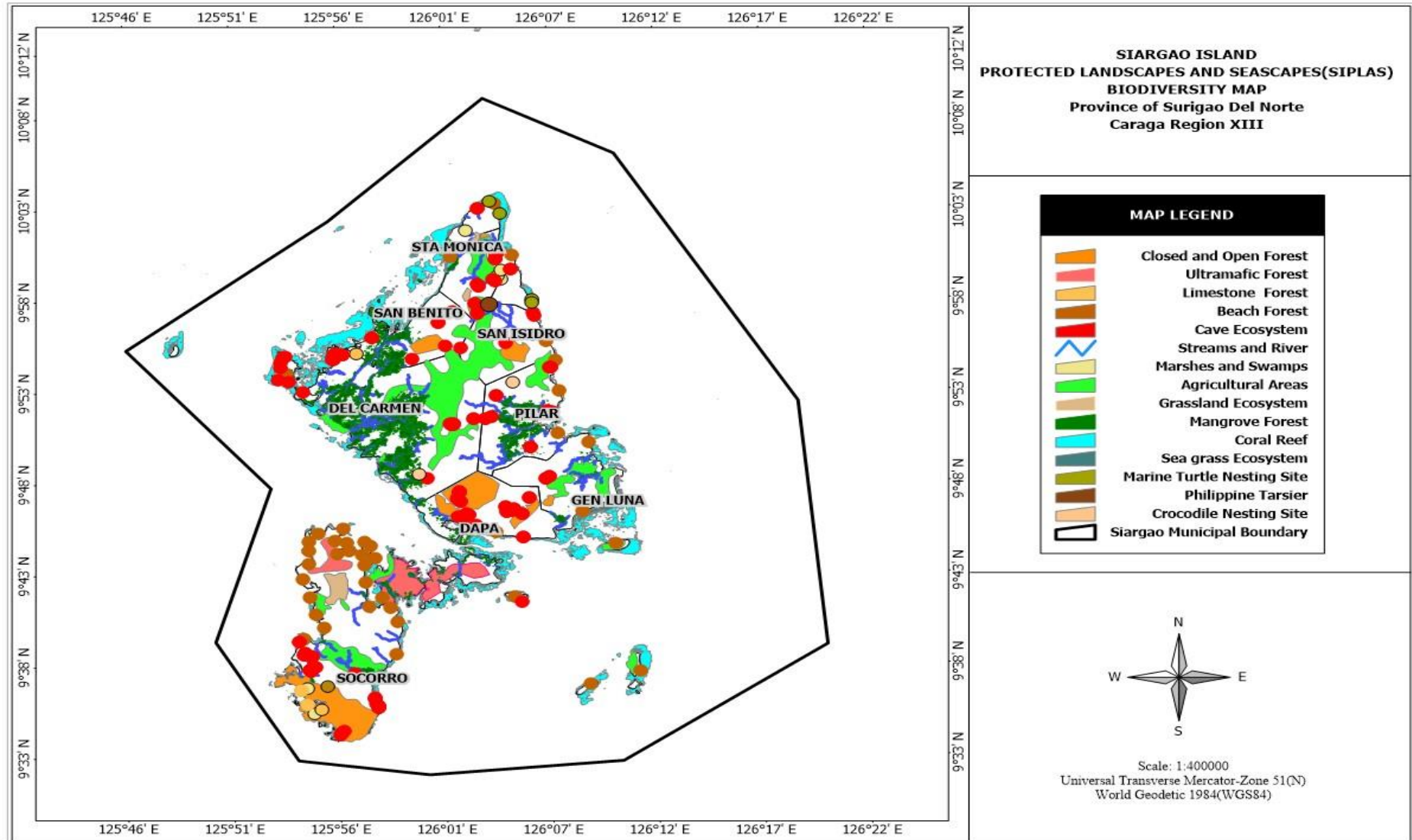


Figure 34. SIPLAS Biodiversity Map.

Philippine Tarsier Population

The Philippine Tarsier was classified as an endangered species in 1986 in response to the rapid habitat destruction throughout the archipelago. Since that time, it has been reclassified as data deficient and more recently as near threatened despite a significant lack of information on the population density of the species.

A population survey of the Philippine Tarsier was conducted in the forested areas of Barangay Sudlon, Socorro and recently in Barangay San Miguel, San Isidro all of the province of Surigao del Norte and positively documented its presence.

PAMO SIPLAS was able to document five (5) Philippine Tarsiers during the population baseline assessment and monitoring. Details of the observation is presented in Table 52 and the location where the Philippine Tarsier was observed is shown in Figure 35.

Based on the estimated survey, population from five (5) to fifteen (15) individuals of Philippine Tarsier are present in the said area with an estimated ratio of two (2) to four (4) males and three (3) to eleven (11) females.

Table 52. Summary information on the Philippine Tarsier encountered at Brgy. San Miguel, San Isidro, Surigao del Norte.

	Stations where the Philippine Tarsier sighted				
	Station 3*	Station 4**	Station 6**	Station 4***	Station 4^
Time of sighting	2000H to 2260H	1833H	1825H	05:07H	2170H
Number of individual/s	1	1	1	1	1
Maturity	Adult	Juvenile	Juvenile	Adult	Adult
Estimated Total Body Length	400 mm	101 mm	101 mm	300 mm	300 mm
Height of the location of individual/s on the tree with respect to the ground	4 meters	1 m from ground	4 m from ground	2 m from ground	2 m from ground
Activity of the tarsier when first detected	Clinging onto a tree trunk	Clinging onto a tree trunk	Clinging onto a tree trunk	Clinging onto a tree trunk	Eating a cricket and clinging onto a tree trunk
Species of plant where the tarsier was sighted in	Sabon-sabon/Kangko (<i>Aphanamixis polystachya</i>)	Bago (<i>Gnetum gnemon</i>) tree	Locally known as Among Tree	Bago (<i>Gnetum gnemon</i>) tree	Tabon tree
GPS coordinates	9°57'57"N 126°3'44"E	9°57'57"N 126°3'48"E	9°57'54"N 126°3'32"E	9°57'57"N 126°3'48"E	9°57'57"N 126°3'45"E
Potential Sleeping site/s	Unidentified	Hole in the ground	Rock Crevices	Hole in the ground	Hole in the ground

* - Tarsier sighted during the assessment on March 3, 2021; ** - Tarsier sighted during the 1st monitoring on May 26, 2021

*** - Tarsier sighted during the 2nd monitoring July 27, 2021; ^ - Tarsier sighted during the 3rd monitoring October 21, 2021

Source: SIPLAS PAMO Consolidated Report on the conduct of Philippine Tarsier (*Tarsius Syrichta*) Population Monitoring and Updated Distribution Map

Sea Turtle Nesting Sites

PAMO SIPLAS extended technical assistance to the municipality of Sta. Monica last March 2021 and May 2021 and as part of the Pawikan Conservation Initiative, marine turtle nesting sites have been identified and mapped at Brgy. Alegria, Sta. Monica, Surigao del Norte as shown in Figure 36.

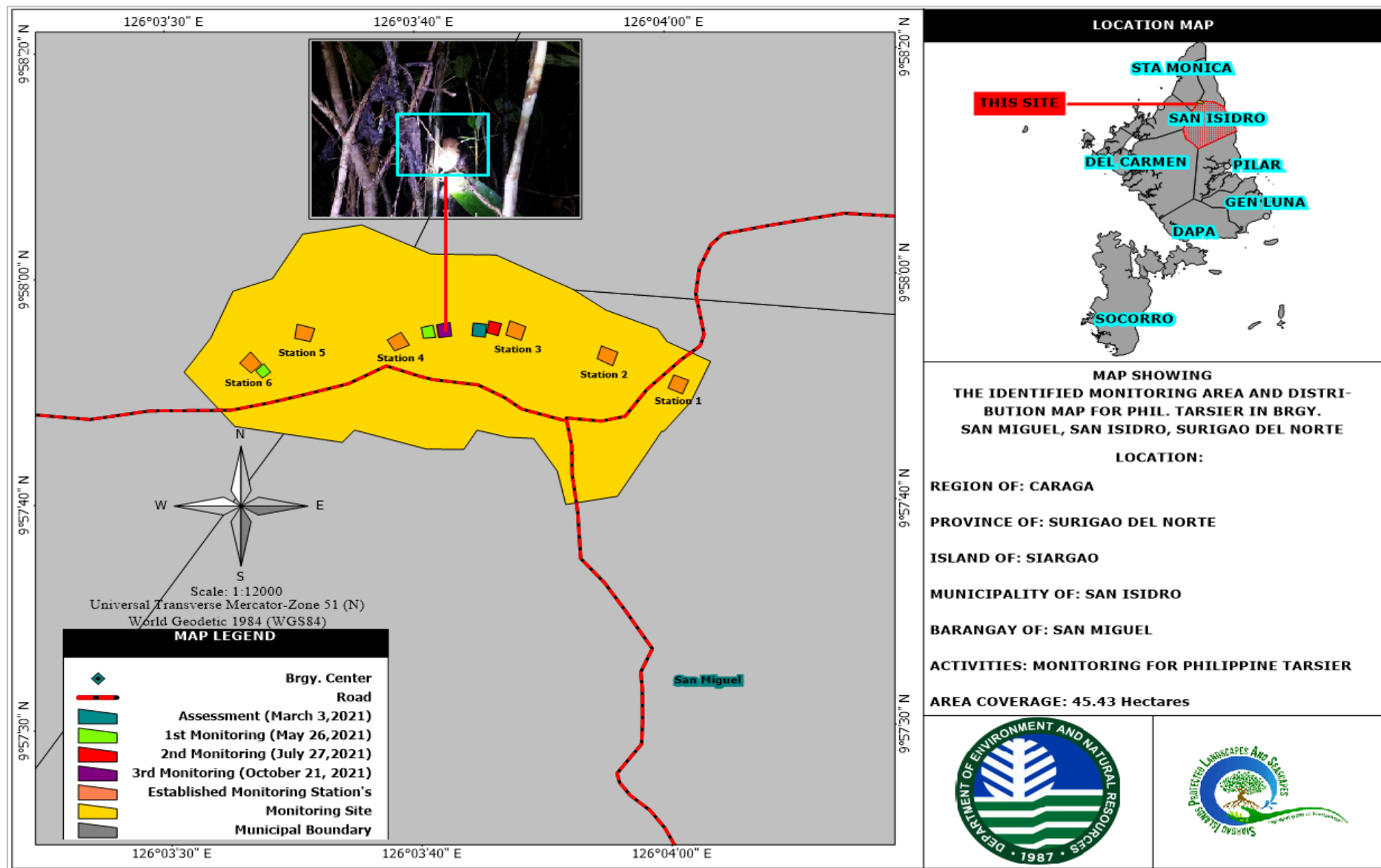


Figure 35. Geographical location of the spotted Philippine Tarsier at Barangay San Miguel, San Isidro, Surigao del Norte.

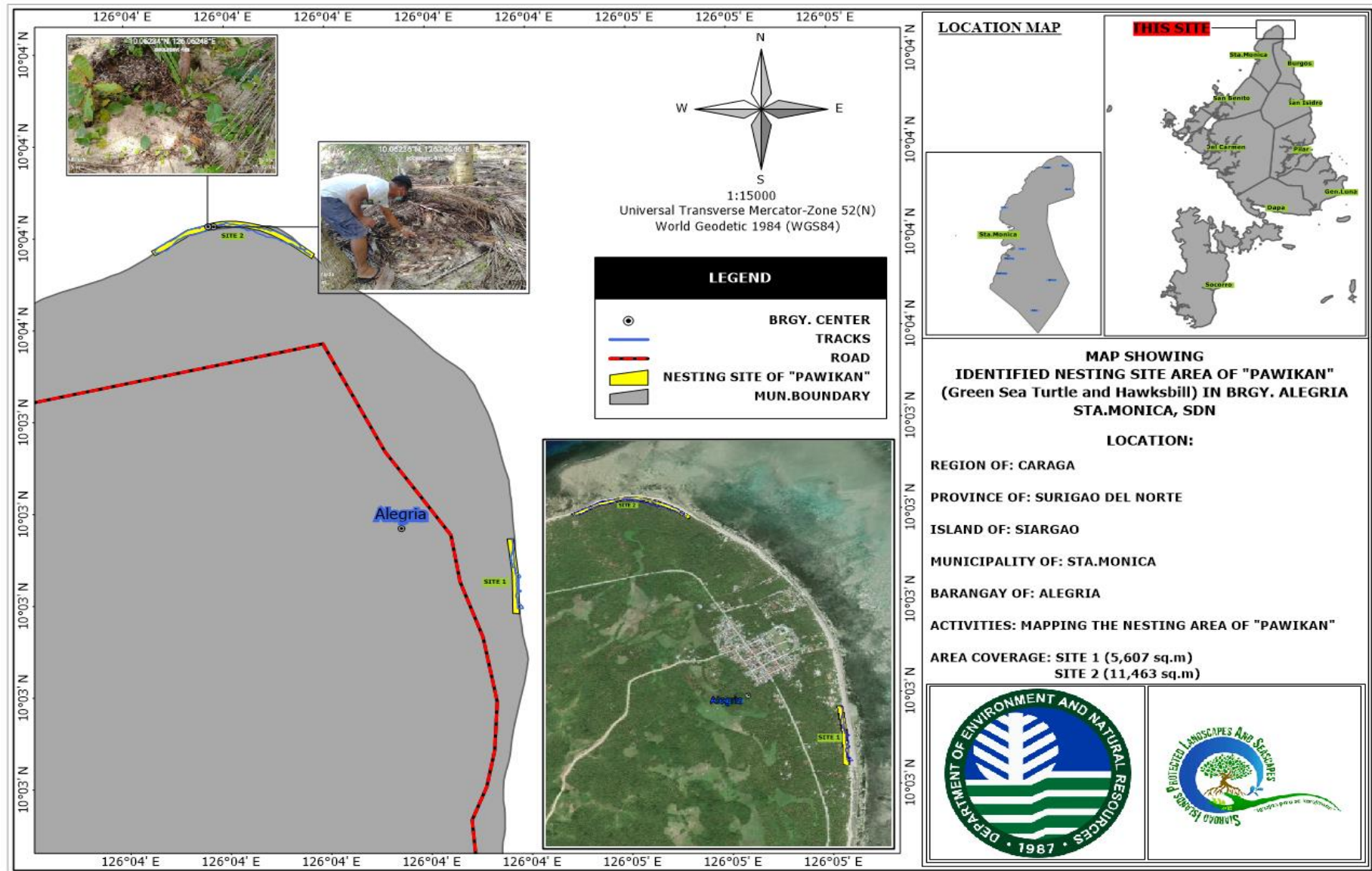


Figure 36. Geographical location of Sea Turtle nesting site at Barangay Alegria, Sta. Monica, Surigao del Norte.

3.2 Map on Values

This refers to the location of various current and potential uses/ecosystem services such as water sources, fishing area, presence of the environment and viewscapes for recreation and disaster risk reduction and their relative values in SIPLAS.

Provisioning, regulating, cultural, and social values can all be found on a map of values presented in Figure 37. The following categories refers, to wit:

- Provisioning refers to the services that the ecosystem provides to communities, such as food, water, raw materials or shelter and medicinal resources. In SIPLAS, majority of the communities rely on the protected area's resources of which there are 92 coastal barangays where fishing is the primary source of food and livelihood. In addition, all ecosystem in SIPLAS provide the conditions for growing, collecting or harvesting food. As for watershed, there are eleven (11) delineated watershed that helps in conservation of indigenous trees and water reservoir in SIPLAS that is shown in Figure 39. For raw materials, this exemplified on the vast agricultural area of SIPLAS of which the Jaboy Ecotourism and Conservation Organization (JECO), Inc. one of the recognized people's organization in SIPLAS used coconut hull to make jewellerys as one of the income of their organization. In terms of medicinal resources, SIPLAS is one of the diverse protected area in the country and its available resources are not yet studied as its uses and importance.
- Regulating - coastal and terrestrial ecosystems are examples of ecosystems that often invisible and there mostly taken for granted on its values. SIPLAS has 221,178.77 hectares of marine habitats including seagrass ecosystems, mangrove ecosystems, coral reefs, and fishing zones and 62,796 hectares of terrestrial ecosystems which includes secondary forest, wetlands, watersheds and caves. Forest in SIPLAS influence rainfall and water availability in which plays an important role in regulating air quality by removing pollutants from the atmosphere, it regulates the global climate by storing greenhouse gases, it creates buffer against natural disasters through reducing the damage from floods, storms and landslides, it prevents soil erosion and ensure fertility through natural biological process such as nitrogen fixation and it helps in pollination of insects and wind pollinate plants which is essential for the development of fruits, vegetables and seeds. In addition, fisheries in SIPLAS are directly impact by water and air temperature through impacts in reproduction cycles, spatial ranges, disease risk and fish habitats such as coral reefs which are susceptible to temperature changes. Coastal waters of SIPLAS also support carbon sequestration and storage through maintaining the "Blue carbon sinks" which includes peatlands, mangrove forests, seagrass beds and other ocean vegetated ocean habitats as well as carbon sequestering products such as mollusc and seaweeds.
- Cultural/Recreational – the culture of municipalities in the island of Siargao and Bucas Grande that are predominantly reliant on protected area resources. Municipalities in Siargao conduct annual celebrations to recognize the benefits they receive from the environment which includes:

Municipalities	Festival	Date
Burgos	Kalamansi Festival	July 25-26
Dapa	Kinhason Festival	January 14-15

Municipalities	Festival	Date
Del Carmen	Bakhaw Festival	July 16
General Luna	Cabuntog Festival	September 21-22
Pilar	Liplipan Festival	October 9-10
San Benito	Bugsay Lajag Festival	March 20-21
San Isidro	Sani Festival	May 15
Sta. Monica	Sapao-sapao Festival	August 26-27
Socorro	Harog Festival	February 22

Similarly, most of the recreational areas which are known for its panoramic seascapes and landscapes are source of income for communities involved in tourism and as service provider. Annex 14 contains information about the different ecotourism destinations in SIPLAS.

- Social refers to the values that communities receive from physical and built landscapes such as roads, built-up areas, rivers, and lakes (Nahuelhual et.al, 2016). Residents of SIPLAS used a total of 145,863 kilometers of road network in 2021 and there are nineteen (19) rivers shown in Table 14 which serve as alternative water and food source of the local communities in SIPLAS. The built-up areas are located in the 132 barangays in SIPLAS which are characterized by the harmonious interaction of man and land and water while providing opportunities for public enjoyment through recreation, tourism and other economic activities.

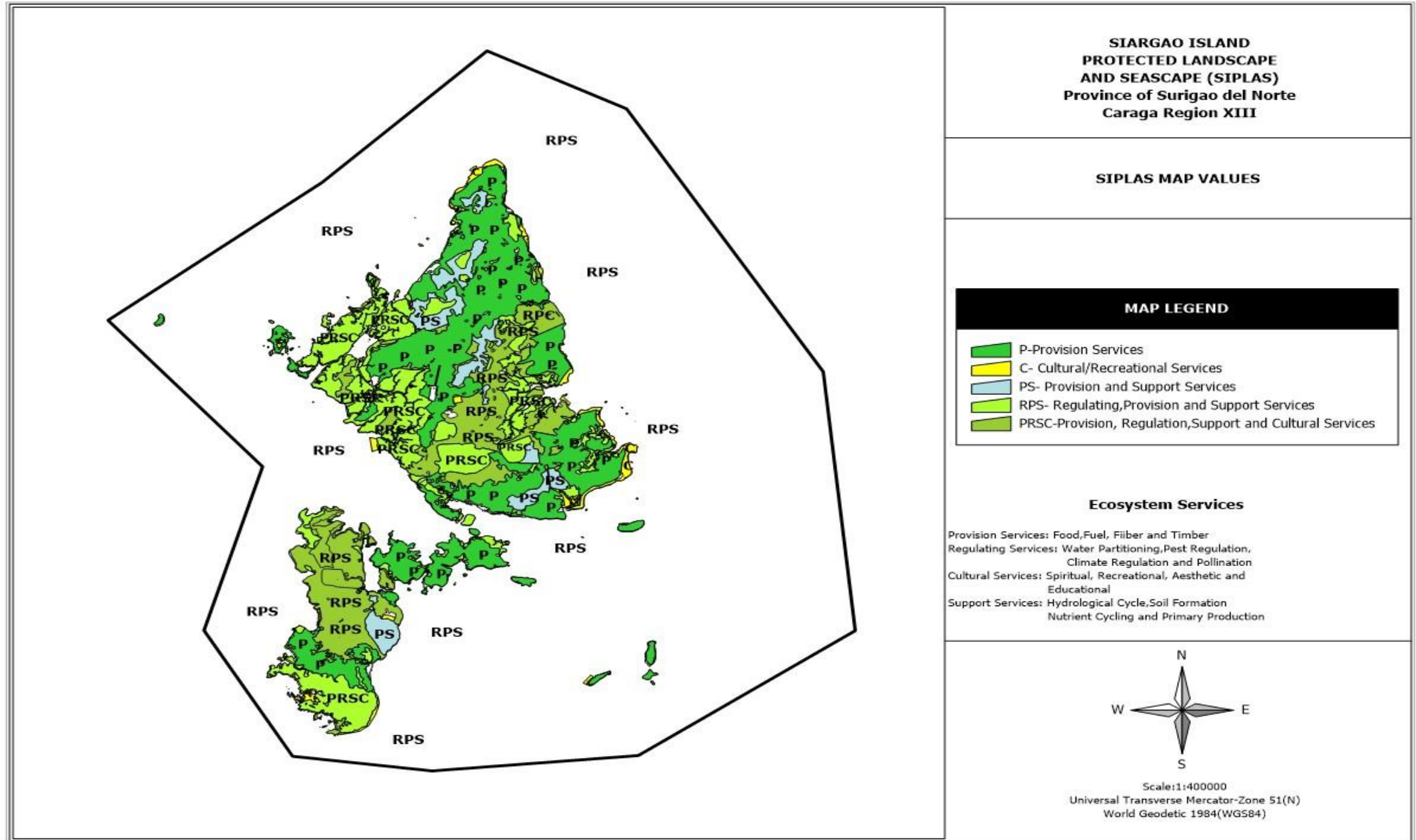


Figure 37. SIPLAS Value Map.

3.3 Map of Threats

Similarly, major threats in the protected area was also assessed and monitored to gather a reliable data this was also support through the conduct of SIPLAS MEA-METT. SIPLAS biodiversity threats map as presented in Figure 37 includes the following data:

- ✓ Quarrying and Reclamations;
- ✓ Housing and Settlements;
- ✓ Household sewage and urban waste water;
- ✓ Garbage and Solid Wastes;
- ✓ Seagrass Threats Focused Monitoring;
- ✓ Mangrove Threats Focused Monitoring;
- ✓ Fecal coliform content in recreational waters in SIPLAS

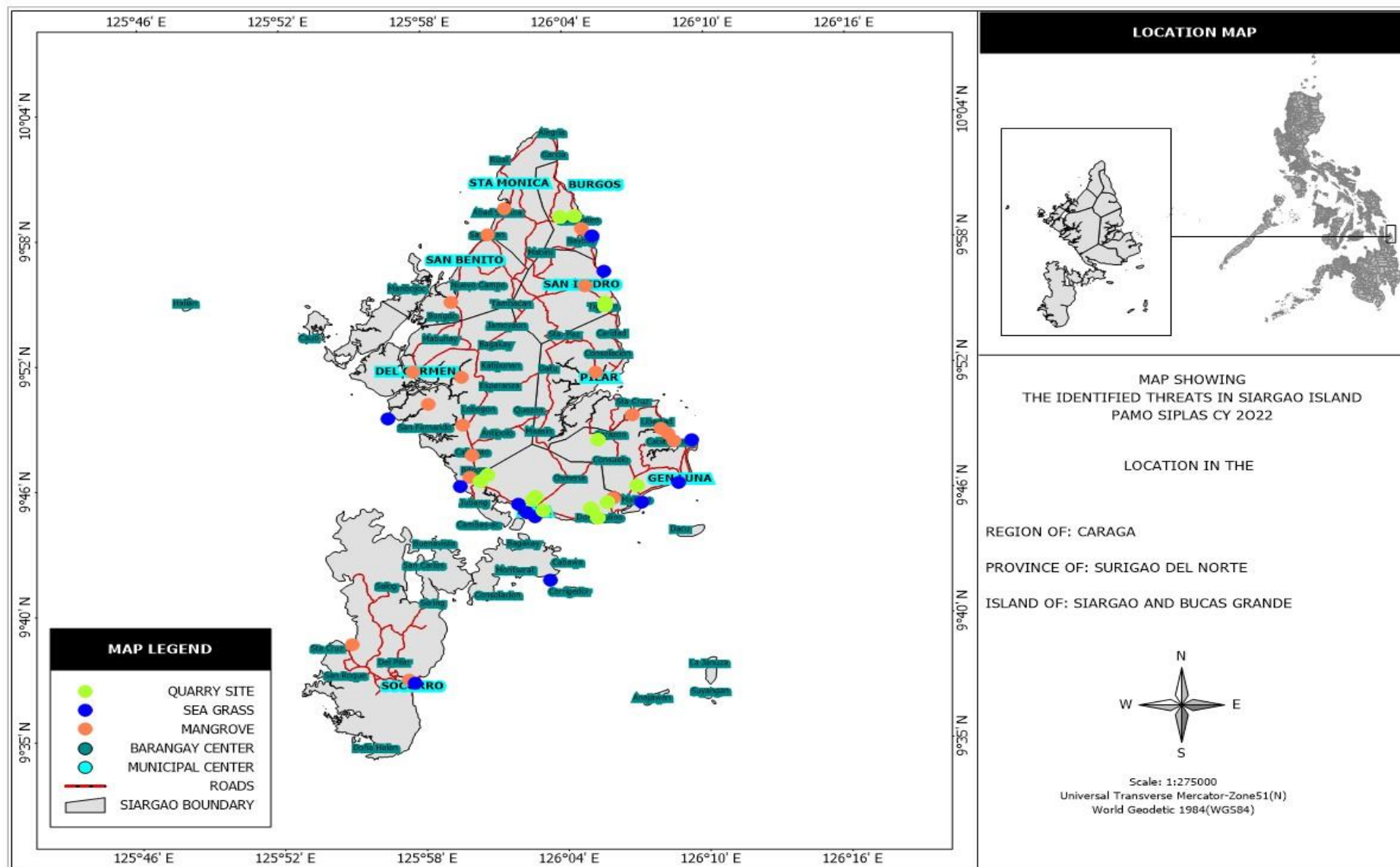


Figure 37. SIPLAS Threats Map.

IV. SITUATIONAL ANALYSIS: DEVELOPMENT AND MANAGEMENT ISSUES, CHALLENGES AND OPPORTUNITIES

4.1 Bio-physical Issues and Concerns

Current Issues and Concerns

▪ Watershed Degradation

Based on BAMS report CY 2018, the watershed in SIPLAS is degraded and this could be due, but not limited, to unchecked illegal activities, such timber poaching and charcoal-making, within the area.

Based on the results of the watershed delineation process, the boundaries of SIPLAS watershed has not only been defined but also eleven (11) subwatersheds have also been identified. With this regard, the SIPLAS watershed can be expected to be managed better, i.e., by involving the local government units and agencies where the sub-watersheds belong in the planning and formulation of watershed/sub-watershed management plan. This will also ensure that the management initiatives of the respective subwatersheds by the concerned local government units and agencies will be effectively implemented. The management and condition of the whole SIPLAS watershed is not only crucial in the overall health of the ecosystems but also in the socio-economic situations of the locality (DENR-FM, n.d.). Figure 39 presents the eleven (11) sub-watershed in SIPLAS.

Signs of disturbance include timber poaching, widespread tree cutting for housing, fuelwood, clearing and minimal kaingin for agricultural purposes, timber cutting for charcoal making, and small scale quarrying. The ironwood (*mancono*) in particular has become scarce as a result of uncontrolled and excessive harvesting. These are some of the environmentally-detrimental activities observed in SIPLAS as shown in Figure 37. Figure 38 shows the location of quarry sites in SIPLAS. The Table 53 provides information on the apprehended products of SIPLAS PAMO formerly CENRO Dapa from CY 2015-2020.



Figure 39. Images of some illegal human activities inside the forest in SIPLAS based on BAMS report CY 2018

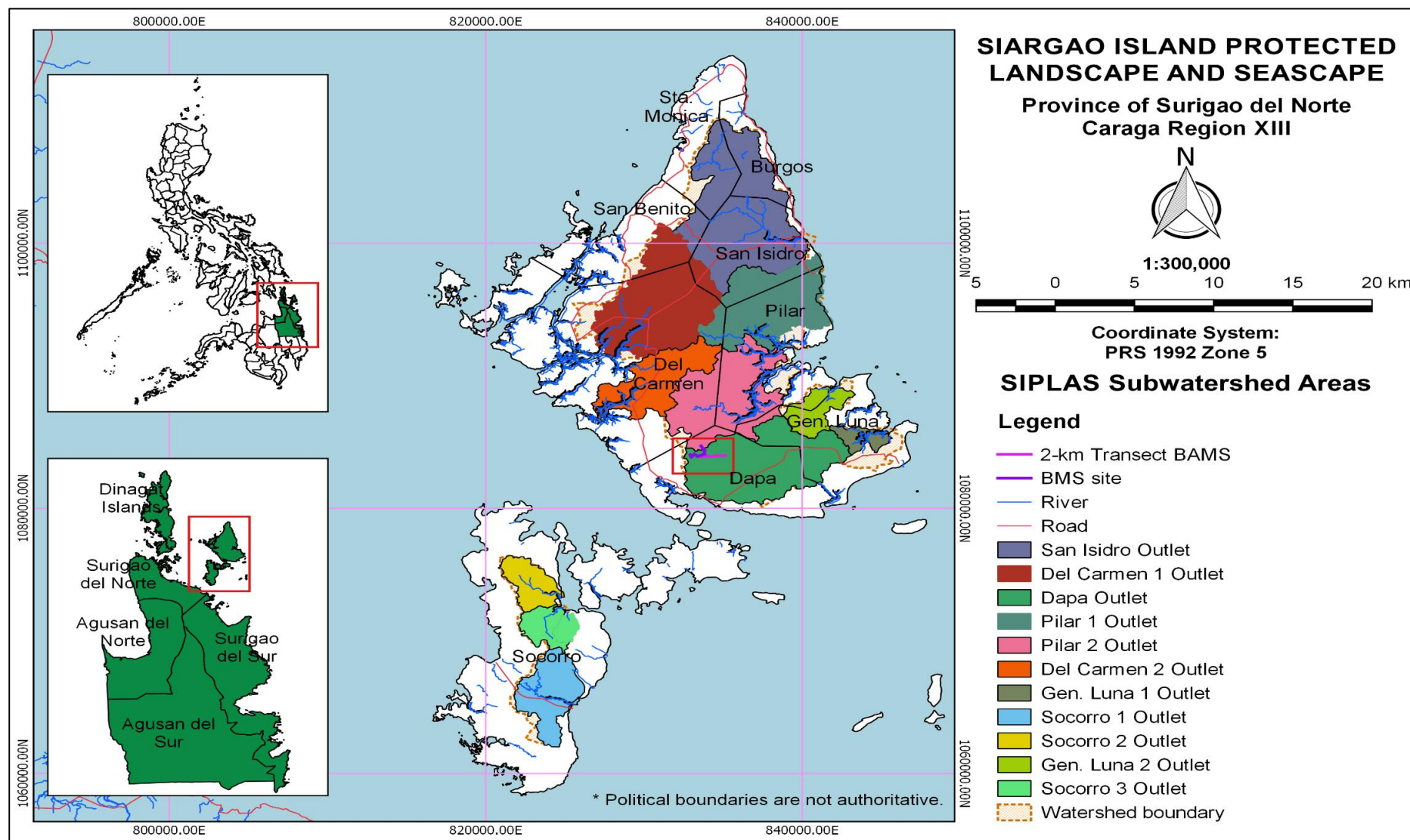


Figure 41. Sub-watershed areas inside SIPLAS watersheds, Siargao Island, SDN

Source: BAMS Report, CY 2018

Table 53. Yearly data on SIPLAS apprehended products

Year	No. of Volume	No. of Conveyances	Type of Conveyances	No. of Filed Cases	Types of Forest Products	Species	Status (No. of Volume)
2015	557.34	0		0	Sawn Lumber	Antipolo, Doyok-Doyok	Deteriorated: 421.33
2016	1,041.12				Sawn Lumber and Round Post	Banay-banay, Doyok-doyok, Lauan, Banabat and Molave	Deteriorated: 2,229.07
2017	12,000.00				Sawn Lumber, Furniture (4 bench)	Banay-banay, Mancono,	Deteriorated: 1,020
2018	17,703.25	Nine (9)	Pumpboat Boat Motorcycle with sidecar Motorboat Motorcycle		Sawn Lumber, Firewood, round timber and miscellaneous species, Furniture	Red and White Lauan, Antipolo, Doyok-doyok, Yakal, Bagotalisay, Dug-an, Tega	Undergone Administrative proceedings
2019	2,108.75		6-wheeler Dumptruck		Sawn Lumber	Doyo-doyok, Lauan, Dog-an, Bungliw and Hindang	

Source: SIPLAS PAMO, CY 2020

- Declining Mangrove Cover

Based on the SIPLAS PAMO mangrove monitoring CY 2021, anthropogenic threats were identified during the assessment in the mangrove habitat in SIPLAS which include: 1) infrastructure along the mangrove area such as settlements, road or trails, boardwalk or port, school building, and abandoned fish pond; 2) coastal developments such as reclamation in mangrove areas undertaken mostly by Local Government Units as presented in Table 54; 3) solid waste composed of plastics wraps, tin cans, sacks, fabrics, empty bottles, fishing nets and diapers were commonly observed; 4) docking area of which affect the mangrove habitat by preventing the growth of the mangrove seedlings brought about by constant disturbance coastal areas with docking structures are presented in Table 55; and 5) illegal cutting of mangrove trees particularly Tabao (*Lumnitzera littorea*) was observed in Brgy. Cabitoonan, General Luna. Figure 40 shows the map of the identified threats in mangrove area CY 2021.

Table 54. List of identified coastal barangay with reclamation activities and its area of coverage.

Municipality	Coastal Barangay	Coverage of reclaimed mangrove area for coastal development (m ²)
Dapa	Don Paulino	4,418
	Union	1,670
	Sta. Fe	5,497
San Benito	San Juan	1,818
Sta. Monica	T-Arlan	1,394
General Luna	Catangnan	936
San Isidro	Del Carmen (Pob.)	2,245

Source: SIPLAS PAMO Mangrove monitoring threat focus CY 2021

Table 55. List of identified coastal barangay with docking area and its area of coverage

Municipality	Coastal Barangay	Coverage of docking area (m ²)
Del Carmen	Del Carmen	17,400
	Bitoon	1,251
	Esperanza	1,168
	Cabugao	2,105
	San Jose	10,700
Sta. Monica	Magsaysay	2,608
	T-Arlan	7,164
Pilar	Pilaring	4,118

Source: SIPLAS PAMO Mangrove monitoring threat focus CY 2021

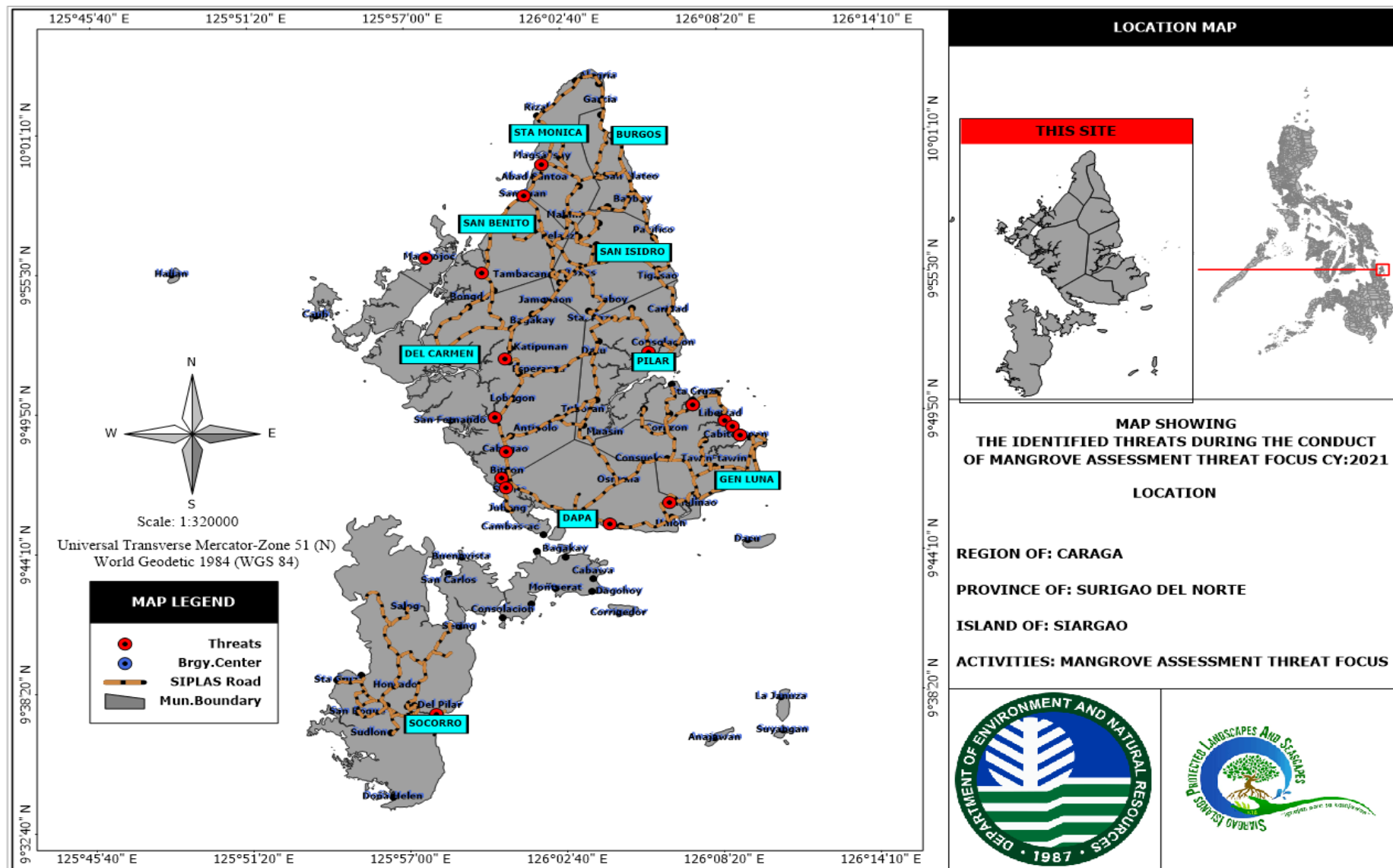


Figure 42. Location of mangrove areas with recorded threats, CY 2021.

Souce: SIPLAS PAMO Mangrove Forest Monitoring: Threat Focused, CY 2021

Based on the available mangrove inventory in CY 2020 as shown in Table 56, seven (7) out of nine (9) municipalities increased its mangrove cover. General Luna has a noticeable increase of 528.6 hectares from CY 2011 to CY 2020 followed by San Benito with 469.2 hectares.

The declining mangrove forest cover is one of the most visible concerns in SIPLAS. Some municipalities in SIPLAS convert its mangrove habitats to other uses, such as settlements and land developments which has resulted in mangrove denudation.

Several initiatives and interventions were made by different agencies and organizations from intensive CEPA to mangrove tree planting to address the decreasing mangrove cover in SIPLAS. The DENR through the SIPLAS PAMO had implemented programs to address the problem such as Mangrove and Beach Forest Development Program (MBFDP) and National Greening Program (NGP).

It is worth noting that the differences in mangrove cover presented in Table 56 maybe because of the use of different model sources. The 1988 mangrove cover is based on the model generated on the satellite images, same with 2020 mangrove cover that the DENR CDD XII generated.

Table 56. Mangrove Cover Change in SIPLAS

Municipality	Mangrove cover (hectares)		
	1988*	2011**	2020***
Burgos	na	na	0.125
Dapa	619.1	698.9	774
Del Carmen	5,547.55	4,295.00	4,478
General Luna	405.29	111.4	640
Pilar	1,786.16	1,216.80	1,406
San Isidro	no data	160.4	27
Sta Monica	no data	81.1	74
San Benito	1,421.12	1,009.80	1,479
Socorro	no data	195.2	492
Total	9,779.20	7,768.60	9,370.125

Source: *DENR Land Cover Map (based on 1988 spot satellite image); **Natural Resource Accounting 2011; ***DENR SIPLAS PAMO Mangrove Assessment CY 2020

▪ Illegal Fishing and Overfishing

Illegal fishing and overfishing are two other pressing issues that must be addressed in the area as compressor fishing is still practiced in some of the area particularly in established Marine Sanctuaries. The use of noxious substances that is practiced by both local and migrant fishermen, is destroying some coral reefs. Poaching by commercial fishing boats, known locally as *liba-liba*, and “superlight” trawls had contributed to the further degradation of reef habitat. Overfishing is also blamed for artisan fishermen's poor catch. There have been reports of illegal egg collection and slaughter of adult sea turtles in SIPLAS.

Since CY 2017, Marine Protected Area patrolling was conducted by SIPLAS PAMO quarterly and the consolidated data of illegal fishing within the marine protected area (MPA) is presented in Table 57.

Table 57. Consolidated data of recorded illegal fishing within the MPA

YEAR	Quarterly recordings of MPAs with reported illegal fishing			
	Q1	Q2	Q3	Q4
2017	No Data	No Data	2 (Burgos MPA and Caub MPA)	1 (Socorro MPA)
2018	2 (Pamosaingan MPA and Lakyajon MPA)	1 (Lakyajon MPA)	2 (Pamosaingan MPA and Corregidor MPA)	4 (T-Arlan MPA, Lakyajon MPA, Corregidor MPA, and Pilar MPA)
2019	3 (Pilar MPA, Lakyajon MPA, & Corregidor MPA)	4 (Pamosaingan MPA, Pilar MPA, Caub MPA & Lakyajon MPA)	No Data	No Data
2020	No Data	No Data	3 (Tigasao MPA, Corregidor MPA, & Caub MPA)	3 (Pilar MPA, Caub MPA, & Corregidor MPA)
2021	5 (Caub MPA, Corregidor MPA, Pilar MPA, Pamosaingan MPA, & Lakyajon MPA)	5 (Caub MPA, Corregidor MPA, Pilar MPA, Pamosaingan MPA, & Lakyajon MPA)	5 (Caub MPA, Corregidor MPA, Pilar MPA, Pamosaingan MPA, & T-Arlan MPA)	5 (Caub MPA, Corregidor MPA, Daku MPA, T-Arlan MPA, & Pilar MPA)

Source: MPA Monitoring Report CY 2017 to CY 2021.

▪ Improve Ecological Solid Waste Management

One of the pressing issue in SIPLAS is on ecological solid waste management. Considering that Siargao Island is one of the top eco-destination internationally, the sudden influx of the number of tourist visiting the island and the drastic increase of resorts and recreational establishments inflict pressure in the environment particularly in their solid and water wastes. Currently, no sewage treatment plant existing in SIPLAS which is necessary in cleaning waste water or discharge thereby protecting the environment.

During the seagrass monitoring threat focused CY 2021, one of the major issue identified is the solid waste wherein many debris or pollutants such as plastic bottles, sachets, tin foils, clothes, sacks, plastic wrappers and tin cans are commonly observed along the coastline as well as scattered along the waters and beach area. It was also observed that the waste water from the public market is being drained to the coastal waters which makes the seagrass area slightly turbid. Solid wastes are observed in the coastal areas of Barangay Poblacion 6 and Poblacion 13 in Dapa, Brgy. Asinan of Pilar, Brgy. Talisay of San Benito, and Brgy. Rizal of Socorro. Figure 41 shows the location of seagrasses threats based on the seagrass monitoring CY 2021.

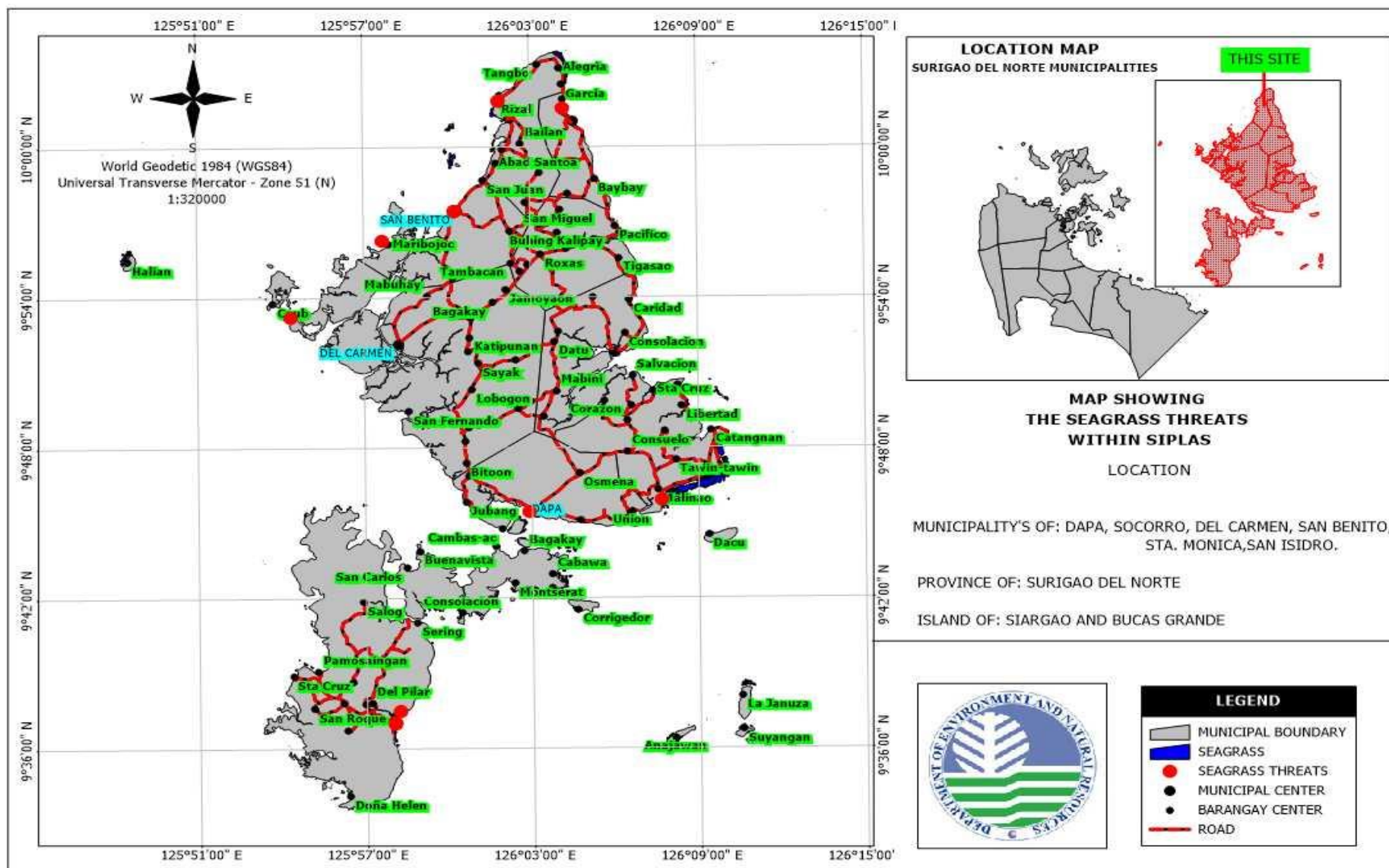


Figure 43. Location of seagrass areas with recorded threats, CY 2020 and CY 2021.

Source: SIPLAS PAMO Seagrass Monitoring: Threat Focused, CY 2021

Local Government Units in SIPLAS are continuously implementing ecological solid waste management programs such as '*Bugas sa basura*' of LGU General Luna and the establishment of Residual Containment Areas (RCA) by some LGUs as shown in Table 58. There are eight (8) operational Material Recovery Facility (MRF) in SIPLAS as presented in Table 59.

Table 58. Residual Containment Area status in nine (9) municipalities in SIPLAS

Municipality	RCA Status
Burgos	Not Operational
Dapa	Operational
Del Carmen	Not Operational
General Luna	Operational
Pilar	Operational
San Isidro	Not Operational
Sta Monica	Not Operational
San Benito	Operational
Socorro	Not Operational

Source: EMB Region 13 CY 2021

Table 59. Material Recovery Facility status in nine (9) municipalities in SIPLAS

Municipality	RCA Status
Burgos	Operational
Dapa	Not Operational
Del Carmen	Operational
General Luna	Operational
Pilar	Operational
San Isidro	Operational
Sta Monica	Operational
San Benito	Operational
Socorro	Not Operational

Source: EMB Region 13 CY 2021

- Strengthening Enforcement Initiatives

Likewise, these issues are further triggered due to weak implementation of related environmental laws and policies. These weaknesses in protected area management include poor enforcement on local environmental legislations or ordinances and laws on easements, fishery, forestry, and solid wastes. Particularly land-use conversion issue is of great concern considering that most of the agricultural areas are now utilized as residential-commercial areas.

To assess the compliance of the existing establishments and developments within the nine (9) municipalities in SIPLAS to environmental laws, rules and regulations, the Task Force Siargao was created. Threats that has been addressed by Task Force Siargao includes easement, solid waste management, waste water management, compliance to 10-m maximum building height per DAO 2009-09, and Environmental Compliance Certificate.

- Low Participation of Community in SIPLAS Management

The lack of the local community's determination in participating different activities related to environmental conservation and protection. This is manifested through low support in implementing conservation and protection activities from the barangay local government down to the local communities in general. Thus, conservation management strategies such as intensive Communication, Education, and Public Awareness (CEPA) campaign programs to educate and encourage more people especially the locals of SIPLAS to involved themselves in our conservation initiatives (SIPLAS Communication Plan CY 2019).

- Low Generation of Revenue

The generation of revenue for the national government is low, hence invoking to regulate the collection of SIPLAS Integrated Protected Area Fund (IPAF) for the operationalization of the protected area. THE SIPLAS PAMB and PAMO are to find ways to improve SIPLAS' revenue generation activities to support the activities described in the plan, particularly potential revenues from environmental services payments, permit fees and penalties.

- Water Pollution

Water pollution from agricultural and inappropriate waste disposal procedures is one issue that should be investigated. Fertilizer use in agriculture may raise the risk of groundwater contamination and contamination of surrounding bodies of water.

With the area's thriving tourism business, population areas are expanding and business and tourism facilities are proliferating along the shoreline. Due to their vulnerability to a variety of climate hazards, the majority of these places are classified as high risk. In SIPLAS, rising population and settlement growth also pose solid waste and wastewater issues, contributing to the degradation of water sources and degradation of coastal habitats. In the Siargao Islands, it is critical to promote effective solid waste and wastewater management techniques as well as the establishment of adequate facilities.

BAMS CY 2018 measured the water quality parameters as shown in Table 51, data show that in general, the rivers and their water are still in good quality. They can be utilized for industrial, tourism, and recreation purposes. However, sustainable utilization of the river resources should be guaranteed. Pollutants must not find their way into the river ecosystems. Plastics and nonbiodegradable materials must be prevented from contaminating the river ecosystems. Strict implementation of ecological solid waste management programs of each concerned governing body must be promoted and supported by all stakeholders.

- Quarrying and Reclamation

Provided that SIPLAS is a protected area, commercial or large-scale quarrying within the protected area is strictly prohibited, as provided in Section 20-q of R.A. 11038. However, Provincial Local Government Unit's (PLGUs) specified in their Comprehensive Tourism Master Plan (CTMP) the need of quarry in SIPLAS for domestic use. The PAMB by virtue of PAMB resolution 2021-122, the DENR, MGB, LGU's and PAMB are requested to conduct joint and one-time assessment on the proposed quarry areas located within the Multiple Use Zone (MUZ) particularly the ordinary earth soil for embankment.

Coastal development is often observed in some urban and industrialized cities. Reclamation in coastal areas is carried out to cater establishments and infrastructure projects. In Siargao, in spite of being a protected area, embankment in seagrass area can still be observed undertaken mostly by Local Government Units. Others were facilitated by individuals being the owner or claimant of the adjacent area. In fact, a reclamation had been observed in Dapa specifically for the expansion of the boulevard wherein an on-going filling of land in the intertidal zone was observed during the seagrass sampling and monitoring as reported in Seagrass CY 2021 threat focused monitoring. A total of 360 m² of the coastal waters has been filled in as of February 26, 2021. This threat was not observed during the CY 2020 seagrass monitoring.

- Lack of livelihood alternatives

The common livelihood in SIPLAS is agriculture and income derived from other industries, service-based industry and fisheries. Only in the municipality of General Luna, Dapa, and Del Carmen that the majority of the community derived their income as ecotourism service provider. The least common livelihood is livestock and poultry given that SIPLAS is an ecotourism site, some LGU's prohibit the raising of livestock specifically near the beach area and river banks.

- Easement/ECC issuance

Pursuant to Republic Act No. 11038, otherwise known as the "Expanded National Integrated Protected Areas System Act of 2018," set forth the creation of a Protected Area Management Board (PAMB) and one of the functions of the Protected Area Management Board is to oversee the management of the protected area, and to approve policies, plans and programs, proposals, agreements, and other related documents for the management of the protected areas. Section 12 of R.A. 11038 provides that: "No project or activity shall be undertaken by any project proponent without prior clearance from the PAMB. The DENR shall require the submission of the PAMB clearance, among others, before issuing an ECC to a project proponent and that no actual implementation of such activities shall be allowed without the required ECC under the Philippine EIA System".

The PAMB clearance shall include an endorsement for the EMB Regional Office to determine whether the development project or activity is eligible for a Certificate of Non-Coverage (CNC), or should undergo the scoping process under EIS System.

Relatively, one of the functions of the PAMB is to ensure the implementation of the national law such the Water Code of the Philippines. Given that SIPLAS is an island protected area and one of the ecotourism sites in the Philippines, the PAMB need to ensure that the community has equal rights to access clean water is truly fulfilled.

- Low collection of revenue in facilities of the government involving the IPAF regulation for the operationalization of the protected area

Fees are collected from PAMB endorsement and inspection, PAMB clearance, permit to operate, PAMB certification, penalty for constructing without PAMB clearance, and resource user's fee through MOA. These fees make some contribution to SIPLAS management and its environment. However, it is not enough to support the management needs of SIPLAS particularly in protection and conservation aspect.

The PAMO-SIPLAS had established Integrated Protected Area Fund (IPAF) since 2015 whereby all revenues generated by the protected area were deposited and maintained by DENR and the PAMB. Since its opening of account until June 2021, the IPAF collection reached Php 5,756,425.30 with Php 4,925,858.85 deposited in the Retention Income Account of SIPLAS and Php 830,566.45 deposited in the Central IPAF under the Sub-Allotment to the General Fund of the Bureau of Treasury. However, due to the pandemic the collection lessened since the main source of collection is from the operation of tourist establishments/developments as shown in Figure 42.

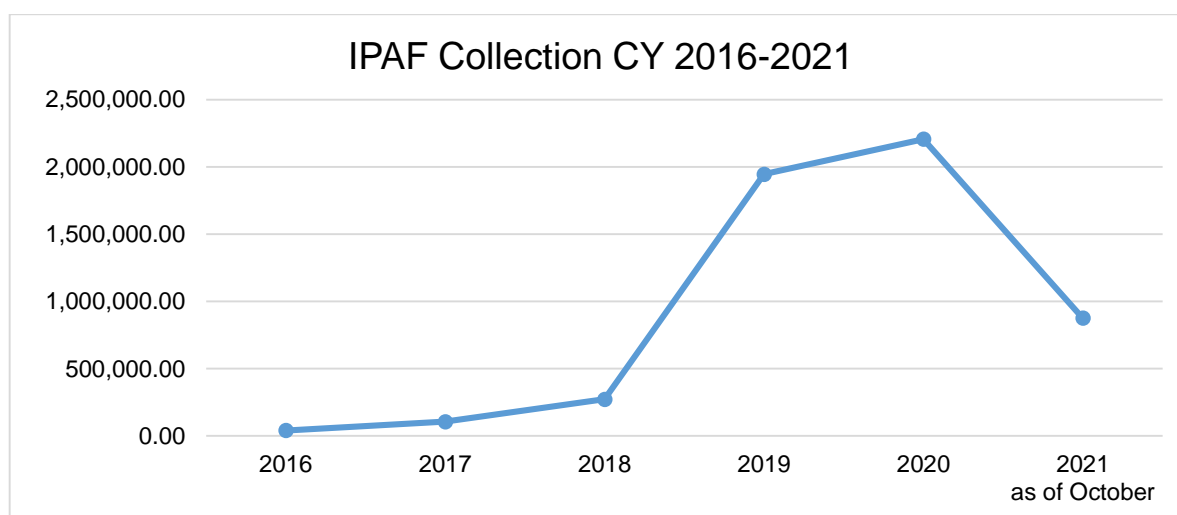


Figure 44. SIPLAS IPAF Collection from CY 2016 to CY 2021.

Source: SIPLAS PAMO CY 2021

- Fecal coliform content in recreational waters in SIPLAS

Based on the data provided by Environmental Management Bureau (EMB) Region 13 for the 3rd quarter of CY 2021 water quality assessment under MUZ within recreational waters, there are seven (7) locations in Dapa that failed to pass the total coliform standards and two (2) of them are specifically located in the Coastal Waters of Brgy Union Boulevard and Sand Beaches fronting Cumahig Beach House both are in Barangay Union, Dapa, Surigao del Norte as shown in Table 60. It is worth noting that these areas have many houses or settlements built inside and adjacent to its coastal waters.

In SIPLAS, coastal development has occurred, frequently, without proper planning and consideration to natural habitat environments. It causes loss of semi-natural and natural land, destruction and fragmentation of coastal habitats, and is also related to increased discharge of diffuse pollution and marine litter to the marine environment.

Table 60. Results of water quality in SIPLAS

Municipality	Sampling Stations	No. of sampling stations	Remarks
Burgos	RZ	1	Passed in all parameters
	RO	1	Failed in turbidity, fecal coliform and chloride
	SPZ	1	Failed in total coliform and color
Dapa	RZ	7	Failed in fecal coliform
	RO	2	Failed in total dissolved solids, fecal coliform and chloride
	SPZ	1	Failed in total coliform
Del Carmen	RZ	6	Passed in all parameters
	SPZ	1	Failed in total coliform
General Luna	RZ	18	Passed in all parameters
	RO	1	Failed in total dissolved solids and chloride
	SPZ	1	Failed in total coliform
Pilar	RZ	4	Passed in all parameters
	RO	1	Failed in salinity, total dissolved solids and chloride
	SPZ	1	Failed in total coliform and fecal coliform
San Benito	RZ	1	Passed in all parameters
	RO	1	Failed in salinity and fecal coliform
	SPZ	2	Failed in total coliform, fecal coliform and color
San Isidro	RZ	3	Passed in all parameters
	RO	2	Failed in fecal coliform and chloride
	SPZ	1	Failed in total coliform
Socorro	RZ	4	Passed in all parameters
	RO	1	Failed in chloride
	SPZ	1	Failed in conductivity, total coliform and fecal coliform
Sta. Monica	RZ	3	Failed in pH and temperature
	RO	2	Failed in fecal coliform and chloride
	SPZ	1	Failed in total coliform and fecal coliform

Legend: RZ – Recreational Zone, RO -River Outlet, SPZ/MPA-Strict Protection Zone /Marine Protected Area

Source: SIPLAS PAMO 3rd Quarter Water Quality Report, CY 2021

4.2 Climate Change Issues and Concerns

SIPLAS is more vulnerable to the effects of climate change because it is an island ecosystem. This section discusses the findings of vulnerability assessments for terrestrial, coastal, and marine ecosystems.

4.2.1 Vulnerability of Terrestrial Ecosystems

The Intergovernmental Panel on Climate Change (IPCC) framework for assessing vulnerability to climate change hazards takes three (3) factors into account: exposure to climate hazards, sensitivity of exposed elements to the hazard, and adaptive capacity to cope with the hazard as shown in Figure 43.

SIPLAS' sustainability is threatened by climate change due to human activities. Climate change hazards such as rising ambient and sea surface temperatures, irregular rainfall patterns, sea level rise, and more intense extreme climatic events such as typhoons, floods, and droughts, including storm surges, are projected to increase over time. This will have an impact in SIPLAS, not only on the community but also on the economy. Increase in precipitation and temperature, as well as sea level rise and storm surges, are also predicted to reduce crop yield, posing health risks and causing damage to livelihoods such as farming, fishing, aquaculture, and commercial operations.

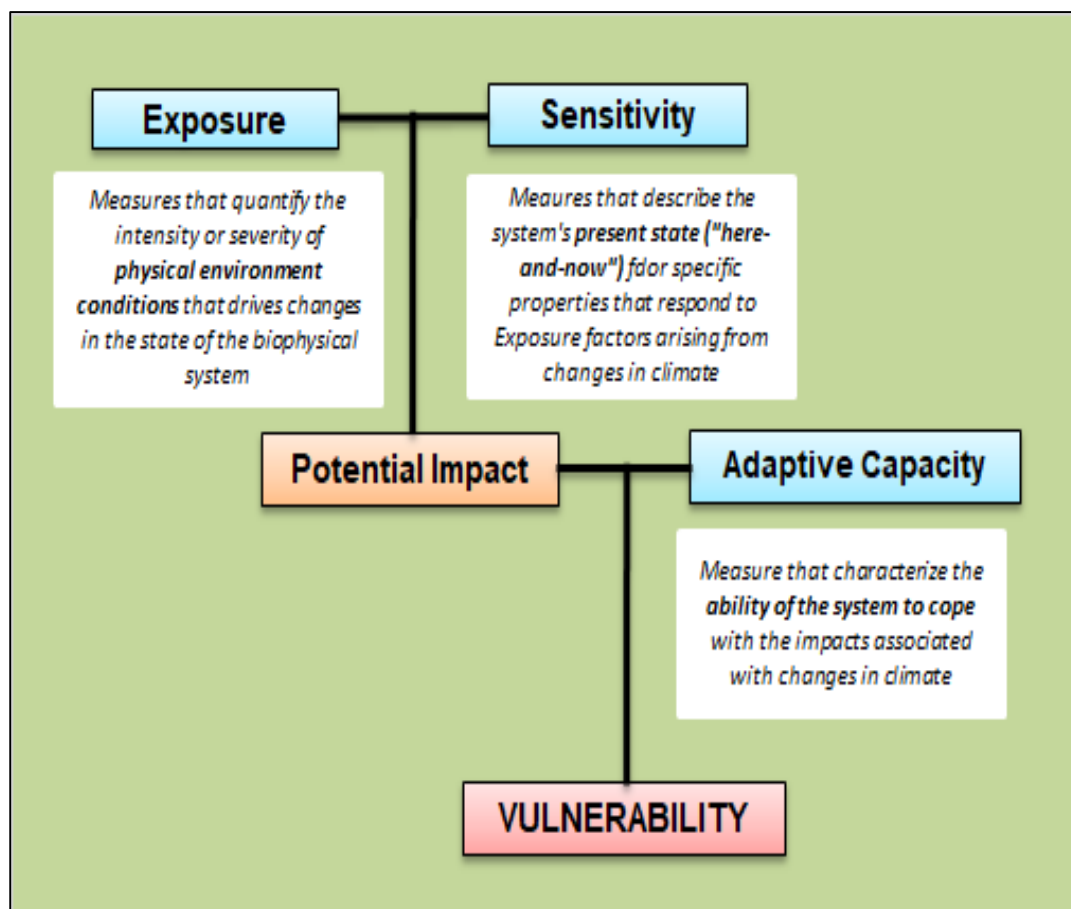


Figure 43. Framework of Vulnerability Assessment to Climate Change

Source: SIPLAS Management Plan CY 2015

The above methodology framework was used in the vulnerability assessment for SIPLAS' terrestrial ecosystem. The following are the assessment's major findings:

- ❖ **An increase in ambient temperature, specifically the monthly mean temperature, will be experienced, i.e., by about 1.0 °C in CY 2020 and rising to 1.5°C in CY 2050 (SIPLAS Management Plan CY 2015)**

This means that dry months will become drier and wet month wetter. This is based on climate change projections undertaken by DOST-PAGASA in CY 2011 for Surigao del Norte Province, including Siargao Islands as shown in Table 61.

Table 61. Observed (historical) and projected monthly mean temperature for CY 2020 and CY 2050 in Surigao del Norte

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Observed	28.4	26.3	26.7	27.6	28.4	28.4	28.1	28.3	28.2	27.7	27.1	26.6
2020	29.2	27.1	27.5	28.5	29.2	29.3	29.0	29.2	28.9	28.6	29.0	27.3
2050	29.8	27.7	28.3	29.4	30.1	30.4	30.0	30.2	29.9	29.4	28.7	28.1

Source: DOST PAGASA CY 2011; SIPLAS Management Plan CY 2015

- ❖ **Erratic rainfall patterns will be observed through time**

For the same period, i.e., CY 2020 to CY 2050, Table 62 shows rainfall projection for Surigao del Norte.

Table 62. Observed (historical) and projected monthly total rainfall (in mm.) for CY 2020 and CY 2050 in Surigao del Norte

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Observed	603.4	428.6	369.8	203.1	132.6	148.6	170.7	136.9	165.7	267.9	510.8	510.8
2020	736.8	481.2	438.9	169.8	125.3	195.8	187.8	160.8	201.5	235.5	606.0	562.7
2050	615.1	426.3	281.7	141.8	119.6	148.0	144.9	145.8	170.5	337.6	604.4	721.1

Source: DOST PAGASA CY 2011; SIPLAS Management Plan CY 2015

It should be noted that the estimated erratic rainfall pattern will affect the hydrologic characteristics of SIPLAS, particularly its water yield through time which is relative to rainfall events.

- ❖ **SIPLAS are vulnerable to flooding and rain-induced landslides**

Because of its low elevation, the majority of SIPLAS is vulnerable to flooding, as seen in Figure 44. San Isidro, San Benito, Del Carmen, Pilar, Dapa, and General Luna are the most affected areas as presented in Table 63. Swells and surges in estuaries and coastal areas are the main causes of flooding in SIPLAS see Table 64 for population exposed to storm surges. Floods usually extend upstream to the swamp areas and sometimes can last up to two weeks, particularly during the southwest and northeast monsoons (Ecotown Project CY 2012; SIPLAS Management Plan CY 2015).

Table 63. Areas Prone to Flooding and Landslides per municipality and Percentage of Population Affected

Municipality	Population 2015	TOTAL EXPOSED POPULATION		Rating
		Number	%	
1. Burgos	4,034	840.33	20.83	Low
2. Dapa	23,787	9550.16	40.15	Low
3. Del Carmen	18,392	10,279.88	55.89	Moderate
4. General Luna	16,771	9,361.22	55.82	Moderate
5. Pilar	9,752	6,300.00	64.60	High
6. San Benito	5,404	1,516.00	28.05	Low
7. San Isidro	7,325	3,839.00	52.41	Moderate
8. Sta. Monica	8,808	2,725.00	30.94	Low
9. Socorro	22,314	2,823.00	12.65	Very Low
Sub-Total	116,587	47,234.59		

Source: PDPFEP-SDN, CY 2017-2028

Table 64. Exposed Population: STORM SURGE

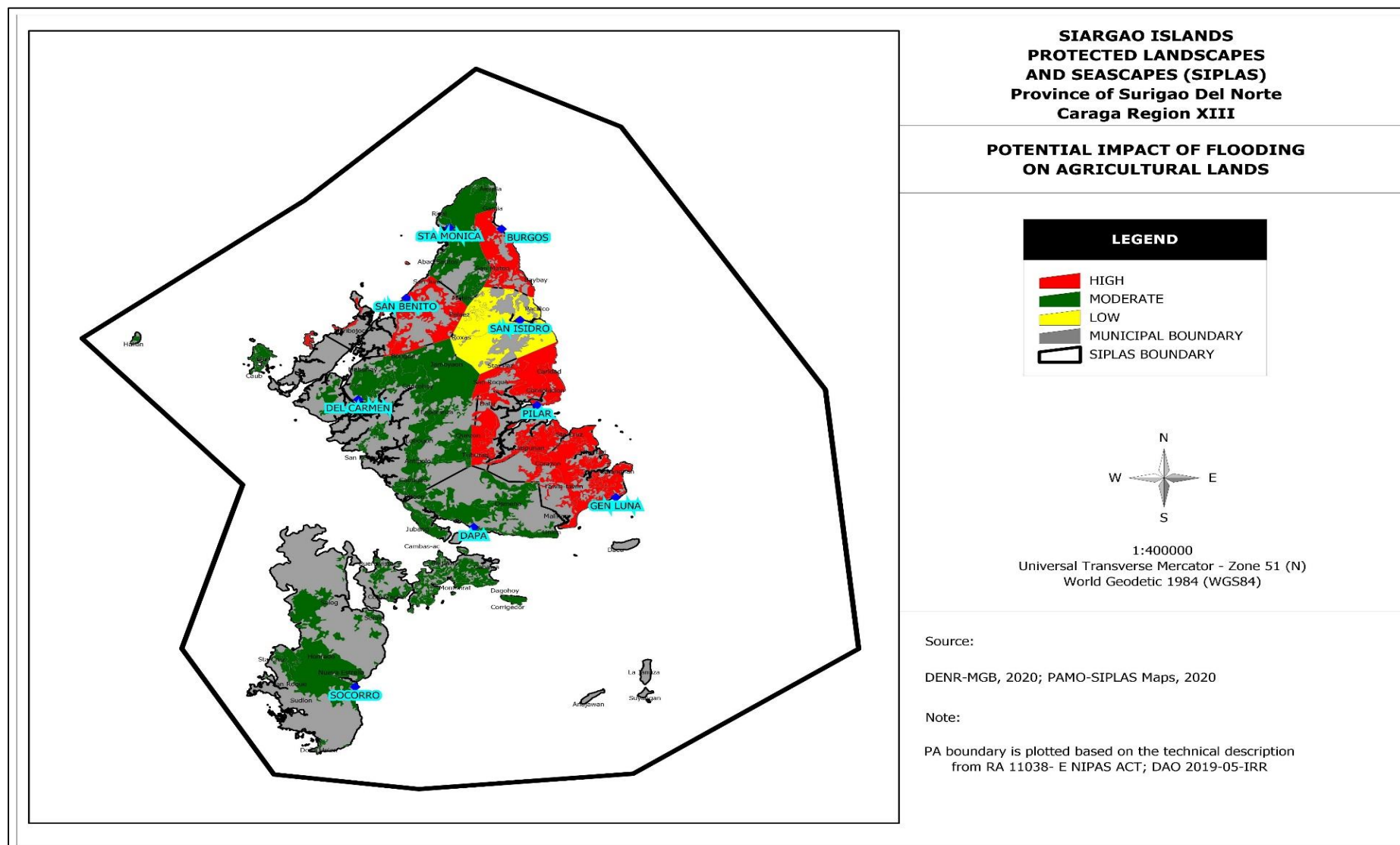
Municipality	Population 2015	TOTAL EXPOSED POPULATION		Rating
		Number	%	
1. Burgos	4,034	159.00	3.94	Very Low
2. Dapa	23,787	4,757.00	20.00	Very Low
3. Del Carmen	18,392	1,172.00	6.37	Very Low
4. General Luna	16,771	3,835.00	22.87	Low
5. Pilar	9,752	1,040.00	10.66	Very Low
6. San Benito	5,404	319.00	5.90	Very Low
7. San Isidro	7,325	74.00	1.01	Very Low
8. Sta. Monica	8,808	680.00	7.72	Very Low
9. Socorro	22,314	99.00	0.44	Very Low
Sub-Total	116,587	12,135.00		

Source: PDPFEP-SDN, CY 2017-2028

Figure 45 depicts the potential impact of flooding to agriculture in SIPLAS. More than 30% of its agricultural lands which is about 10,885 hectares are highly susceptible to flooding. These areas are mostly located in San Isidro, Del Carmen, Pilar, General Luna, and Dapa, affecting most of their rice lands. Based on a 50% loss in rice production due to flooding in at least 70% of the irrigated areas of the Siargao Islands, and an average rice production of 3.53 tons per hectare, the potential loss in rice production during floods is around 1,225 metric tons. This is a big setback for an area that imports the majority of its rice from the mainland provinces of Surigao. Apart from agriculture, flooding also affects settlements. Approximately 66% of the built-up areas in the nine (9) municipalities of SIPLAS covering 487 hectares are exposed to flooding which impact the lives and properties of local communities as shown in Figure 46.

The map of potential flooding impact on agriculture and settlements was overlaid with the adaptive capacity map of Siargao to determine the areas vulnerable to flooding. The average monthly household income in each municipality was used as a proxy indicator for the analysis of community adaptive capacity. The assumption is that communities with lower household income will be more vulnerable to the effects of flooding because they lack the capacity to cope with it. Figure 47 presented the map showing the lack of adaptive capacity of households in the municipalities of Siargao Islands.

Combining the map on lack of adaptive capacity (Figure 47) and the map on potential impacts of flooding on agriculture and settlements (Figure 45), the SIPLAS vulnerability map to flooding was generated as presented in Figure 48. As indicated in the map, the municipalities of Sta. Monica, San Benito, Del Carmen, Dapa, General Luna and Pilar are highly vulnerable to the flooding hazard. With more rains expected during the rainy season, problems associated with flooding will be aggravated.



Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

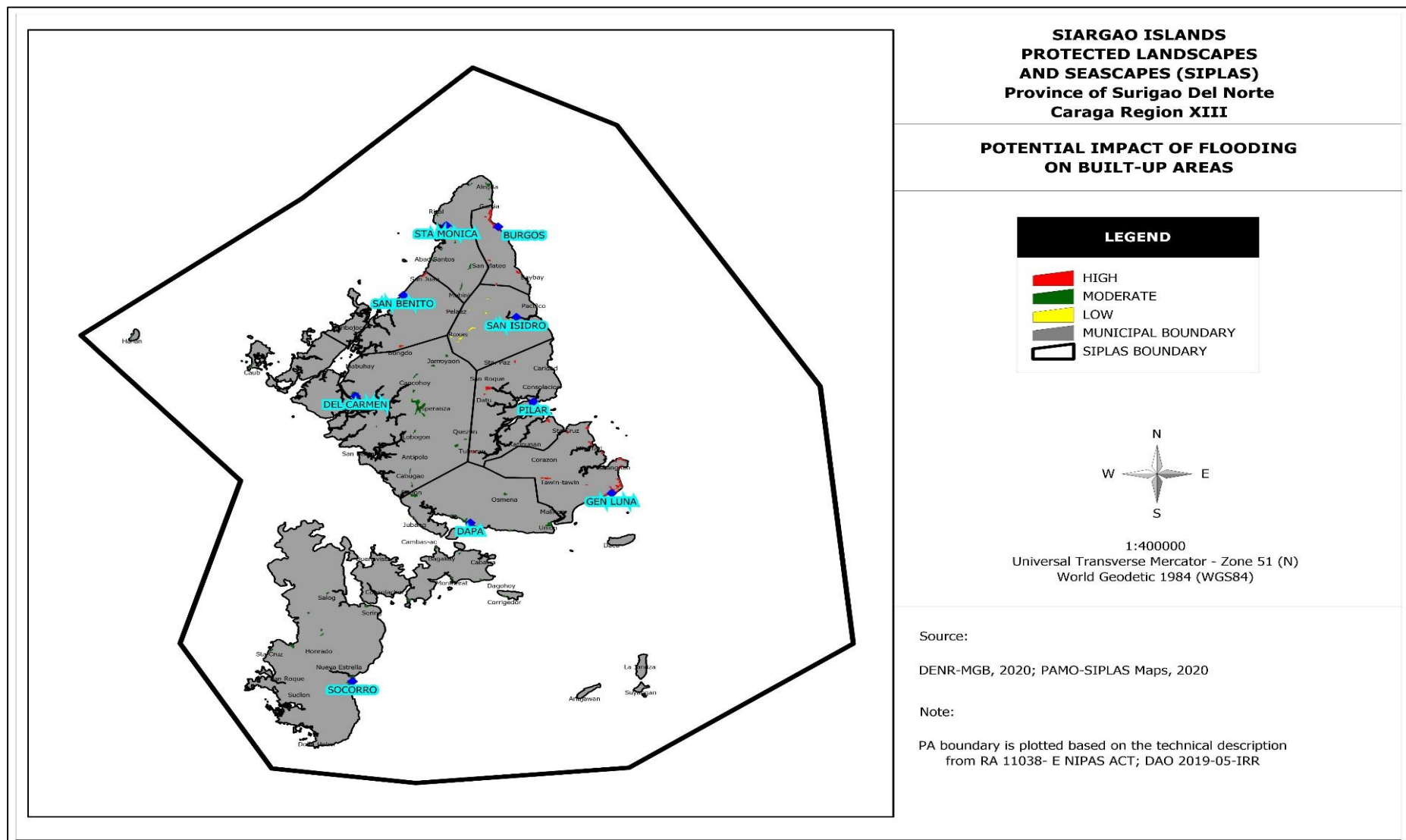


Figure 48. Potential Impact of Flooding on Built-up Areas in SIPLAS

Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

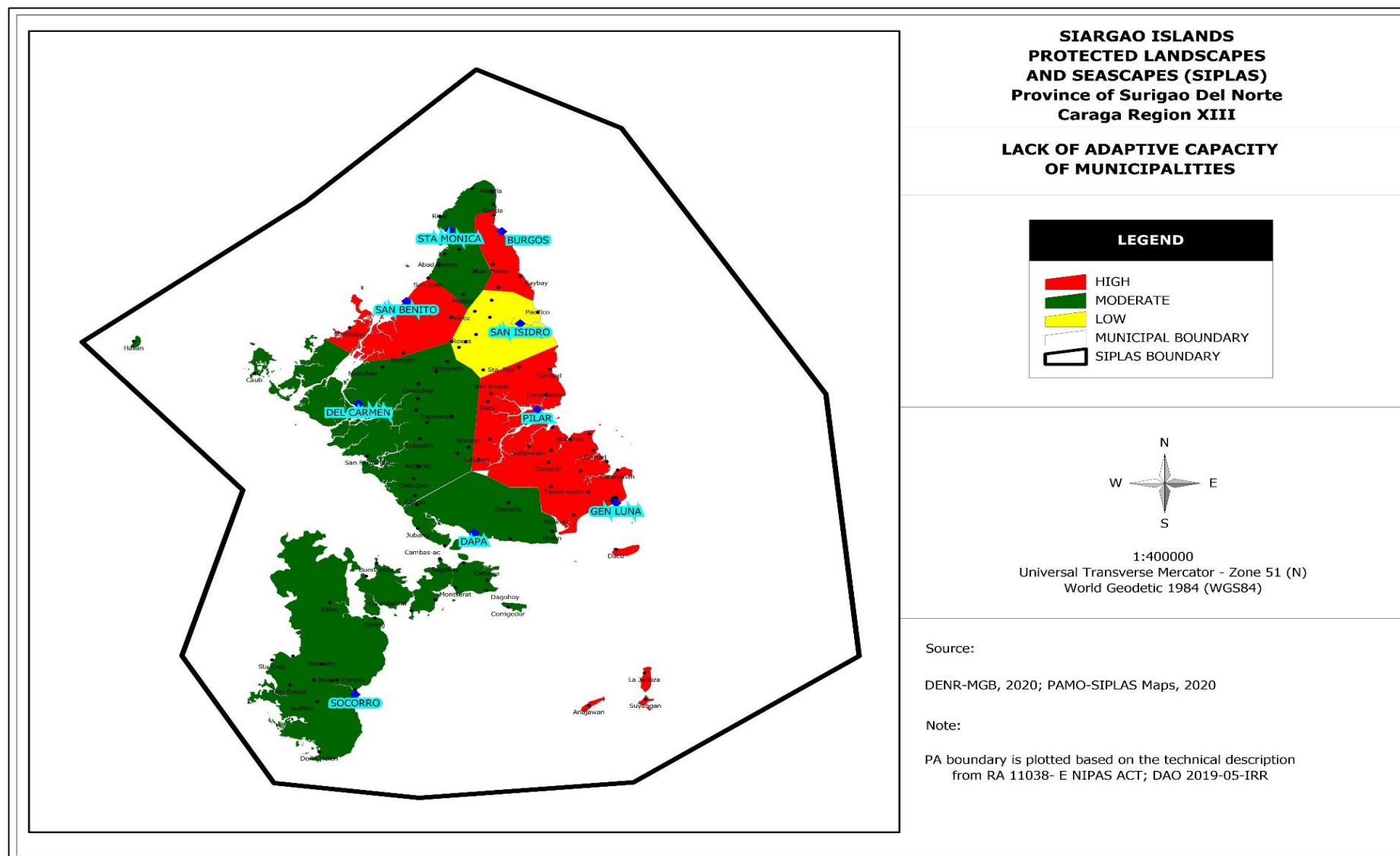


Figure 49. Map showing the Lack of Adaptive Capacity of Households in nine (9) Municipalities of SIPLAS

Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

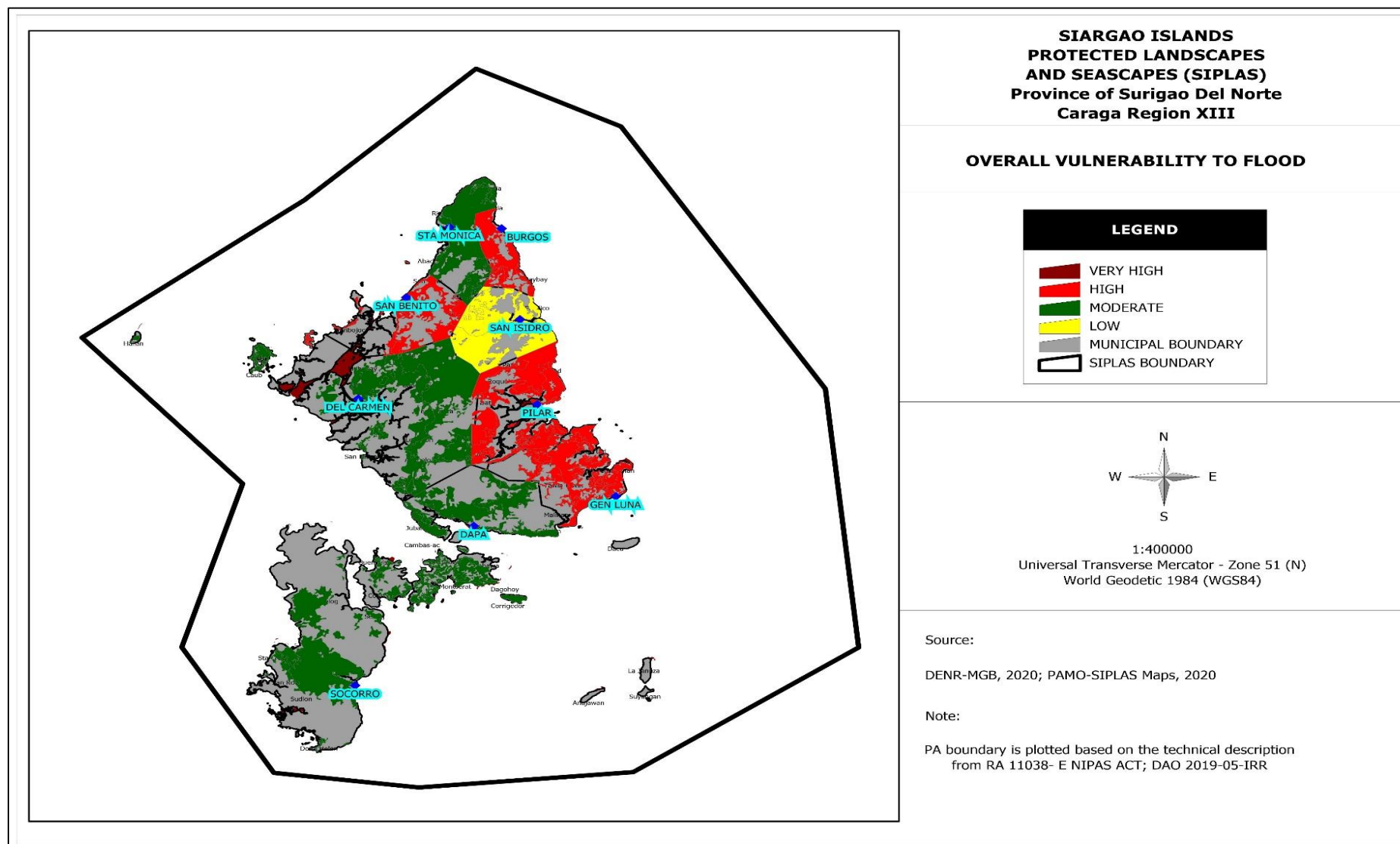


Figure 50. Vulnerability of SIPLAS to Flooding

Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

❖ **Landslides will also negatively impact a large part of SIPLAS population as well as its biodiversity resources**

Approximately 67% or 20,908 hectares of SIPLAS total agricultural lands are vulnerable to landslides as shown in Figure 49. The potential impact of landslides on agriculture is high in approximately 6,783 hectares or at 22% of total agricultural lands, moderate in 8,576 hectares or at 27%, and low in 5,550 hectares or at 18%. The agricultural lands most vulnerable to landslides are Sta. Monica, San Benito, Del Carmen, San Isidro, Dapa, and Socorro.

The potential impact on 60 hectares or 8% of the built up areas is high and 80 hectares will be moderately impacted. Landslide will also affect both terrestrial and marine biodiversity resources as shown in Table 65 and 66. The potential impact on biodiversity loss is high in approximately 10,800 hectares of mostly natural forests and brush/shrubs. The occurrence of landslides in these areas will destroy the associated biodiversity of these ecosystems.

Table 65. Threatened Terrestrial Vertebrate Species within SIPLAS

Scientific Name	Common Name	Conservation Status*	
		IUCN	DAO No. 2019-09
1. Birds			
➤ <i>Aethopyga pulcherrima</i> **	Siwit		EN
➤ <i>Alcedo argentata</i>	Silvery Kingfisher	VU	VU
➤ <i>Anas luzonica</i> **	Philippine Duck	EN	VU
➤ <i>Buceros hydrocorax mindanensis</i> **	Kalaw/ Rufous Hornbill	EN	EN
➤ <i>Cacatua haematuropygia</i>	Philippine Cockatoo	CR	CR
➤ <i>Eurylaimus steerii</i>	Mindanao Broadbill	VU	VU
➤ <i>Mimizuku gurneyi</i>	Giant Scops-owl	VU	VU
➤ <i>Penelopides affinis</i> **	Tilik/ Tarictic Hornbill		
➤ <i>Phapitreron brunneiceps</i> **	Short -billed Brown Dove		EN
➤ <i>Todiramphus winchelli</i> **	Rufous Lored Kingfisher		VU
➤ <i>Tringa brevipes</i>	San Piper	NT	
2. Mammals			
a. <i>Acerodon jubatus</i>	Golden-crowned fruit bat	EN	EN
b. <i>Cynocephalus volans</i>	Flying Lemur	VU	OTS
c. <i>Dugong dugon</i>	Philippine Dugong	VU	CR
e. <i>Podogymnura aureospinula</i>	Dinagat gymnure	EN	VU
f. <i>Sus philippinensis</i>	Philippine warty pig	VU	VU
g. <i>Tarsius syrichta</i> **	Philippine Tarsier	NT	EN
3. Reptiles			
c. <i>Cuora amboinensis</i>	Bao	EN	
e. <i>Hydrosaurus pustulatus</i>	Philippine sailfin lizard	VU	

Legend: * VU – vulnerable; CR – critically endangered; EN – endangered; OTS – other threatened species; NT – Near Threatened

Source: National Science Research Institution. Moran *et. al*, CY 2019 (Unpublished); ** Population Survey of Philippine Tarsier in San Miguel, San Isidro, CY 2021; Eastern Mindanao Biodiversity Conservation Framework. Davao City, Philippines, pp 41-45, 2008.

Table 66. Threatened Terrestrial Plant Species within SIPLAS

Scientific Name	Common Name	Conservation Status*	
		IUCN	DAO No. 2017-11
Non-Timber			
<i>a. Aracnis flos-aeris</i> *	Spider Orchids		VU
<i>b. Asplenium sp.</i> **	Pugad Lawin		VU
<i>c. Cycas edentata</i> *	Pitogo	NT	VU
<i>d. Dendrobium schuetzei</i>	Orchid	CR	CR
<i>e. Guioa bicolor</i>	Kaninging	VU	OTS
<i>f. Granaria querciafolia</i> *			EN
<i>g. Medinilla surigaoensis</i>	Eastern Mindanao medinilla	EN	EN
<i>h. Nepenthes merrilliana</i>	Mindanao giant pitcher plant	VU	CR
<i>i. Sararanga philippinensis</i> *	Baliw		
Timber			
<i>a. Anisoptera costata</i>	Mindanao palosapis	EN	EN
<i>b. Aphanamixis polystachya</i> **	Sabon-sabon		OTS
<i>c. Artocarpus blancoi</i> **	Antipolo		VU
<i>d. Canarium ovatum</i>	Pili	VU	OTS
<i>e. Carallia brachniata</i> **	Bagobakhaw		OTS
<i>f. Kibatalia puberula</i>	Paslit-mabolo	EN	EN
<i>g. Hopea acuminata</i> **	Mangachapoi		EN
<i>h. Hopea brachyptera</i>	Mindanao narek	CR	CR
<i>i. Macaranga grandifolia</i> **	Binunga		VU
<i>j. Palaquium luzoniensis</i>	Red Nato/Naato	VU	VU
<i>k. Pterocarpus indicus</i> **	Narra	EN	VU
<i>l. Saribus rotundifolius</i> **	Anahaw		OTS
<i>m. Securinega flexuosa</i> **	Anislag		VU
<i>n. Shorea ovate</i>	Tiaong	EN	EN
<i>o. Terminalia foetidissima</i> **	Bagotalisay		VU
<i>p. Vitex parviflora</i> **	Tugas		EN
<i>q. Xanthostemom verdugonianus</i>	Mancono, "Iron wood"	VU	EN

Legend: VU – vulnerable; CR – critically endangered; EN – endangered; OTS – other threatened species; NT – Near Threatened

Reference: Philippine Eagle Foundation, Conservation International-Philippines, Department of Environment and Natural Resources CY 2008; Eastern Mindanao Biodiversity Conservation Framework. Davao City, Philippines, pp 41-45; *CY 2008; National Science Research Institution. Moran *et. al*, CY 2019 (Unpublished); **Population Survey of Philippine Tarsier in San Miguel, San Isidro, CY 2021

The vulnerability map of SIPLAS to landslides was developed by combining the potential impact of landslides on agriculture, settlement, and biodiversity with the adaptive capacity map, as shown in Figure 41. The vulnerability map shows that the majority of the areas in SIPLAS nine (9) municipalities are highly vulnerable to landslides.

- ❖ **With the projected climate change hazards, particularly the projected increase in temperature of up to 1.5°C, local extinction of plants and non-volant animals is also possible**

Because SIPLAS is an island ecosystem, local extinction of plants and non-volant animals is likely to be faster, which is bad news for terrestrial biodiversity. Table 65 and 66 shows some of the plant and vertebrate species that are endangered as a result of climate change. It's worth noting that biological systems are capable of adapting. For example, the basic adaptation of terrestrial plants and animals is to shift or relocate to elevation zones that mimic old habitat conditions as a result of rising temperatures. The island properties of SIPLAS, on the other hand, may make this function impossible.

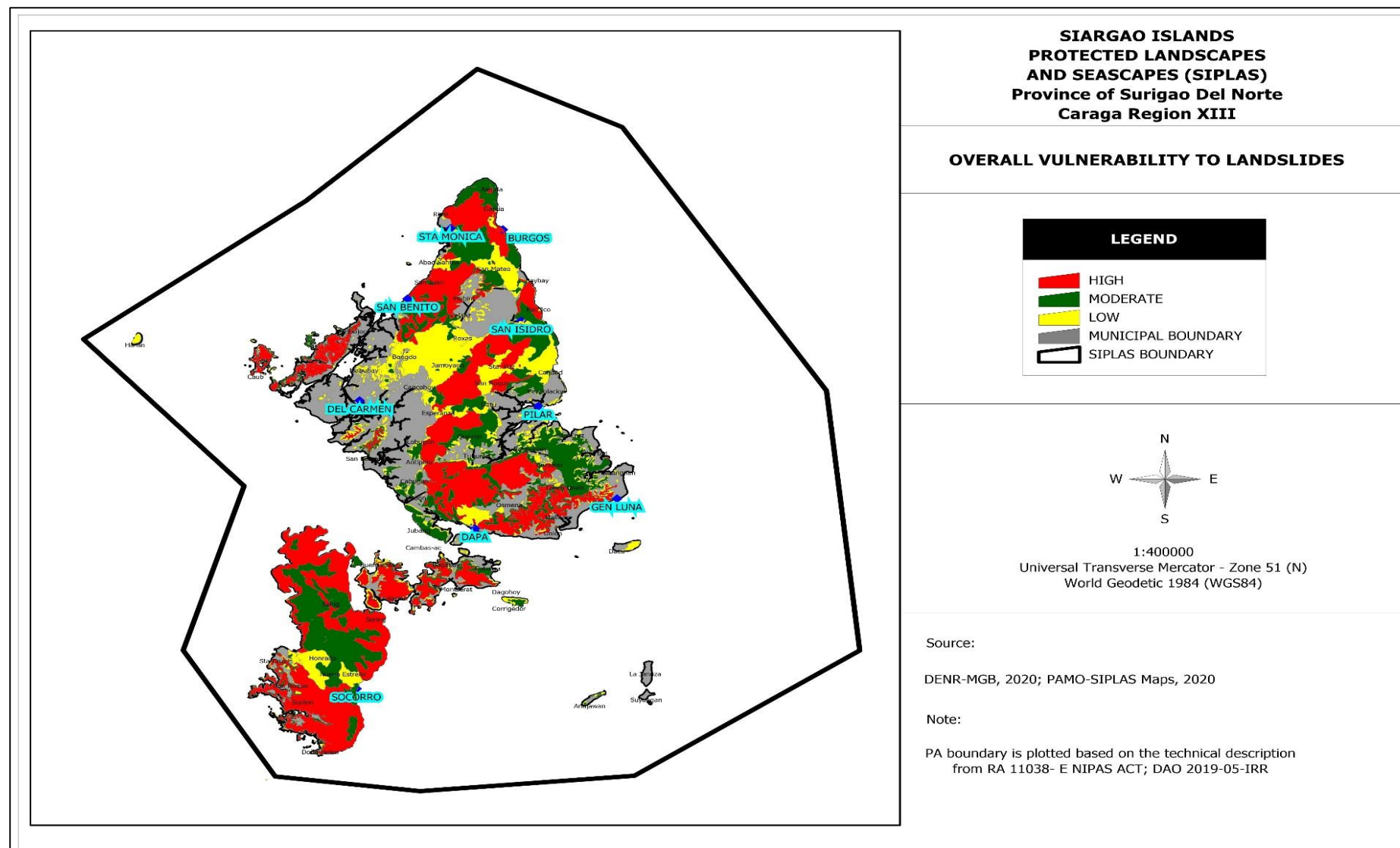


Figure 52. Vulnerability of SIPLAS to Landslides

Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

4.2.2 Vulnerability of Coastal Ecosystems and Communities

Based on the study conducted by World Bank (CY 2013) on global sea level rise, it reveals that the Philippines' sea level could rise from 0.9-1.1 meters under the Representative Concentration Pathway 8.5 climate scenario. Even assuming a conservative scenario of 0.5-meter rise in sea level, approximately 2,263 hectares of agricultural land and nearly one third of the built-up areas or 205 hectares in SIPLAS would be completely submerge. Furthermore, crop production in adjacent agricultural lands could decrease significantly due to salt water intrusion. Nearly 80% of the remaining mangroves or equivalent to 6,070 hectares would be drowned as sea levels increase. This will adversely affect biodiversity resources associated with mangrove properties of local communities. Overall, this will impact food production, infrastructures, livelihood, and property (SIPLAS Management Plan CY 2018).

Figure 51 depicts the total susceptibility map to a 0.5-meter sea level increase, taking into account the adaptive capacity of local municipalities in SIPLAS. Del Carmen, San Benito, the eastern parts of Pilar and General Luna, as well as some of Dapa's southern parts, are all vulnerable to a 0.5-meter increase in sea level. Table 67 shows the exposed population in SIPLAS to sea level rise. The municipality of Del Carmen, General Luna, and Pilar are moderately exposed to this hazard.

Table 67. Exposed Population: SEA LEVEL RISE

Municipality	Population 2015	TOTAL EXPOSED POPULATION		Rating
		Number	%	
1. Burgos	4,034	437	10.83	Very Low
2. Dapa	23,787	8,492	35.70	Low
3. Del Carmen	18,392	8,127	44.19	Moderate
4. General Luna	16,771	8,265	49.28	Moderate
5. Pilar	9,752	4,980	51.07	Moderate
6. San Benito	5,404	1,321	24.44	Low
7. San Isidro	7,325	1,408	19.22	Very Low
8. Sta. Monica	8,808	1,951	22.15	Low
9. Socorro	22,314	2,803	12.56	Very Low
Sub-Total	116,587	37,784		

Source: PDPFEP-SDN, CY 2017-2028

❖ **Settlements in coastal areas and low-lying communities are highly prone to storm surges caused by more intense typhoons**

Tropical cyclones in the area normally occur between November and April, according to DOST PAGASA records. There were twenty-four (24) tropical cyclones of different types that struck the Caraga Region and the Siargao Islands between CY 2008 and CY 2020, including Typhoon Yolanda, Typhoon Pablo and Typhoon Basyang as presented in Table 68.

Storm surges of up to four (4) meters would threaten nearly 134 hectares or at 20% of the built-up areas in SIPLAS, especially those communities facing the Pacific Ocean or the eastern seaboard. Storm surges can also damage agricultural areas, estimated to cover 967 hectares, surrounding these communities. Furthermore, if a storm surge of four (4) meters occurs, mangrove trees and other natural forests along coastal areas covering around 839 hectares would be at high risk of being destroyed, including their biodiversity properties.

The storm surge's may impact the farmland, settlements, and biodiversity resources estimated to be about 2,000 hectares as shown in Figure 52. These are mostly located in San Benito, Sta. Monica, Burgos, Pilar, General Luna, Dapa and Del Carmen (SIPLAS Management Plan CY 2018).

Table 68. Cyclones that Affected Caraga Region from CY 2008-2020

Year	Philippines	Caraga Region		
		No.	Tropical Name	Month
2008	21	4	Tropical Storm (Ambo)	April
			Tropical Depression (Rolly)	November
			Tropical Storm (Quinta)	November
			Tropical Depression (Tonyo)	November
2009	22	2	Tropical Depression (Bising)	February
			Tropical Depression (Urduja)	November
2010	11	0	-	-
2011	19	1	Tropical Storm (Sendong)	December
2012	17	2	Tropical Storm (Ofel)	October
			Typhoon (Pablo)	December
2013	25	2	Typhoon (Yolanda)	November
			Tropical Depression (Zoraida)	November
2014	19	4	Tropical Depression (Basyang)	January
			Tropical Depression (Caloy)	March
			Tropical Storm (Queenie)	November
			Tropical Storm (Seniang)	December
2015	18	1	Tropical Depression (Onyok)	December
2016	13	1	Severe Tropical Depression (Tokage)	November
2017	22	2	Tropical Depression (Auring)	January
			Typhoon (Vinta)	December
2018	21	2	Tropical Storm (Agaton)	January
			Tropical Storm (Basyang)	February
2019	21	1	Tropical Depression (Amang)	January
2020	22	2	Tropical Depression (Ofel)	October
			Tropical Storm (Vicky)	December

Source: DOST PAG-ASA, CY 2020

❖ **Another hazard faced by coastal communities of SIPLAS is tsunami**

About 4,008 hectares or equivalent to 13% of agricultural fields and 230 hectares or at 31% of built-up areas are at risk from tsunami. The tsunami would damage about 2,345 hectares of mangroves and other natural habitats, potentially damaging the related wildlife resources in these areas. Combining potential impacts of tsunami on agriculture, built-up areas and biodiversity, and considering the adaptive capacity of communities indicate that the highly vulnerable areas to tsunami are found along the eastern seaboard of Pilar, Burgos, and General Luna, as well as portions of Dapa, Socorro, and Sta. Monica as shown in Figure 53 (SIPLAS Management Plan CY 2018).

❖ **A large number of barangays are vulnerable to multi-hazards**

A multi-hazard analysis was conducted to identify areas that are highly susceptible to combination of hazards. The analysis was done at the barangay level by overlaying the barangay boundary map with the vulnerability map for each hazards. Assuming that each hazard is equally important, a multi-hazard vulnerability index was derived for each barangay and the corresponding multi-hazard map was developed as presented in Figure 54. Based on the result, Pilar and San Benito are the LGUs most vulnerable to multi-hazards, with 83 % and 80% of their barangays being extremely vulnerable. Other municipalities with high percentages of barangays vulnerable to multi-hazards are Dapa and General Luna (79 % of barangays), Sta. Monica (73 %), and Burgos (66 %). San Isidro is the least vulnerable municipality with 8% of its barangays is highly vulnerable to multiple hazards. Del Carmen and Socorro have 30% and 50% of their barangays that are highly vulnerable to multi-hazards (SIPLAS Management Plan CY 2015).

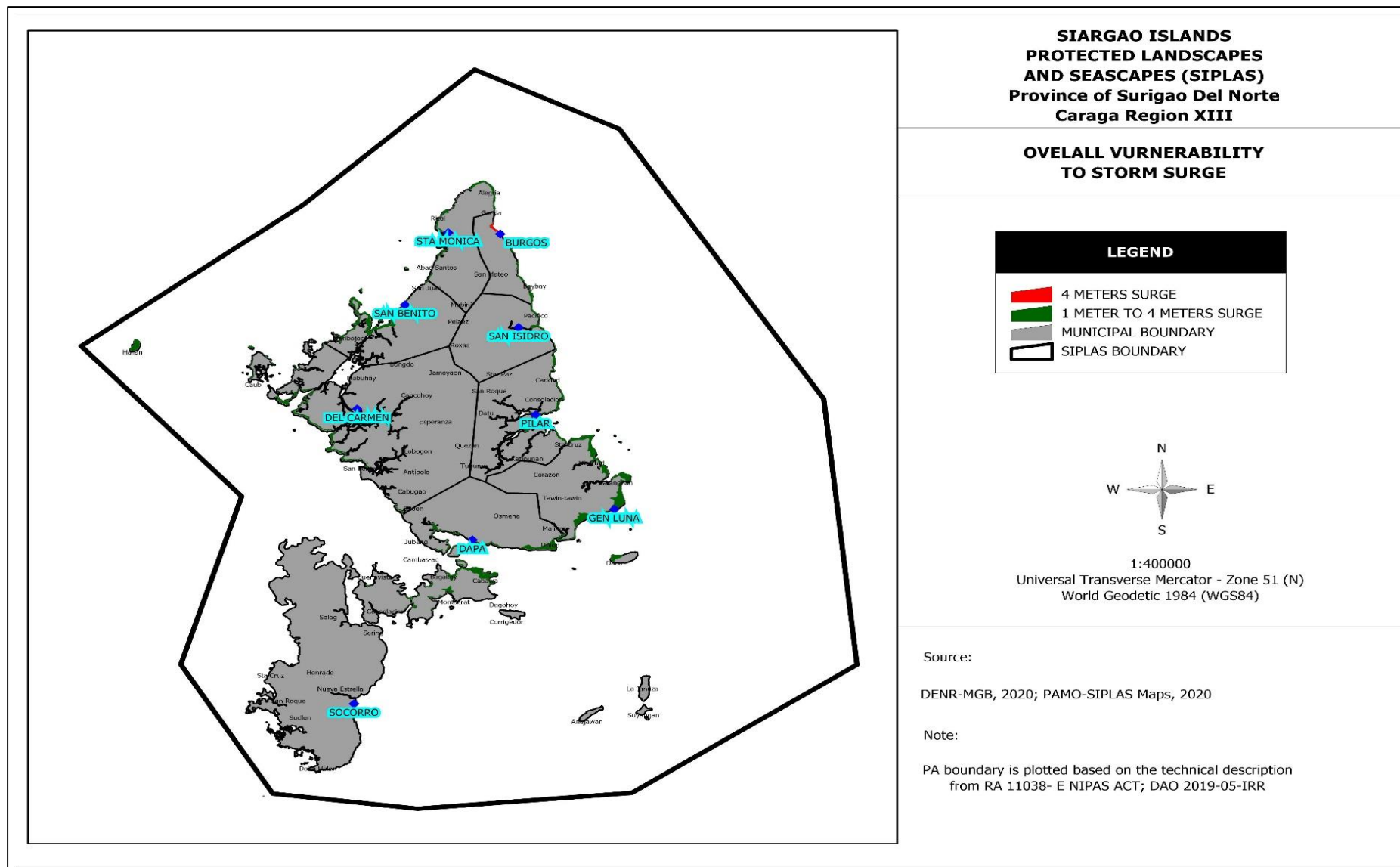


Figure 54. Vulnerability of SIPLAS to Storm Surge

Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

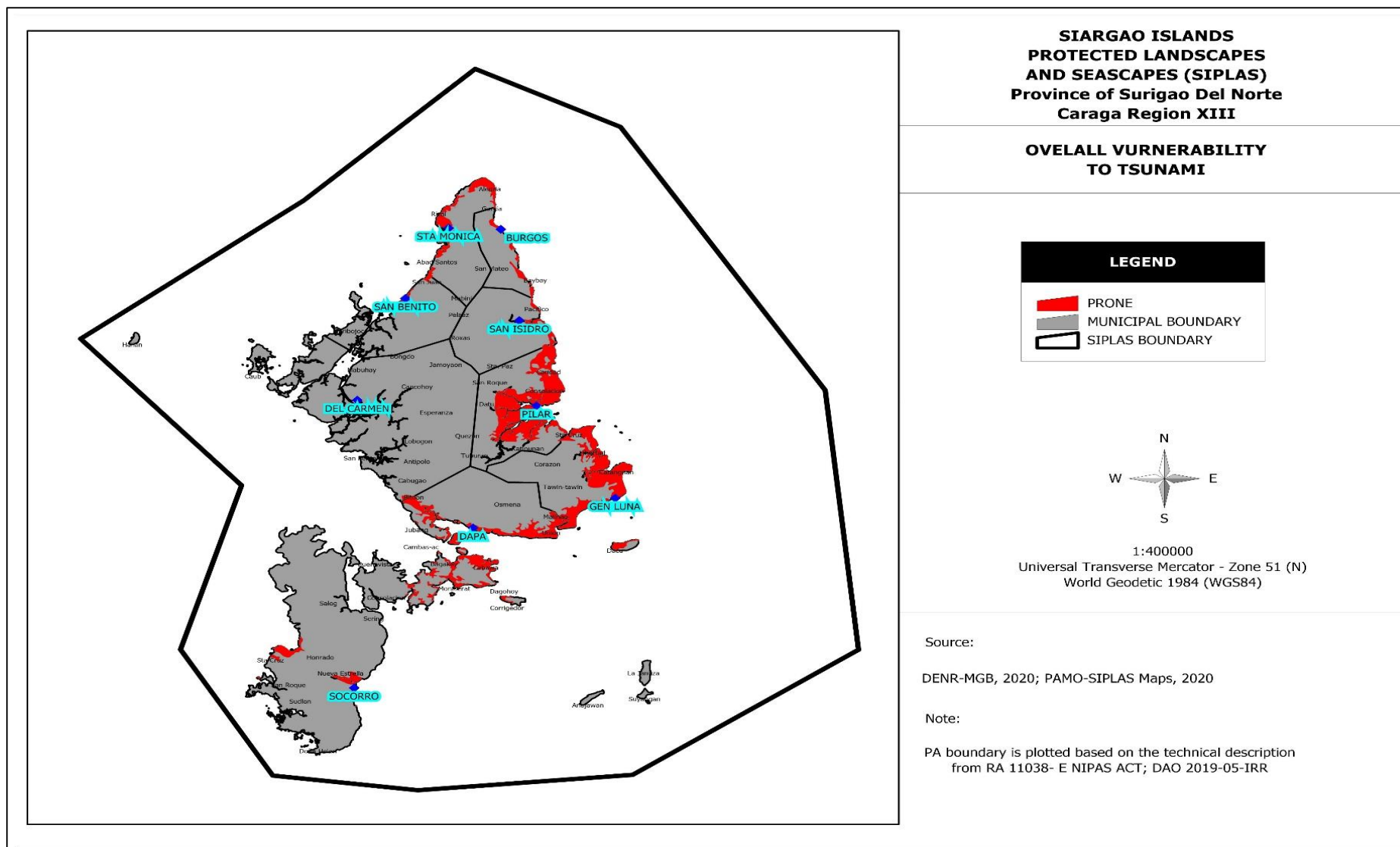


Figure 55. Vulnerability of SIPLAS to Tsunami

Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

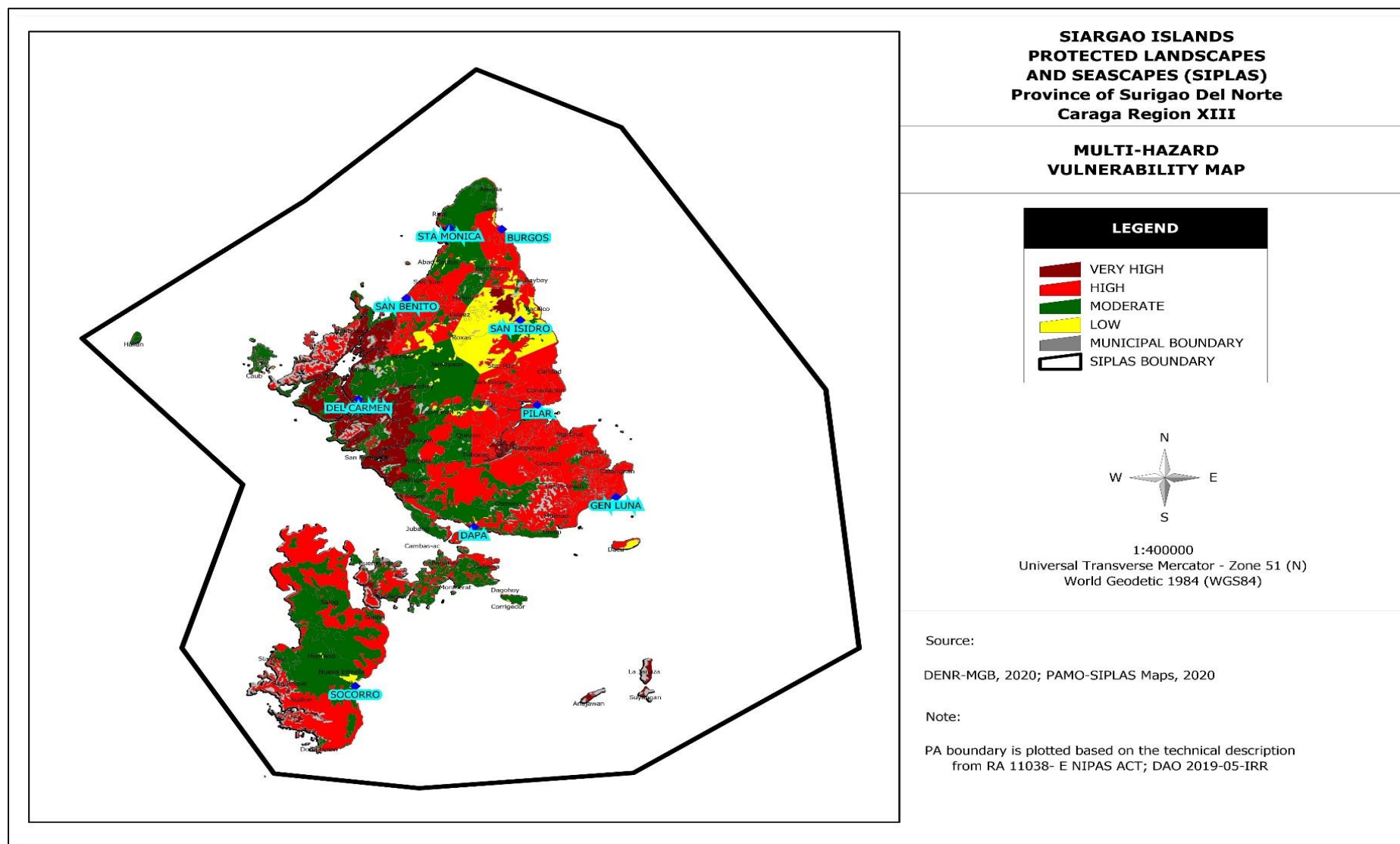


Figure 56. Multi-Hazard Vulnerability Map of SIPLAS

Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

❖ **Coastal fisheries of municipalities of Sta. Monica, Burgos, San Isidro, Pilar and General Luna are highly vulnerable**

Based on SIPLAS Management Plan CY 2015, Socorro's coastal fisheries are moderately vulnerable, while municipalities of San Benito, Del Carmen, and Dapa are not. These results are based on research conducted for SIPLAS using the Tool for Understanding Resiliency of the Fisheries (TURF). The tool helps the identification of barangays or municipalities that are vulnerable to sea level rise, wave action or storm surge, and sea surface temperature rise. Fisheries, coral ecosystems, and socio-economic factors are among the components mostly studied. In conclusion, if a big part of the SIPLAS population is largely dependent on fishing and the coral reefs occupies a narrowed area (in terms of hectares) and are very susceptible to wave action, the population is highly vulnerable. Table 69 shows a summary of the vulnerability on coastal fisheries using the VA-TURF. Meanwhile, Figure 55 shows the map for overall vulnerability of coastal fisheries in SIPLAS.

Table 69. Summary of Vulnerability on Coastal Fisheries using the VA-TURF

Municipality	Wave Exposure	Component						Vulnerability			Overall score
		Fisheries (F)		Reef ecosystem (RE)		Socio-economic (SE)					
		PI	AC	PI	AC	PI	AC				
Sta. Monica	H	H	M	H	H	M	L	H	M	H	H
San Benito	L	M	M	M	H	L	L	M	L	M	L
Del Carmen	L	M	M	M	H	L	L	M	L	M	L
Dapa	L	L	M	M	H	L	H	L	L	L	L
Socorro	M	H	H	H	H	L	L	M	M	M	M
Burgos	H	H	M	H	L	M	L	H	H	H	H
San Isidro	H	H	L	H	L	M	L	H	H	H	H
Pilar	H	H	M	H	H	M	L	H	M	H	H
Gen Luna	H	H	M	H	H	M	L	H	M	H	H

Legend: PI=potential impact, AC=adaptive capacity, F=fisheries component, RE=reef ecosystem component, SE=socio-economic component; L=low (green), M=medium (yellow), H=high (red)

Source: SIPLAS Management Plan CY 2015

To explain further, highly vulnerable coastal fisheries are at high risk of negative impact, these areas may need to strengthen or boost their ecological component such as coral reefs, fisheries, and socio-economic adaptation capacities. The socio-economic aspect is the easiest to control of the three, for example, reducing fishermen's reliance on fishing. In relation to this, other elements must be strengthened, such as creation of MPAs to improve the coral environment aspect and stringent enforcement of fisheries ordinances to improve the fisheries component.

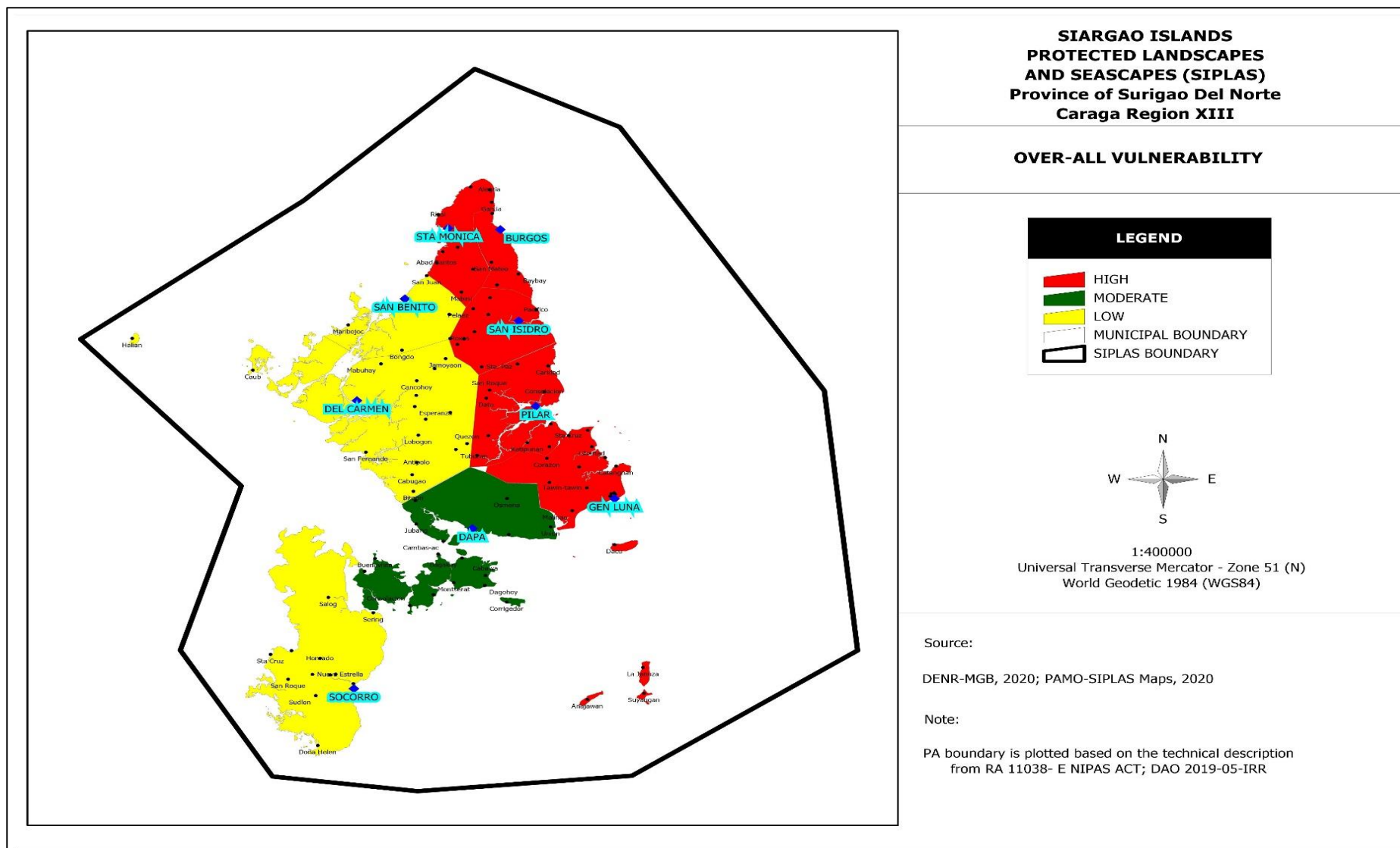


Figure 57. Map for Vulnerability of Coastal Fisheries in SIPLAS

Source: DENR/Mines and Geo-Sciences Bureau (MGB) Hazard Mapping, CY 2020

❖ Vulnerable in increase sea surface temperature

Similarly, SIPLAS coastal and marine ecosystems are vulnerable to the increase in sea surface temperature that causes coral bleaching, ocean acidification, seagrass scarring, etc. as well as other factors such as oil spill and ship grounding.

SIPLAS is also prone to oil spill incidents given that majority of the ecotourism destinations are accessible via pumpboats/yatch. Likewise, SIPLAS is also susceptible to ship grounding incident where ships may sail closer to the coral reef or in rocky areas.

The threatened and vulnerable marine biodiversity resources in SIPLAS are presented in Table 70.

Table 70. Threatened Marine Fauna Species within SIPLAS

Scientific Name	Common Name	Conservation Status*	
		IUCN	DAO No. 2019-09
1. Mollusk			
<i>a. Tridacna gigas</i>	Gian clams	VU	
2. Fish			
<i>a. Epinephelus fuscoguttatus</i>	Brown marbled grouper	VU	
3. Corals			
<i>a. Nemezophyllia turbida</i>	Fox Coral		VU
4. Mammals			
<i>a. Kogia breviceps</i>	Pygmy Spermwhale		
<i>b. Nemezophyllia turbida</i>	Fox Coral		VU
5. Reptiles			
<i>a. Chelonia mydas</i>	Green sea turtle	EN	EN
<i>b. Crocodylus porosus</i>	Philippine Crocodile	EN	
<i>d. Erythmochelys imbricata</i>	Hawksbill turtle	CR	CR

Legend: *VU – vulnerable; CR – critically endangered; EN – endangered; OTS – other threatened species

Source: Philippine Eagle Foundation, Conservation International-Philippines, Department of Environment and Natural Resources 2008; *CY 2008; National Science Research Institution. Moran *et. al*, CY 2019 (Unpublished); ** Population Survey of Philippine Tarsier in San Miguel, San Isidro, CY 2021; Eastern Mindanao Biodiversity Conservation Framework. Davao City, Philippines, pp 41-45, 2008.

❖ Coral Bleaching Probability data in SIPLAS

The province of Surigao del Norte, including the proposed Manage Access Areas of Burgos, Dapa, Del Carmen, General Luna, Pilar, San Benito, San Isidro, and Sta Monica rated as having high climate change vulnerability, despite being the best performing region in the country and having a better than average Climate Change Vulnerability Assessment (CCVA) score as presented in Figure 56.

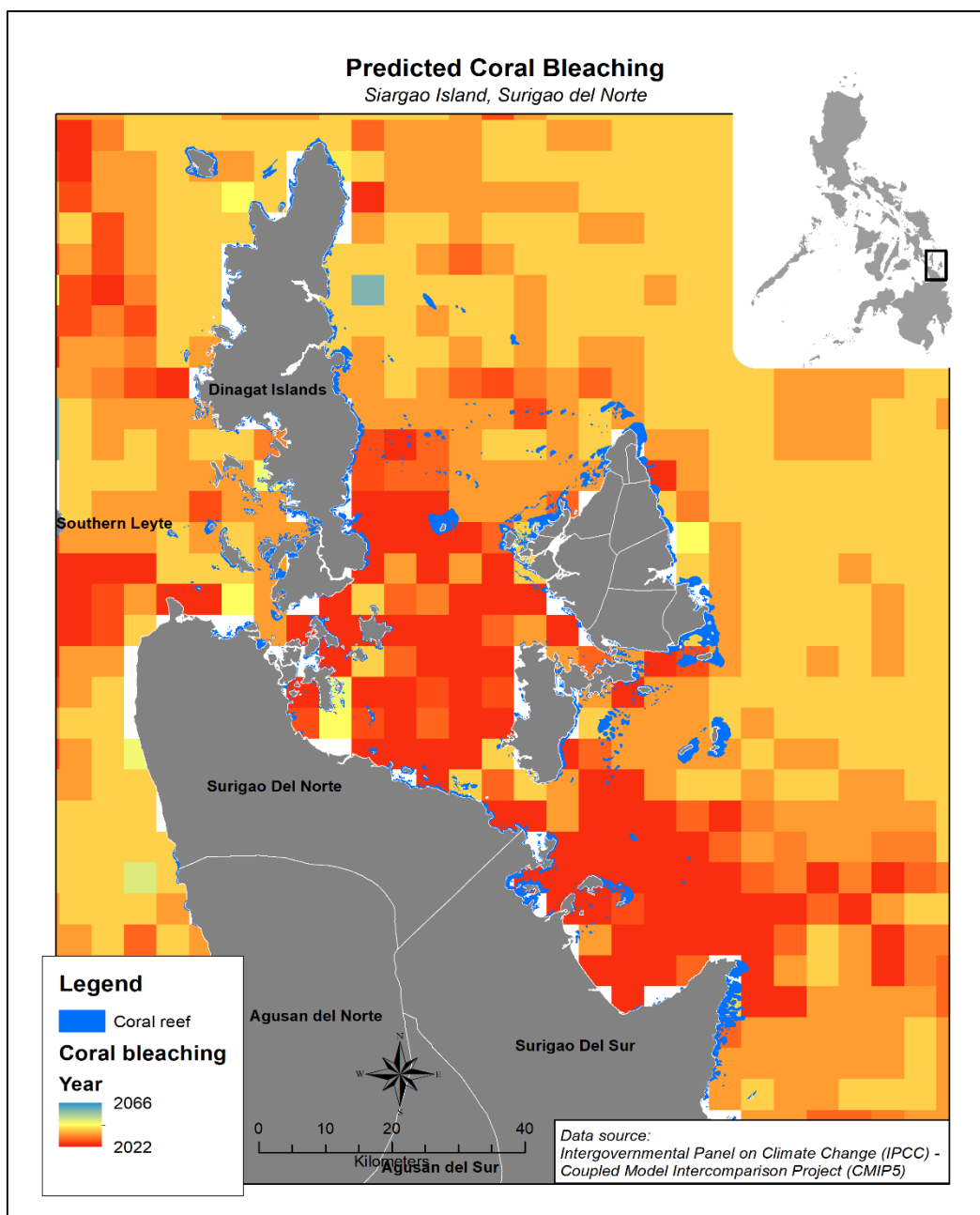


Figure 58. Predicted Coral Bleaching in SIPLAS due to climate change
Source: Fish Forever: Climate Change Vulnerability Assessment (February, CY 2019)

An effective response plan procedure for coral bleaching should be considered in the occurrence of such incident. There are five (5) stages of response to coral bleaching which includes the early warning system, incident response, impact assessment, management action, and communication strategy.

For seagrass scarring, there are three (3) identified stages of responses which includes before (early warning system, spot checking, and habitat surveillance), during (incident response), and after (impact assessment).

Likewise, oil spill and ship grounding response procedures includes three (3) stages that also includes before (early warning system, spot checking, and habitat surveillance), during (incident response), and after (impact assessment).

4.3 Key Policy, Institutional and Financing Management Issues and Concerns

The SIPLAS PAMO manpower capabilities have been inadequate to meet SIPLAS' growing demand for better and efficient management. The staffing required for the protected area's daily operations must be re-evaluated and the requisite training must be established. Staffs must be well trained in protected area planning, implementation, monitoring, and enforcement. The regulatory mechanism is currently limited to patrol operations, which is inadequate to regulate illegal activities in forestlands, coastal and marine zones.

The SIPLAS PAMB's ability to serve as the primary governance body responsible for SIPLAS management needs to be enhanced. It would be necessary to assess and resolve the PAMB's inability to react to concerns and problems that need urgent attention and judgment. The SIPLAS PAMB will be exposed to effective protected area management strategies, which will make them become more innovative and responsive to protected area management needs.

The LGUs level of awareness on the impacts of climate change in SIPLAS is still low. Their appreciation of the integrated. The transition from individual LGU-based planning to integrated ecosystem-based planning and management should result in the harmonization of the revised protected area management plan with the updated LGU CLUPs, as well as the inclusion of climate change adaptation planning and disaster risk mitigation and management into the CLUP.

In terms of financing, considering SIPLAS' growing tourism industry and the increasing development activities such as the construction of hotels, tourism facilities, and business establishments, there are numerous opportunities to generate funding for conservation activities. It is essential to harmonize fees and charges levied by municipalities, barangays, and the DENR in order to eliminate duplication and competition. Innovative funding schemes, as well as the formation of alliances and co-management operations with various stakeholders, should be studied. To update rules, protocols, and processes related to resource mobilization and allocation for SIPLAS management, the SIPLAS PAMB policies and Manual of Operations may need to be revisited.

4.4 Development Opportunities

4.4.1 Eco-Tourism

SIPLAS sees ecotourism as a significant growth opportunity. SIPLAS will have more ecotourism goods and sites due to its stunning landscape and seascape as well as its diverse habitats. Among those that can be improved and encouraged further are:

- New surfing spots
- Wind Surfing
- Snorkeling in PO-managed coastal reserves
- Scuba Diving
- New game fishing sites
- Mangrove tour and kayaking
- Agri-tourism
- Cave Educational Tour
- Wetland guided tours
- Hills/Summit Trek and Viewing
- Wilderness Camping Treks
- Nature hiking
- River Tours
- Nature Photography and Videography
- Wildlife Watching

In Siargao, community-based eco-tourism has a lot of potential. Growing private tourism investments would continue to boost jobs in the area. The active role of the locals in the community-based eco-tourism supports local tourism industry. Involvement of communities in guided tours, service providers, caterers, and local operators ensures economic incentives for community and thereby solicit their active involvement in conservation and management of the natural resources and eco-destinations.

4.4.2 Provincial and Municipal LGU Support

The help of provincial and municipal Local Government Units (LGUs) in the promotion of sustainable eco-tourism growth as a core development drive in SIPLAS is critical to the alignment of priorities and strategic directions of the various LGUs. This shared interest would lay the groundwork for greater equity in the use of SIPLAS services.

4.4.3 External Assistance

National institutions and foreign-funded programs are paying more attention to SIPLAS. The SIPLAS PAMO and SIPLAS PAMB should be able to guide technical support to areas/activities that will provide the LGUs, SIPLAS PAMO, and SIPLAS PAMB with valuable learning, planning, and decision-making tools, as well as financing for critical management activities (SIPLAS Management Plan CY 2015).

4.5. Analysis of Key Stakeholders

This section addresses the SIPLAS stakeholders, including (a) those agencies and organizations inside or outside the protected area that have mandates relating to the management of the protected area, (b) those SIPLAS households, communities and entities that profit from the resources of the protected area, and (c) external organizations and individuals who also profit from the assets of SIPLAS, such as visitors, buyers of Siargao Island fish and other items. Below are those stakeholders that come under (a) and (b).

➤ Department of Environment and Natural Resources (DENR)

The primary government department overseeing the NIPAS is the DENR. The Chair of the SIPLAS Protected Area Management Board (PAMB) is the DENR Regional Executive Director (RED) for the Caraga Region. It assigns to SIPLAS the Protected Area Superintendent (PASu) who acts as the Chief Operating Officer of DENR in the protected area and who provides the PAMB with secretariat support. It allots an annual budget for the SIPLAS PAMO and SIPLAS PAMB activities and assigns staff support to the PAMB. It was only until recently that a full time PASu was designated for SIPLAS.

As tourism development activities are expected to boom in the coming years, the Environmental Management Bureau (EMB) is also a significant SIPLAS stakeholder. Because the Siargao Islands are a protected area, the EMB must ensure that tourism and other establishments comply strictly with the criteria of the Environmental Impact Assessment (EIA) System. The EMB's priorities also cover solid waste management and waste water management.

➤ Other National Government Agencies

There are other national government agencies that are also concerned about the sustainable management of SIPLAS and its population's socio-economic situation. These agencies are listed in Table 71.

Table 71. Other National Government Agencies (NGAs) with involvement in SIPLAS Management

NGAs	Mandate
Department of Interior and Local Government (DILG)	<ul style="list-style-type: none">• Compliance with land use planning requirements• Support and assistance to the formation and strengthening of inter-LGU alliance in SIPLAS, e.g., MPA Network• Monitoring of the performance of LGUs based on DILG indicators• Recognition of LGU performance and awarding of Good Housekeeping Seal which has as a criterion good environmental management

NGAs	Mandate
Climate Change Commission (CCC)	<ul style="list-style-type: none"> Follow up support to its Ecotown initiatives in four LGUs; Monitoring the compliance of LGUs to the requirements of the Climate Change Act
Department of Tourism (DOT)	<ul style="list-style-type: none"> Support to Province and LGUs in the promotion of Siargao Islands as tourist destination Development of tourism plan and tourism products Linking SIPLAS with other tourism hubs in the Region and whole of Mindanao
Bureau of Fisheries and Aquatic Resources (BFAR)	<ul style="list-style-type: none"> Support and assistance to LGUs in the enforcement of fisheries laws and policies, provision of training to LGUs on enforcement Assistance to LGUs in the implementation of sustainable fishing practices Assistance to coastal communities on fisheries-related livelihoods
Department of Agriculture (DA)	<ul style="list-style-type: none"> Support and assistance to LGUs and farming organization on the adoption of climate smart and sustainable agricultural practices Provision of assistance in the development of small irrigation systems appropriate to SIPLAS conditions Promotion of crop diversification
National Irrigation Association	<ul style="list-style-type: none"> Assessment and assistance in the development of irrigation facilities for SIPLAS communities
Department of Trade and Industry (DTI)	<ul style="list-style-type: none"> Provision of skills training and livelihood support to communities
Department of Social Welfare and Development (DSWD)	<ul style="list-style-type: none"> Provision of livelihood support and community facilities from its various projects
Department of Health (DOH)	<ul style="list-style-type: none"> Develop national plans, technical standards, and guidelines on health Provider of special tertiary health care services and technical assistance to health providers and stakeholders
Department of Public Works and Highways (DPWH)	<ul style="list-style-type: none"> Undertake the planning of infrastructure, such as national roads and bridges, flood control, water resources projects and other public works Undertake the design, construction, and maintenance of national roads and bridges, and major flood control systems.
Department of Education (DepEd)	<ul style="list-style-type: none"> Protect and promote the rights of all citizens to quality education at all levels

NGAs	Mandate
	<ul style="list-style-type: none"> • Take appropriate steps to make Such education accessible to all
Local Transport Office (LTO)	<ul style="list-style-type: none"> • Inspection and registration of motor vehicles, issuance of licenses and permits, enforcement of land transportation rules and regulations, and adjudication of traffic cases.
Department of Agrarian Reform (DAR)	<ul style="list-style-type: none"> • To provide Land Tenure security to landless farmers through land acquisition and distribution; leasehold arrangements' implementation and other LTI services. • To provide legal intervention to Agrarian Reform Beneficiaries (ARBS) through adjudication of agrarian cases and agrarian legal assistance. • To implement, facilitate and coordinate the delivery of support services to ARBs through Social Infrastructure and Local Capability Building (SILCAB); Sustainable Agribusiness and Rural Enterprise Development (SARED); and Access Facilitation and Enhancement Services (AFAES).
Department of Transportation (DOTr)	<ul style="list-style-type: none"> • Primary policy, planning, programming, coordinating, implementing and administrative entity of the executive branch of the government on the promotion, development and regulation of a dependable and coordinated network of transportation and communications systems, as well as in the fast, safe, efficient and reliable transportation and communications services.
Bureau of Fire Protection (BFP)	<ul style="list-style-type: none"> • Prevention and suppression of all destructive fires on buildings, houses and other structures, forest, land transportation vehicles and equipment, ships or vessels docked at piers or wharves or anchored in major seaports, petroleum industry installations, plane crashes and other similar incidents, as well as the enforcement of the Fire Code and other related laws. • Power to investigate all causes of fires and, if necessary, file the proper complaints with the city or provincial prosecutor who has jurisdiction over the case.
Philippine Army	<ul style="list-style-type: none"> • interest to the Army on field operations and to increase inter-operability with other major services and international allies. • Train, organize and equip all Army reserve units for the possible expansion of the peacetime Army component to meet any emergency.
Bureau of Jail Management and Penology (BJMP)	<ul style="list-style-type: none"> • Direct, supervise and control the administration and operation of all district, city and municipal jails nationwide with pronged tasks of safekeeping and development of inmates.

NGAs	Mandate
	<ul style="list-style-type: none"> • Formulate policies and guidelines in the administration of all district, city, and municipal jails nationwide. • Implement strong security measures for the control of inmates. • Provide for the basic needs of inmates. • Conduct activities for the development of inmates. • Improve jail facilities • Promote the general welfare and development of personnel.
Philippine Port Authority (PPA)	<ul style="list-style-type: none"> • To establish, develop, regulate, manage and operate a rationalized national port system in support of trade and national development
Commission on Higher Education (CHED)	<ul style="list-style-type: none"> • Promote relevant and quality higher education (i.e. higher education institutions and programs are at par with international standards and graduates and professionals are highly competent and recognized in the international arena).

Source: SIPLAS PAMO, CY 2021

➤ Local Government Units

As the nine (9) municipalities are within the protected area and are members of the SIPLAS PAMB, it is their mandate to engage in SIPLAS' duties for the management of resources and the protection of biodiversity. The Provincial LGU of Surigao del Norte is expected to oversee the implementation of Siargao Area Development Plan and Provincial Framework Plan for Physical Development covering SIPLAS. By allocating an annual budget on its Annual Provincial Investment Programme, the Provincial LGU can provide financial support to the management of SIPLAS.

Meanwhile, municipal LGUs are expected to prepare Comprehensive Development Land Use Plans (CLUP), Annual Investment Plans, Solid Waste Management (SWM) Plans, and Plans for Disaster Risk Reduction and Management (DRRM) under various laws and policies. They must recognize the thrusts and goals of SIPLAS in meeting these requirements and be aware of the protected area management requirements under the NIPAS. A fundamental concern of the LGUs would be the provision of socio-economic services to their constituents, in particular those supporting the production of livelihoods.

➤ **Resource Managers**

They are owners, other than LGUs, delegated or assigned responsibility for the management of particular protected areas. These include Peoples' Organizations (POs) who are PACBRMA holders or administrators of marine protected areas. These POs are directly dependent on the services they have in the region, and this provides them with the opportunity to help protect and manage SIPLAS. Orientation, preparation, exposure, and workshops on the various areas and aspects of PA management will be required for these POs. As part of environmental brigades for the protection, restoration and management of forest and coastal resources, some members are actively engaged. Some POs are active in activities relating national greening program (ENGP), eco-tourism and livelihood enterprises related to the use of natural resources.

The water districts and other water utilities or organizations that rely on water production areas for their supply of water are also among the resource managers. They are expected to protect and maintain their respective water production areas in exchange for the use of water supplies in order to sustain the supply of water. In SIPLAS, four water districts operate and there are a variety of operational Level II facilities. Nevertheless, most of them have yet to completely perform their resource management duties.

➤ **Non-Government Organizations (NGOs), Academic Institutions and Foreign-Assisted Projects**

In the Siargao Islands, there are non-government organization (NGO) that provides social and economic development to the community namely; *Sentro para sa Ikauunlad ng Katutubong Agham at Teknolohiya* (SIKAT), Inc., Sea Movement, STOA, and Sustainable Interventions for Biodiversity, Oceans and Landscapes (SIBOL).

Sentro para sa Ikauunlad ng Katutubong Agham at Teknolohiya (SIKAT) recent activities includes the organization of disadvantaged groups in the Del Carmen coastal communities and the provision of initial training for resources and capacity building. Livelihood projects, such as mudcrab fattening, dried *danggit* development (i.e. *siganids*), are being initiated as a strategy to encourage social enterprises that could wean the community from pursuing non-environmentally friendly livelihood activities, particularly for women (e.g., charcoal making from cut mangroves or forest trees). Del Carmen LGU has also been supported by SIKAT in performing mangrove surveys. It also made it easier for the LGU and selected barangays to prepare the Disaster Risk Mitigation and Climate Change Adaptation Plan.

College education is provided by two educational entities. Bachelor's courses in education, industrial technology, computer engineering and information technology are provided by the Suriago State College of Science and Technology (SSCT) - Del Carmen Campus, which is part of the Surigao State College of Technology (SSCT) in Surigao City. The Siargao Island Institute of Technology (SIIT) has bachelor's degree programs in Office Administration, Criminology, Education, Information Technology and Tourism. These educational institutions will help raise awareness and engage in project monitoring and evaluation. The SSCT-Del Carmen Campus was part of those involved in the Del Carmen mangrove assessment activity and SIPLAS-PAMB Academe representative.

Several special projects are being carried out in the Siargao Islands, including: (a) SCREMP or DENR's Sustainable Coral Reef Ecosystem Management Program; (b) CORVA or DENR's Coral Reef Visualization and Assessment; (c) EcoFish or USAID's Enhanced Ecosystem for Sustainable Fisheries; (d) Climate Change Commission Ecotown; (e) Philippines Climate Change Adaptation Project (PhilCAP); and (e) Fishforever under RARE. The collaboration in Partnership Environmental Protection for East Asian Seas (PEMSEA) has expressed interest in assisting with livelihood-related activities in the area. These programs could provide technical assistance and support for some of the management plan's high-priority tasks.

SIPLAS has been identified as one of the target areas in the Caraga Region by the DENR National Greening Program (NGP), especially for mangrove planting. The introduction of the NGP in 2014 was concentrated in Bucas Grande, especially in the municipality of Socorro. The NGP would be an important source of financing for some of the forestland site growth activities.

➤ **Resource Users**

In SIPLAS, these are all families, organizations, and institutions that can be categorized as consumers of terrestrial, coastal, and marine resources. In particular, they include farmers, fishermen, commercial enterprises, tourism facility/enterprise operators, and visitors. Their principal interest will be to be able to access and enjoy the products and services that SIPLAS ecosystems can offer over the long term.

V. VISION, MISSION, GOALS AND OBJECTIVES

5.1 SIPLAS 10-Year Vision

The following is the vision shared by the key stakeholders of SIPLAS:

“The SIPLAS is envisioned as a protected and resilient paradise with diverse natural habitat, high biodiversity and endemism, picturesque landscape and rich coastal and marine resources, managed collectively by conscious stakeholders capable of sustainable livelihood systems and ecotourism management; and enjoying adequate social services.”

5.2 SIPLAS 10-Year Mission

“To achieve resiliency by enforcing environmental and natural resources laws, rules and regulations; with a common desire for inclusive, balanced and sustainable development of SIPLAS under the framework of good governance and adaptive capacity through the synergistic efforts of nine (9) diverse municipalities, the PAMB and stakeholders.”

5.3 SIPLAS Goals

The SIPLAS has the following four (4) goals to effectively manage the SIPLAS ecosystem thru:

1. Increased in resiliency of SIPLAS ecosystems and its stakeholders, primarily the communities, to threats of disaster and climate change;
2. Sustained the provision of ecosystem goods and services through improved management of terrestrial and coastal and marine resources, particularly of important habitats for biological diversity;
3. Strengthened stakeholder participation in the management of SIPLAS through community empowerment and increased investments of LGUs and the private sector in natural resource management and conservation; and
4. Promote equity among local communities through sustainable livelihoods including community based ecotourism, social services and broader benefit-sharing mechanisms.

5.4 SIPLAS 10-Year Objectives

Ecological

Main Objective:

- To establish and implement conservation measures for terrestrial and coastal and marine areas with high biodiversity and economic values by 2030.

Specific Objectives:

- To implement Ecosystem Based Adaptation (EBA) measures of coastal erosion control versus building of seawalls by 2025.
- To identify, assess and manage Wildlife Sanctuary/Nesting Areas of threatened species within the nine (9) municipalities starting 2021-2030 (1 Wildlife Sanctuary/year);
- By 2030, nine (9) LGUs of SIPLAS implement the environmental policies such as the Unified Fishery Ordinance and Unified Solid Waste Management Ordinance; and
- To implement the Unified Fishery Ordinance in the year 2025.

Socio-Economic

Main Objectives:

- SIPLAS is financially capable and sustainably stable to fund activities for the POs and other stakeholders in 2030.
- The living condition of stakeholders in SIPLAS improved in 2030.
- To seek and access public-private partnership to fund larger projects within SIPLAS by 2030.

Specific Objectives:

- In ten (10) years, SIPLAS IPAF Collection will increase at 90%;
- In two years, implement collection of entrance fees at all entry points of SIPLAS;
- By 2030, 10% of the community in SIPLAS will be involved community based ecotourism projects;
- By 2030, the PA has established linkages to other funding agencies for the support of eco-tourism, agri-tourism, and biodiversity friendly enterprise livelihood projects within SIPLAS;
- To raise awareness of 25% PA stakeholders through CEPA on ecosystem services provided by SIPLAS as a protected area and measured through Knowledge, Attitude and Practices Survey Tool every 5 years; and
- At least 10% increased job opportunities related to tourism and agri-tourism based activities to the local communities in the year 2030.

Governance

Main Objective:

- By implementing 90% of the priority programs, objectives, policies and activities outlined in SIPLAS-PAMB, the effectiveness of SIPLAS shall be significantly improved by 2025.

Specific Objectives:

- To provide at least 95% of the SIPLAS-PAMB and PAMO Personnel with capacity building interventions by 2025;
- To establish unified coordination, monitoring and evaluation, and feedback mechanisms among stakeholders approved by SIPLAS-PAMB by 2022;
- To provide additional funding to SIPLAS for at least five (5) programs under the SIPLAS-PAMB Sustainable Financing Framework by 2025;
- To implement eco-tourism destination management plans in all major tourism destinations of Siargao and Bucas Grande Island by 2022;
- To implement policies on carrying capacity in all major tourism destinations of Siargao Island by 2022;
- Support capability building among stakeholders to share strategies and practices for protecting conservation connectivity through workshops, conference and other appropriate means;
- To support the institutionalization of all MENRO's of the nine municipalities by 2023; and
- To institutionalize SIPLAS PAMO by 2025 and sustain the operation of SIPLAS PAMB.

VI. SIPLAS MANAGEMENT STRATEGIES, INTERVENTIONS AND ACTIVITIES

The SIPLAS' management strategies will be based on the following parameters: management zoning, climate change adaptation, collaborative management, community-based resource management, and sustainable financing.

6.1 Management Zoning

Management zoning is one of the most important strategies that is supported by SIPLAS. The interventions gauge towards managing the environmental and developmental aspects of SIPLAS will be guided by spatially-defined protected area zones. These protected area zones will define the nature and extent of resource use, as well as the resource users who will be permitted in the area. These zones will also determine the policies, enforcement system, institutional support, and resources that the SIPLAS PAMO, LGUs, and other external technical assistance providers must invest in the area.

The SIPLAS' proposed zoning map was created utilizing map overlays. These map overlays were based on criteria that were derived from RA 11038 also known as the Expanded National Integrated Protected Areas System Act of 2018. Thus, the following are categorized as *strict protection zones*:

- a. Natural vegetation or representative of any of the ecosystem types;
- b. Habitats of endemic and threatened species, and biologically important areas, including sites for seasonal feeding, foraging, roosting, nesting, and breeding of wild fauna;
- c. Areas prone to natural and man-made hazards;
- d. Areas set aside as permanent danger zones;
- e. Easements of inland wetlands such as lakes, rivers, creeks, etc;
- f. Class I caves and unclassified caves; and
- g. Areas that require immediate rehabilitation to restore the vegetative cover to its original state.

Meanwhile, the remaining areas outside the strict protection zones have been designated as *multiple use zone*. The following are categorized as *multiple use zone*:

- a. Areas where traditional or sustainable land and water use, including agriculture, agroforestry, aquaculture, and other biodiversity-friendly livelihood activities of local communities;
- b. Areas of high environmental awareness, and recreational/ecotourism or educational values;
- c. Areas of existing and proposed facilities/structures of national significance, such as right of way, waterways, ports, navigational lanes, telecommunications, energy generation, and transmission lines; and
- d. Existing settlements, community centers, and LGUs.

The proposed marine and terrestrial zones within SIPLAS is depicted in Figure 57, each of these zones has its own set of management guidelines, which are outlined below. Likewise, the proposed resource uses/subzones in the Multiple Use Zone (MUZ) by municipality are illustrated in Annex 16.

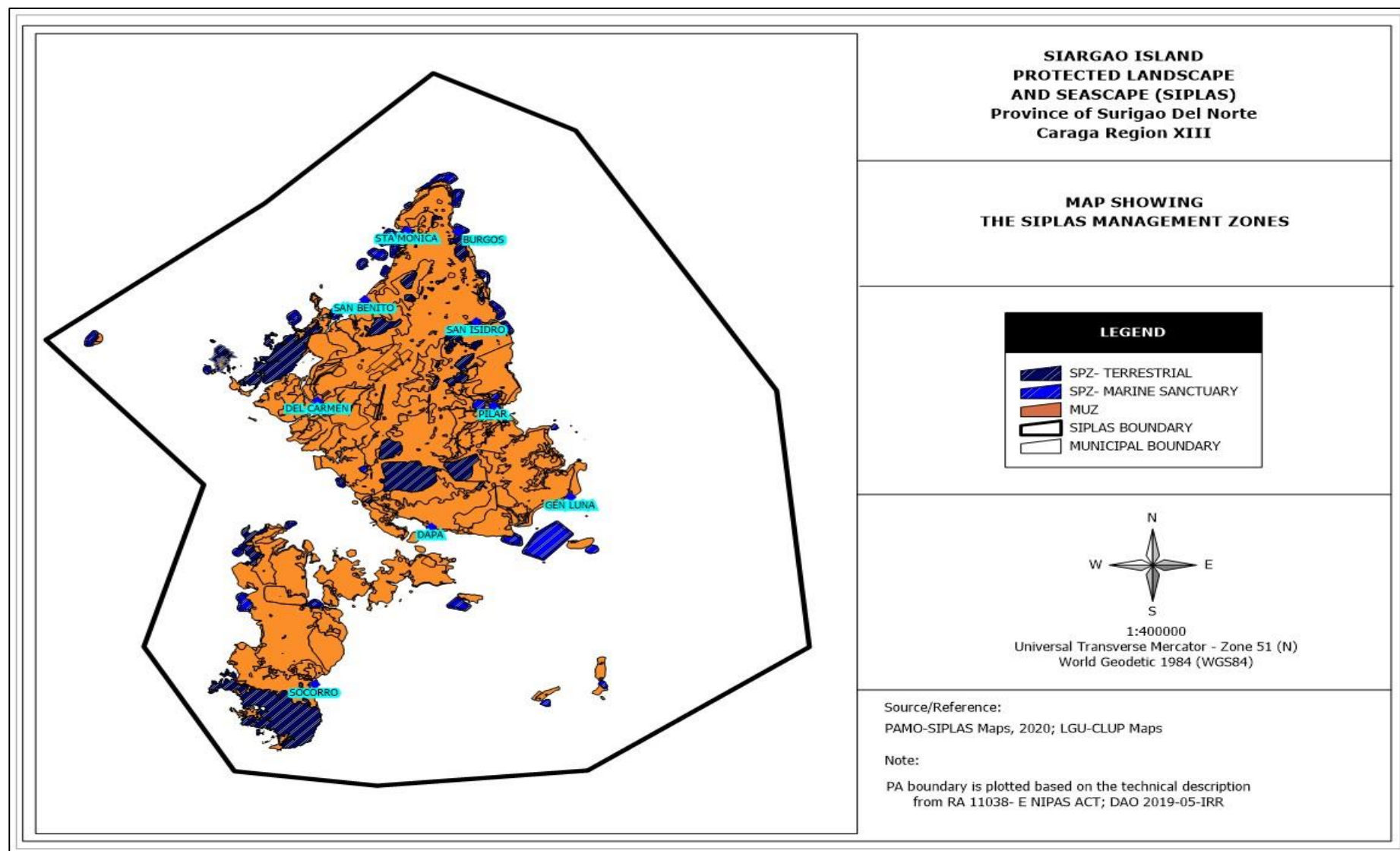


Figure 59. Management Zones for Siargao Islands Protected Landscapes and Seascapes

Source: SIPLAS PAMO, CY 2020

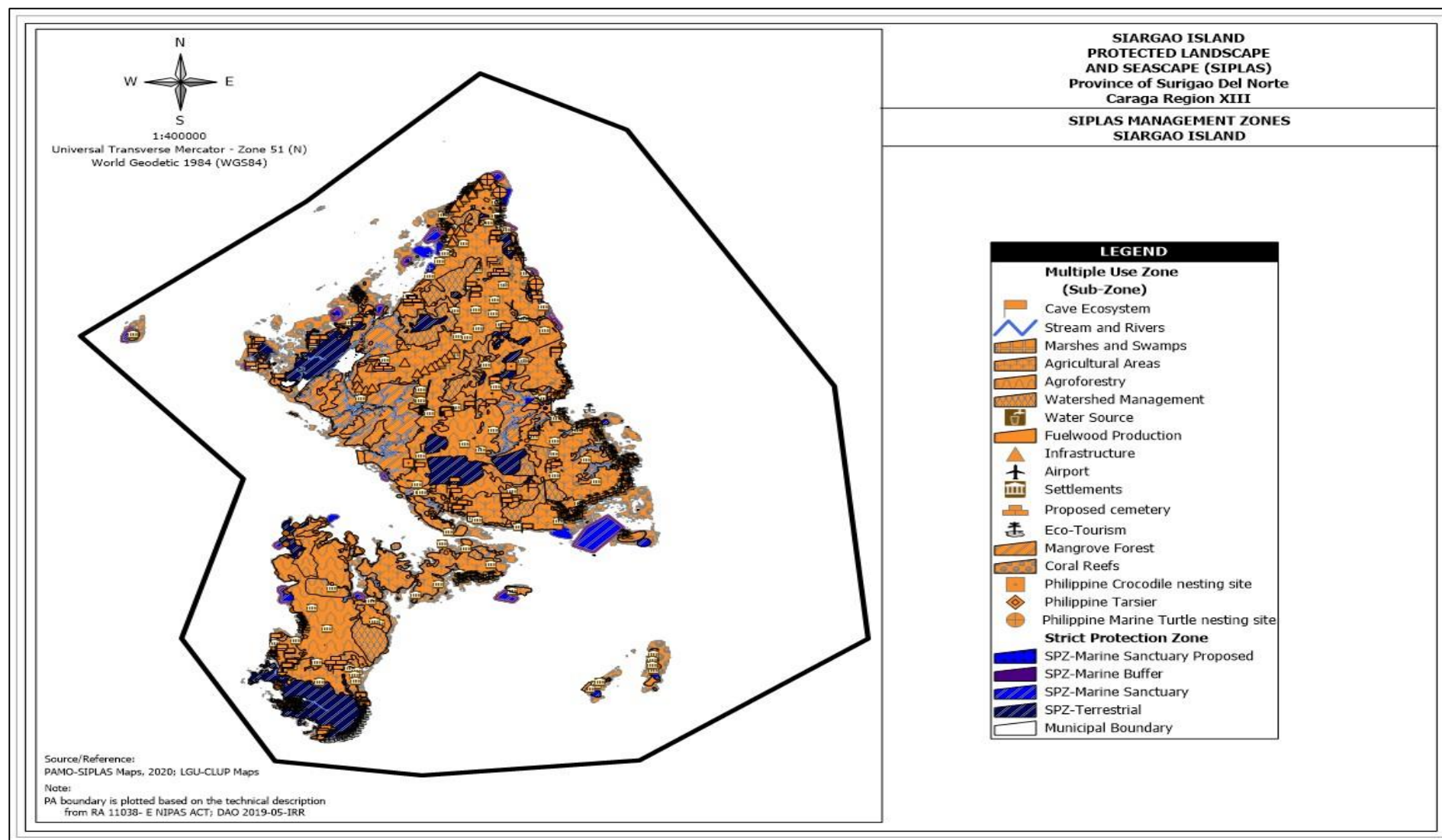


Figure 60. SIPLAS Multiple Use Zone (MUZ) Sub-zones.

Source: SIPLAS PAMO, CY 2020

6.1.1 Terrestrial Management Zone and Prescriptions

The details below are the management prescriptions for the terrestrial management zones. Meanwhile, Table 72 presents the coverage of the management zone for the terrestrial area of SIPLAS.

Table 72. Management Zones cover within SIPLAS Terrestrial Area

Ecosystem	Management Zones	Covered Area (in hectares)
Terrestrial	Strict Protection Zone	7,326
	Multiple Use Zone	55,470
Total		62,796

Source: SIPLAS PAMO, CY 2020

6.1.1.a. Terrestrial Strict Protection Zone (SPZ)

The Strict Protection Zones of SIPLAS, particularly in terrestrial areas includes the following:

- Natural vegetation or representative of any of the ecosystem types;
- Habitats of endemic and threatened species, and biologically important areas, including sites for seasonal feeding, foraging, roosting, nesting, and breeding of wild fauna;
- Areas prone to natural and man-made hazards;
- Areas set aside as permanent danger zones;
- Easements of inland wetlands such as lakes, rivers, creeks, etc.;
- Class I caves and unclassified caves; and
- Areas that require immediate rehabilitation to restore the vegetative cover to its original state.

General Management prescriptions:

- This is designated to be strictly a no-take core zone;
- Only PAMB-approved non-extractive, non-manipulative, non-disruptive biophysical monitoring, patrolling and surveillance activities and scientific research are allowed;
- Allowed rehabilitation projects such enrichment planting of indigenous species and bamboo plantation;
- Establishment of station markers, monuments, signage boards, and other structures that serve as delineation boundary of the core zone are allowed;
- Strictly no constructing, erecting or maintaining any kind of structures within the identified core zones;
- No development shall be established in all existing roads within SPZ;
- Strictly no hunting, taking, collecting timber, or possessing of any wildlife, or by-products within the closed forest areas and critical habitats without permits, authorization or exemption;
- Strict Protection Zone will be properly demarcated with markers and signage; and
- Introduction of exotic species is strictly prohibited.

Specific management prescriptions within the terrestrial strict protection zones in SIPLAS are as follows:

Ultramafic Forest and Hilltop Ridge Area

This includes the intact forested areas of Brgy. Salog and Brgy. Sering in Socorro; Sitio Lobo Brgy. 12 of Dapa; Brgy. Bongdo, Brgy. Nuevo Campo, and hilltop ridges of Brgy. Maribojoc of San Benito; Brgy. Mahayahay, Del Carmen; Brgy. San Roque and Maasin of Pilar; Brgy. Mabini and Libertad of Sta. Monica; hilltop ridge area of Burgos, and San Isidro; and Brgy. Consuelo of General Luna.

- This include the natural vegetation or representative of any of the ecosystems such as closed forests and secondary forests;
- Serve as harbor area for endemic and threatened species, and biologically important areas, including sites for seasonal feeding, foraging, roosting, nesting, and breeding of wild fauna;
- Strictly no poaching, killing, destroying, disturbing of any wildlife thriving within the habitat;
- Construction of permanent establishments for development is strictly prohibited;
- In Socorro, no settlements will be allowed on both sides of the existing road traversing the strict protection zone;
- Research studies are allowed with the supporting Gratuitous Permit (GP) and endorsement by the PAMB and LGU; and
- Reforestation projects and programs are allowed in the area with PAMB endorsements.

Nesting Sites

This includes the core zones of nesting site/habitats of critically endangered species, to wit:

Species	Location
Civet Cat	Brgy. San Mateo of Burgos; Brgy. Sta. Fe, Sitio Lobo and Brgy. Osmeña of Dapa; Mahayahay of Del Carmen
Tarictic Hornbill	Brgy. San Mateo of Burgos; Brgy. Sta. Fe and Osmeña of Dapa; Brgy. Mahayahay and Brgy. Caub of Del Carmen; Brgy. Bongdo and Brgy. Maribojoc of San Benito; Brgy. Salog and Sohoton Cove of Socorro; and Brgy. San Miguel, San Isidro
Rufous Hornbill	Brgy. Sta. Fe and Osmeña of Dapa; Brgy. Jaboy, Maasin, and Mabuhay of Pilar; Brgy. Mahayahay and Brgy. Caub of Del Carmen; Brgy. Bongdo and Brgy. Maribojoc of San Benito; Brgy. Salog and Sohoton Cove of Socorro; and Brgy. San Miguel, San Isidro
Philippine Tarsier	Brgy. San Mateo of Burgos; Brgy. Sta. Fe and Osmeña of Dapa; Brgy. T. Arlan of Sta. Monica; Brgy. Katipunan, Del Carmen; Brgy. San Miguel of San Isidro; Brgy. Salog, Socorro
Flying Lemur	Brgy. Sta. Fe and Osmeña of Dapa; Brgy. San Mateo, Burgos; Brgy. Mahayahay of Del Carmen; Brgy. Bongdo of San Benito; Brgy. Salog and Sohoton Cove of Socorro
Flying Foxes	Brgy. Don Paulino and Sitio Lobo of Dapa; Brgy. San Miguel, San Isidro; and Brgy. Mahayahay, Del Carmen

Species	Location
Midanao Squirrel	Brgy. San Mateo of Burgos; Brgy. Don Paulino and Sitio Lobo of Dapa; Brgy. Bongdo of San Benito; Brgy. Salog of Socorro; and Brgy. San Miguel, San Isidro
Wild Duck	Marsh areas such as Brgy. San Miguel, San Isidro; Brgy. San Mateo, Burgos, Paghungawan Marsh of Jaboy, Pilar; marshes of Brgy. Osmeña, Dapa and mangrove forest areas in Del Carmen.

- Identified as harbor area for important indicator species such as Rufous Hornbills, Tarictic Hornbills, White Breasted Sea Eagles and Tarsiers and biologically important areas, including sites for seasonal feeding, foraging, roosting, nesting, and breeding of wild fauna;
- Strictly no poaching, killing, destroying, disturbing of any wildlife thriving within the habitat;
- Construction of permanent establishments is strictly prohibited;
- Establishment of station markers, monuments, signage boards and other structures that serve as delineation boundary of the core zone; and
- Potential areas for presence of Philippine Tarsier, Mindanao squirrel, civet cat, Rufous Hornbill, Tarictic Hornbill, wild duck are for further assessment and for establishment as nesting sites or wildlife sanctuary.

Watershed Conservation

The strict protection zone comprises the core zones of the identified watershed conservation areas such as the declared and proposed watershed and parcel areas in:

1. Poblacion 2, Burgos;
2. Brgy. Jamoyaon and Brgy. Mahayahay of Del Carmen;
3. Brgy. Malinao, Brgy. Consuelo, and Brgy. Corazon of General Luna;
4. Brgy. San Roque, Brgy. Datu and Brgy. Mabini of Pilar;
5. Brgy. Bongdo, Brgy. Nuevo Campo, Brgy. Talisay, Brgy. Sta. Cruz, and Brgy. San Juan of San Benito
6. Brgy Roxas, Brgy Macapagal, Brgy Sto. Nino & Brgy Sta Paz of San Isidro;
7. Brgy. Abad Santos, Brgy. Libertad, Brgy. Magsaysay, Brgy. Mabuhay, Brgy. Rizal and Brgy. Garcia of Sta. Monica; and
8. Brgy. Rizal and Brgy. Sering of Socorro

The following are the management prescriptions:

- Serve as major source of potable water in main Siargao Island and Bucas Grande island;
- Reforestation projects using the indigenous tree species and bamboo plantation are allowed to enhance the water sources of the island;
- Enforcement activities such as patrolling and surveillance are allowed in the area;
- Cutting/ harvesting of natural grown trees is not allowed;
- All agricultural activities including poultry farming and coconut plantation is strictly prohibited;
- No new plantation of coconut and agricultural crops;
- Planting of exotic species and coconut trees are strictly prohibited; and
- Updating of watershed management plan will be prioritized.

Caves

This includes the caves that are classified as Class I and the one hundred sixty-six (166) unclassified caves as per inventory conducted last CY 2019 and 2020. The following are the management prescriptions for these caves under the SPZ:

- Caves that are classified as Class 1 which defines the area with delicate and fragile geological formations, threatened species, archeological and paleontological values, and extremely hazardous conditions;
- Unclassified caves also included as strict protection zone. However, these will be converted to Multiple Use Zone for ecotourism activities once it is assessed and classified as Class II and Class III caves;
- Allowable activities are limited to mapping, assessment, photography for publication, educational and scientific purposes.;
- Establishment of permanent infrastructures for enterprises are strictly prohibited;
- Touching of stalactites and stalagmites inside in the cave is strictly prohibited; and
- Collecting and gathering of bird's nest within the caves is strictly prohibited.

Marshlands

This includes the core zone of Paghungawan Marsh in Brgy. Jaboy, Pilar and portion/area in Brgy. San Miguel of San Isidro which is a confirmed habitat of Philippine Tarsier. The management prescriptions for these area includes the following:

- In Paghungawan Marsh, Jaboy, Pilar, the marshlands will have a core zone/strict protection zone which serve as Philippine crocodile habitat/nesting site but with buffer areas for eco-tourism where boating may be permitted;
- Conservation projects such as reforestation and biodiversity projects are allowed in the area with the endorsement by the PAMB; and
- No reclamation and resettlement within the area.

6.1.1.b. Terrestrial Multiple Use Zone (MUZ)

Areas intended as a Multiple Use Zone shall take into account the location of the following:

1. Areas where traditional or sustainable land and water use, including agriculture, agroforestry, aquaculture and ecotourism;
2. Areas of high environmental awareness, and recreational/ecotourism or education values;
3. Areas of existing and proposed facilities/structures of national significance, such as rights of way, waterways, ports, navigational lanes, telecommunications, energy generation, and transmission lines; and
4. Existing settlements, community centers, and LGUs.

General Management Prescriptions:

- All existing activities and developments should conform with protected area conservation principles, policies and guidelines;
- Use of resources in MUZ will be strictly regulated and monitored following this Management Plan and PAMB Resolutions;
- Activities should not disturb or lead to deterioration of natural resources and ecosystems specially the endangered and vulnerable species and ecosystems;
- Only sustainable food production activities and technologies will be allowed in the area;
- Only physical development activities with Environmental Compliance Certificates, Memorandum Agreements, PACBRMA and SAPA with PAMB endorsement will be allowed in this zone;
- Establishment of fuel wood production areas/productive reforestation will be allowed but shall follow prescriptions indicated in this plan;
- Establishment of relocation sites to meet need in times of adverse weather events will be allowed but shall follow prescriptions indicated in this plan;
- Quarry activities within the area are not allowed per RA 11038;
- No dumping, throwing, using or causing to be dumped into or placed including private lands in the protected area of any toxic chemical, noxious or poisonous substance or non- biodegradable material, untreated sewage or animal waste products or products whether liquid, solid or gas state, including pesticides and other hazardous substance per RA 9003;
- Specific management plans will be developed by tenure holders and other designated resource managers for each of the identified land and water use sub-zones within the multiple use zone;
- Conformity with the CLUP and Zoning Ordinance; and
- All protected area-wide policies will apply to this management zone.

Specific management prescriptions for particular land uses within the Multiple Use Zones are as follows:

Community Watershed areas:

Composed of water sources adjacent to the community located at Poblacion 1 of Burgos; Brgy. Corazon and Brgy. Tawin-Tawin of General Luna; Brgy. Sta. Cruz, San Benito, Brgy. Garcia, Sta. Monica; Brgy. Tigasao of San Isidro; and Brgy. San Roque of Socorro. This zone also encompasses the buffer zones of the Watershed Conservation Areas under the SPZ. The management prescriptions of these areas are as follows:

- Cutting/ harvesting of trees is not allowed;
- Rehabilitation of degraded areas using indigenous species of trees and fruit trees are allowed;
- Bamboo plantation is encouraged;
- New settlements will not be permitted;
- Use of pesticides and inorganic fertilizers will be gradually phased out;
- Burning as a farming practice will not be allowed;
- Agroforestry and soil and water conservation measures will be adopted in cultivated areas;
- Exotic species shall be prohibited i.e. Mangium, Gemelina and Falcata;
- For Sta. Monica, drilling water system will be considered and secure appropriate permits and clearances;
- Other municipal water use purposes for utilization of water for supplying the water requirements of a community of which being the national government, its subsidiary agencies, local government units, private persons, cooperatives or corporations shall follow the requirements per PD 1067-Water Code and endorsement by the PAMB;
- A watershed management plan will be prepared and updated for each identified water conservation area;
- For Alienable and Disposable claimant, will be done through MOA;
- Recreational activities will be allowed after the 40m easement per DAO 2021-07;
- Structures allowed include reservoir and in-take box;
- Destructive development projects are strictly prohibited; and
- All development projects are subject to EIA.

Caves

Caves within MUZ includes the fourteen (14) classified caves, to wit:

Cave Location		Name of Cave	Classification
Municipality	Barangay		
Burgos	Poblacion 1	Somyot Cave	II
	Poblacion 2	Ilihan Cave	II
	Poblacion 2	Patag Cave	II
Del Carmen	Caub	Caub Cave	II
Pilar	Datu	Tayangban Cave	II
Sta. Monica	Libertad	Guano Cave	III
	Tangbo	Danjug Cave	III
	Libertad Cave 2	Libertad Cave 2	II
	Sta. Cruz	Crystal Cave	II

Cave Location		Name of Cave	Classification
Municipality	Barangay		
Socorro	Sta. Cruz	Bolitas Cave	II
	Sta. Cruz	Tondan Cave	II
	Sta. Cruz	Spaghetti Cave	II
	Sudlon	Hagukan Cave	II
	Sudlon	Magkukuob Cave	II

Source: SIPLAS PAMO, CY 2020

The management prescriptions of caves under MUZ are as follows:

- Caves that will be classified as Class II and Class III in the future will be under MUZ;
- Caves that are classified as Class II and Class III based on the assessment results pursuant to DMC 2007-04 are only allowed for ecotourism activities;
- Caves that are identified as Class II defines portions which is strictly prohibited due to the hazardous conditions and contain sensitive geological, archaeological, cultural, historical, and biological values or high quality ecosystem which is open to the experienced cavers or guided educational tours and visitors. It may be necessary to close sections of these caves seasonally or permanently. It is open to experienced cavers or guided educational tours and visits;
- For caves that are classified as class III are open for safe to inexperienced visitors with no known threatened species and archaeological, geological, natural history, cultural and historical values. These caves may also be utilized for economic purposes such as guano extraction and edible birds nest collection;
- For the developed cave, such as Danjug Cave in Sta. Monica, additional structures are not allowed. The remaining undisturbed areas will serve as harbor and nesting sites of the important cave species; and
- The classified caves shall have an approved five (5)-year management plan with SIPLAS-PAMB endorsement.

Terrestrial Ecotourism Sites

Terrestrial ecotourism sites encompass ecotourism sites and destinations located in the hills, marshlands, lakes, rivers, and other upland areas. This includes the following ecotourism sites, to wit;

Municipality	Ecotourism sites and location
Burgos	<ul style="list-style-type: none"> • “Sakahan” of Brgy. Bitaug and other top-ridge view; • Somyot Cave; • Patag Cave; and • Potential Cave II and III
Dapa	<ul style="list-style-type: none"> • “Pungkay View” of Brgy. Union; • Proposed Golf Course of Brgy. San Miguel; • Alimbungog of Brgy. San Carlos; • Little Batanes in Brgy. Corregidor; • Laksuhon Cave in Brgy. Don Paulino; • Bats watching in Brgy. Don Paulino and Brgy. Osmeña; and

	<ul style="list-style-type: none"> • Other top-ridge view
Del Carmen	<ul style="list-style-type: none"> • Siargao Peak View at Brgy. Mahayahay (for review in TWG), and • Other top-ridge view
General Luna	<ul style="list-style-type: none"> • Consuelo Cave and Water Park in Brgy. Consuelo, • Proposed Golf Course in Brgy. Catangnan, and • Other top-ridge view
Pilar	<ul style="list-style-type: none"> • Beto of Brgy. Katipunan, • Tayangban Cave of Brgy. Datu, • Portion of Paghungawan Marsh of Brgy. Jaboy, • San Roque Rock of Brgy. San Roque, • Maasin River of Brgy. Maasin, • Maasin Coconut View, and • Other top-ridge view
San Benito	<ul style="list-style-type: none"> • Guyangan Nature Pool of Brgy. Bongdo, • Poneas Lake of Brgy. Maribojoc, • Aerial Zip-line from Sitio Butong to Litalit Island and other top-ridge view
San Isidro	<ul style="list-style-type: none"> • Buhing Kalipay Water Pool of Brgy. Buhing Kalipay, • San Isidro Ecotourism River which traverse Brgy. Del Carmen, Sitio Bangon and Sitio Bayatakan of San Isidro, and • Agong-Agong Cave of Brgy. Pacifico, and other top-ridge view
Socorro	<ul style="list-style-type: none"> • Ecotourism River of Brgy. Rizal, • Busay of Brgy. Salog, • Caves of Brgy. San Roque and Brgy. Sudlon, • Sohoton Cove, and • Pungkay view of Brgy. Rizal and other top-ridge view
Sta. Monica	<ul style="list-style-type: none"> • Proposed ecotourism of Brgy. Garcia and Brgy. T. Arlan, Bito of Brgy. Libertad, and View Deck of Brgy. Mabuhay, and other top-ridge view • Taktak Falls • Cave classified as Cave II and III

The management prescriptions of these ecotourism sites and destinations under MUZ are the following:

- Community-based eco-tourism will be promoted;
- Activities should not disturb or lead to deterioration of natural resources and ecosystems specially the endangered and vulnerable species and ecosystems;
- Cutting of natural grown trees will not be allowed;
- Proper ecological solid waste management should be an integral part of any eco-tourism and tourism program/project;
- Limited structures may be allowed in mangrove areas such as board walk, view deck and guard house. Floating sheds (built from indigenous materials from legal sources) with capacity of 5-10 persons may be allowed in designated areas. These however should not obstruct navigational lanes;
- All structure designs including billboards and signage shall follow on the prescribed standard and designs per DAO 2009-09;

- No structures will be allowed within 20 meters from shore line; 20 meters in agricultural lands and 3 meters from river banks in urban areas; 40 meters from timberland;
- Number of tourists must be followed based on the Carrying Capacity research study; and
- Site specific eco-tourism plan shall be developed in coordination with the provincial and municipal tourism office.

Forest Plantations (Fuelwood and Woodlots)

This includes the proposed and identified fuelwood production areas located at Brgy. Jubang and Brgy. Sta. Fe of Dapa; Brgy. Quezon of Del Carmen; Brgy. Cabitoonan of General Luna; Brgy Mabini and Brgy. Datu of Pilar; Brgy. San Juan and Brgy. Sta. Cruz of San Benito; and PACBRMA areas. The following are the management prescriptions of these areas:

- Indigenous species will be promoted and the use of exotic species is discouraged;
- Firewood species will be promoted for plantation;
- Bamboo plantation is encouraged;
- Selective cutting/compartamental harvesting of planted trees will be promoted;
- Use of pesticide and inorganic fertilizers will be discouraged;
- In General Luna, fuelwood area is within A&D area. Partnership with the owner and LGU will be secured; and
- Management plan for these community-based fuelwood plantations shall be developed.

Agroforestry

These comprise the agroforestry areas of the nine (9) municipalities of Siargao and Bucas Grande Islands.

- Planting of fuelwood species along boundaries of individual farms will be encouraged;
- Tree components should be limited to indigenous species;
- In developed coconut plantations, inter-planting of coffee, cacao, and other fruit trees and other high valued crops will be encouraged;
- Use of organic fertilizers will be promoted;
- Soil and Water Conservation (SWC) measures will be integrated into the farming system; and
- Farmer cooperators within timberland will be organized into PO's and provided with secured land tenure such as PACBRMA; the PO may issue agreements with individual farmers covering their agroforestry area.

Agricultural Areas

The agricultural areas under MUZ covers about 39,877 hectares within the nine (9) municipalities of Siargao and Bucas Grande Islands which composes 64% of the total land area of SIPLAS. The management prescriptions include the following:

- Use of organic fertilizers will be promoted;
- Intensive Communication, Education, and Public Awareness (CEPA) campaign will be undertaken to promote gradual shift to organic farming;
- Integrated pest management will be promoted;
- Plantation of traditional rice varieties is encouraged and promoted for instance in Sta. Monica.

Settlements/ Commercial Areas

These areas encompass all the built-up areas, existing settlements, community centers and LGUs of all the barangays and municipalities of Siargao and Bucas Grande Islands. The management prescriptions include the following:

- Structures should be consistent with the building code (including the correct design and construction of septic tanks) and related LGU ordinances;
- Use of sanitary toilet facilities with three to four chamber shall be promoted;
- Design of the establishments and infrastructures shall follow DAO 2009-09;
- Three-storey establishments structures with maximum height of 10 meters are allowed;
- Five (5) storey establishments to be referred to PAMB for policy formulation with due consideration on the existing requirement of 10 meters maximum height of the building;
- Settlements and commercial related projects not indicated in the plan shall be subject to PAMB approval; and
- Sewage treatment facilities are allowed subject to full blown EIA.

Marshlands/Lake

Covers the marshland areas in Brgy. Baybay, Brgy. Matin-ao and Brgy. San Mateo of Burgos; Brgy. Consuelo of General Luna; Brgy. Jaboy of Pilar; and Sitio Bulacan, Sitio Bayatakan, Brgy. San Miguel, Brgy. Pacifico, Brgy. Roxas and Brgy. Tigasao of San Isidro. Poneas lake of San Benito and Mabuhay Lake of Pilar are also included in this zone.

- May be used for ecotourism and biodiversity conservation initiatives;
- Environmental friendly recreational facilities are allowed;
- No infrastructures established within marshland/lake except watchtowers and concrete stilt boardwalks for patrolling purposes;
- Agricultural activities are allowed in Burgos marshlands;
- Construction of drainage canal and riprap is allowed in San Mateo, Binukgan going to Matin-ao to San Isidro River;
- Marshes in San Miguel, San Isidro shall serve for aquaculture activities. Non-permanent infrastructure in support to eco-tourism shall be allowed i.e. hanging bridge, foot path and watch tower; and
- San Isidro River eco-tourism activities shall be allowed.
- Floating cottages using light wood material is allowed in Poneas Lake, San Benito;
- For Mabini, Sta. Monica, establishment of flood control canal/projects are allowed with the endorsement of the SIPLAS PAMB;
- In San Mateo Marsh of Burgos, ecotourism activities are allowed per approved 5-year Wetland Management Plan;
- Establishment of Portable Comfort Rooms in Poneas Lake particularly located at the entrance; and
- For Dapa, respect judicial awards within the marshlands/wetlands.

River

This covers the Maasin River of Brgy. Maasin, Pilar; San Isidro River of Brgy. Del Carmen, San Isidro; and Salog River and Ecotourism River of Brgy. Rizal, Socorro.

- River protection infrastructure projects serve as wall protection are allowed with the following supporting documents such as EIA, site development plans, and other conditions based on the DAO 2019-05;
- Recreational activities in Maasin River, Pilar and San Isidro river and other suitable areas are allowed;
- Installation of signage following the standard design per DAO 2009-09;
- For San Isidro river, installation of lighting within the settlements are allowed;
- Construction of watch tower and concrete stilt boardwalk in Brgy. Tigasao Marshland for birdwatching and monitoring;
- Aquaculture livelihood are allowed with the prescribed regulations based on BFAR;
- Floating towed restaurants made of light materials are allowed with restrictions such as proper waste disposal (San Isidro, San Roque Rock Diving and Maasin River, Pilar);
- Floating towed cottages made of light materials are allowed in Brgy. Katipunan and San Roque, Pilar;
- Wharf and docking stations for pumpboats are allowed in the designated areas;
- For San Isidro river, dredging shall be allowed for navigational passageways;
- No Reclamation/fill-in in the area.

Sanitary Landfill Areas

This refers to the proposed sanitary landfill areas in SIPLAS. Set guidelines and targets for solid waste avoidance and volume reduction through source reduction and waste minimization measures, including composting, recycling, re-use, recovery, and others, before collection, treatment and disposal in appropriate and environmentally sound solid waste management facilities in accordance with RA 9003 also known as Solid Waste Management Act.

- Segregation and collection of solid waste shall be conducted at the barangay level specifically for biodegradable, compostable and reusable wastes;
- Segregation at source, recycling, resource recovery, including waste-to-energy generation, re-use and composting;
- The collection of non-recyclable materials and special wastes shall be the responsibility of the municipality;
- Materials recovery facility is required which include solid waste transfer station or sorting station, drop-off center, a composting facility, and a recycling facility. The material recovery facility shall be established in a barangay-owned or leased land or any suitable open space to be determined by the barangay through its *Sanggunian*;
- Practical applications of environmentally sound techniques of waste minimization such as but not limited to resource conservation;
- Recycling programs for the recyclable materials such as but not limited to glass, paper, plastic and metal are allowed;
- All municipalities, through its local solid waste management boards, shall prepare its respective 10-year solid waste management plans consistent with the National Solid Waste Management Framework;
- No open dumps shall be established and operated, nor any practice or disposal of solid waste by any person including LGUs as per RA 9003; and
- Other criteria in sanitary landfill such as segregation of wastes, collection and transport of solid waste, inventory of existing markets for recyclable materials, siting of sanitary landfills, operating criteria for sanitary landfills, establishment of common waste treatment and disposal facilities shall follow based on RA 9003 (Solid Waste Management Act).

Relocation Sites

These includes the MUZ of the nine (9) municipalities of Siargao and Bucas Grande Islands.

- Relocation site must be within the timberland and Alienable and Disposable areas;
- The actual land-use/resource uses of the area must be in accordance with the SIPLAS-PAMP Management Zones such as Agricultural, Agroforestry, Settlement, and Fuel wood production;
- Site must be identified as low vulnerability to landslides and flood hazards;
- Accessibility to basic services such as safe drinking water, basic sanitation and hygiene facilities, essential health care, education, energy, basic mobility and support facilities and other social and social welfare services;
- Any infrastructure must integrate harmoniously with the natural and cultural environment. The natural contour of the landscape should not be significantly altered in the design of any infrastructure;
- Flooring of vertical infrastructure shall be of suspended type and style, elevated by at least one (1) meter from the ground, for flat areas. The flooring shall adjust to the

contour in the case of sloping ground. There shall be no alteration of ground contour to accommodate floors of structures on sloping ground;

- Major facilities should be placed only in appropriate management areas prescribed by the management plan and after consideration of carrying capacities;
- Construction of high structures should be avoided. The maximum height of any building or structure shall be ten (10) meters from the Natural Ground Line (NGL) to the roof top or highest part of the building/structure. Said structure should not interfere with the profile of the landscape;
- Excavation of septic tank, foundation/footings, compost pit and the like shall be limited to a maximum depth of three (3) meters below NGL;
- Basic facilities are allowed to meet the needs of the community but these structures should be designed in such a way that they are environmentally sensitive, practical and sustainable;
- Potential for livelihood opportunities;
- Materials recovery facility is required which include solid waste transfer station or sorting station, drop-off center, a composting facility, and a recycling facility.
- Conduct biodiversity assessment and geo-hazard assessment in the site
- Issue appropriate tenurial instruments;
- The PASu shall conduct periodic monitoring and evaluation in coordination with PENRO SDN, and concerned stakeholders and shall submit reports to the Office of the RED for proper action.

Other Special Use Areas

Covers the area of existing and proposed cell sites and other renewable energy facilities to be installed within SIPLAS.

- Allowable activities include cell site establishment, and wind mill, solar and other renewable energy facilities with the agreement through Special-Use Agreement in Protected Area (SAPA) plus Environmental Impact Assessment (EIA); and
- Cell site establishment not allowed in SPZ.

6.1.2 Coastal and Marine Management Zone and Prescriptions

The details below are the management prescriptions for the coastal and marine management zones. Meanwhile, the total area for this zone covering the SPZ and MUZ is shown in Table 73.

Details on coastal zoning will be integrated after the finalization of the coastal zoning of the nine (9) municipalities facilitated by Rare Philippines. In particular, defined in this management plan is the zoning on marine turtle nesting sites, mangrove areas and marine sanctuaries.

Table 73. Area of Coastal and Marine Management Zone

Ecosystem	Management Zones	Area (in has)
Coastal and Marine	Strict Protection Zone	12,024.35
	Multiple Use Zone	215,272.42
Total		227,296.77

Source: SIPLAS PAMO, CY 2020

Strict Protection Zone

This consists of the patches of coral reefs with high percentage of coral cover (i.e., >20% live hard coral cover) ideally with a minimum fish biomass level of 15mt/km². Other areas that can be considered part of this management zone are the established marine protected areas, critical habitats within mangroves, beach areas and seagrass beds. Coastal habitats in municipalities of Burgos, Dapa, San Isidro, San Benito, Pilar, Burgos, Santa Monica, Socorro and General Luna.

General Management prescriptions:

- Only PAMB-approved non-extractive, non-manipulative, non-disruptive biophysical monitoring, patrolling and surveillance activities and scientific research are allowed in these core zones.

Specific management prescriptions within the coastal and marine strict protection zones are as follows:

Mangrove Reserved Area

This includes the intact mangrove forests located in Brgy. Asinan-Dayaoahay and Brgy. Pilaring of the municipality of Pilar; NGP mangrove rehabilitation sites in Brgy. Libertad, Cabitoonan, Malinao, Tawin-Tawin and Catangnan of General Luna; NGP mangrove rehabilitation sites and compact mangrove forest in Del Carmen, and the eight (8) remaining mangrove trees in Brgy. Baybay, Burgos, SDN.

- These mangrove reserves shall serve as closed intact mangrove forest with no human activities;
- Mangrove plantation projects are allowed in the area;
- Strictly no permanent structures will be allowed in the mangrove reserved area; and
- No reclamation/fill-in are allowed within the mangrove reserved area.

Nesting and Foraging Sites in Protected Areas

This includes the area identified as breeding/foraging sites of the identified threatened species in the following municipalities:

Municipality	Site/Barangay
Burgos	Marine turtle nesting sites located in Brgy. Baybay specifically in “Mag-aso” and “Pagbasicon” beach
Dapa	Marine turtle nesting sites in the identified beach area in Brgy. Union Sitio Talisay and Brgy. Corregidor
Del Carmen	Mangrove areas that serve as Saltwater Crocodile nesting sites and other endemic species
General Luna	Marine turtle nesting sites in Brgy. Catanganan, Brgy. Daku and Guyam Islet; Seacow foraging area between Daku Island and Brgy. Malinao.
Pilar	Marine turtles nesting site in Brgy Caridad and Magpupungko beach area
San Benito	Seacow foraging area in the southern part of Kambiling Naked Island, Nesting site of Saltwater Crocodile in Bongdo
Sta. Monica	Marine turtle nesting sites in the identified beach area in Brgy. Alegria, Brgy. Garcia, Brgy. Rizal and Tangbo
Socorro	Saltwater crocodile nesting site in the identified mangrove areas in Brgy. San Roque

Source: PAMO SIPLAS Public Consultation, CY 2020

The management prescriptions of Nesting and Foraging sites in Protected Areas under SPZ are the following:

- Permanent structures within the zone are strictly prohibited. A 40-meter easement shall be strictly employed in beaches;
- Collecting, poaching and killing of wildlife is strictly prohibited;
- Research studies and other biophysical assessments are allowed with the PAMB clearance/endorsement;
- Research studies that involve collection of specimens are allowed with Gratuitous Permit; and
- Planting of beach forests species is encouraged.

Marine Sanctuary

This includes the Marine Sanctuaries identified in the entire SIPLAS as follows:

Municipality	Barangay/s
Burgos	<ul style="list-style-type: none">• Brgy. Poblacion 1 & 2 [Lakyaon MPA (increased the core zone to 50 hectares) proposed to be expanded seaward]• Brgy. Baybay (proposed MPA)
Dapa	<ul style="list-style-type: none">• Union (Proposed)• Corregidor (Existing)• Buenavista (Proposed)
Del Carmen	<ul style="list-style-type: none">• Halian (Existing)

Municipality	Barangay/s
	<ul style="list-style-type: none"> • Caub (Existing) • San Fernando (Existing) • Cabugao (Proposed)
General Luna	<ul style="list-style-type: none"> • General Luna MPA (Existing) • Daku (Proposed) • Suyangan (Proposed) • Anajawan (Proposed) • Cloud 9 (Brgy. Catangnan) (Proposed)
Pilar	<ul style="list-style-type: none"> • Salvacion (Existing) • Pilar MPA (Centro-Punta-Asinan-Pilaring) (Existing)
San Benito	<ul style="list-style-type: none"> • Pagbasayan Islet • Talisay (Existing) • Maribojoc (Existing)
San Isidro	<ul style="list-style-type: none"> • Tigasao (extended up to the mouth of the river) • Pacifico (half of the MPA will be under SPZ) other half is for surfing area (Proposed)
Socorro	<ul style="list-style-type: none"> • Pamosaingan-Kanlanuk (Existing) • Sta. Cruz (Existing) • Doña Helene (Existing) • Sering (Existing) • Salog (Existing)
Sta. Monica	<ul style="list-style-type: none"> • Rizal (Existing) • T.Arlan (Existing) • Magsaysay (Proposed) • Abad Santos (Proposed) • Tangbo- (Existing) • Alegria-(Existing)

Source: PAMO SIPLAS Public Consultation, CY 2020

The following are the management prescriptions:

- These areas serve as preservation area comprises with high diverse marine resources, breeding area and ecosystems which includes high live hard corals, seagrass beds and mangrove forests. This shall strictly “No Take Zone”;
- All fishing activities are strictly prohibited within the core zones;
- Research studies, bio-physical assessments, monitoring and enforcement activities such as patrolling are only allowed to entry in the core zones;
- Permanent infrastructures are strictly prohibited except for Watchtower/ Guard House establishments within the buffer zone for patrolling purposes;
- MPA boundaries will be delineated thru installation of bouys;
- A mooring buoy is allowed which is designed in a manner that there is a heavier weight located right in the bottom of the sea or anchored;
- All tourist boats/patrol boats are only allowed to anchor at the designated anchor areas/installed mooring bouys;
- Ban on the use of jet skis/jet boats in all marine SPZ except for patrolling/surveillance;
- Recreational activities are only allowed within the buffer and designated areas as identified in their local ordinances; and
- Recreational activities are allowed within the buffer zone of Pilar MPA.

Multiple Use Zone

These are areas outside the strict protection zone where fishing and other fisheries activities, tourism and navigation are allowed consistent with the updated management plan. Other areas as zoned by the PAMB SIPLAS during public consultation are the following:

Mangrove areas

These includes the mangrove areas of Sta. Monica, Dapa, Del Carmen, Socorro, General Luna, Pilar, San Benito, Burgos and San Isidro. The management prescriptions of mangrove areas under MUZ include the following:

- Cutting and culling of mangrove trees is strictly prohibited;
- The following activities may be allowed: navigation, ecotourism, aquaculture; prescribed shell gleaning (shell gathering) and crab collection, traditional and recreational fisheries (using legal methods);
- Other activities such as mariculture and aquasilviculture are allowed;
- Eco-tourism activities that may be allowed include viewing, kayaking, boating, photography, zip line, filming, nature tripping and walking as duly approved by SIPLAS PAMB. Sustainable eco-tourism will be promoted;
- The construction of concrete stilt boardwalks and viewing decks may be allowed upon approval of the SIPLAS PAMB, provided there will be no destruction of mangrove stand during construction;
- This management zone should be properly demarcated with markers and signage;
- Existing settlements within the mangrove area shall be resettled;
- No additional settlements within the mangrove areas; and
- No reclamation/fill-in within the mangrove areas.

Seagrass Areas

This includes the entire seagrass area of the nine (9) municipalities in SIPLAS with the following management prescriptions under MUZ:

- Gleaning in seagrass areas are allowed with regulation on human activities following local policy and legislation;
- Seagrass removal is strictly prohibited;
- Rehabilitation will be allowed in identified seagrass areas
- Construction of permanent structures are strictly not allowed especially to the high seagrass beds percentage cover;
- Designated boat docking areas are allowed;
- Construction of jetty will be subject to full blown EIA;
- Dredging and clearing in seagrass beds must be avoided; and
- No reclamation within the seagrass beds.

Coral Reef

- No quarrying of coral boulders;
- No filling-in in shallow coral reef areas;
- Sustainable fishing practices are allowed;
- Coral rehabilitation is allowed
- Mouring bouys are allowed;
- Anchorage ensure in sandy areas;
- Practice good reef etiquette while diving, snorkeling and boating; and
- Conduct coral reef assessment and monitoring.

Navigational area

This includes the navigational lane in Burgos: Sabang; Dapa: Dapa channel passing through Brgy. Cambas-ac; San Benito: Brgy. Talisay; Sta. Monica: Brgy. T. Arlan; Socorro: Brgy. San Roque; San Isidro: River; and Del Carmen: Brgy. Del Carmen (Poblacion). The management prescriptions of navigational area under MUZ includes the following:

- All navigational lanes must be delineated as described in municipal ordinances and following SIPLAS PAMB Resolutions;
- Navigational lanes for vessels such as commercial vessels, barges and cruise ships shall be delineated;
- In Burgos, navigational lane is located in Brgy. Sabang and all pumpboats with 16 horsepower are allowed in the navigational lane; and
- Mooring buoys will be established within the identified zones.

Foreshore area

These include the foreshore areas and ports in SIPLAS specifically located in the following municipalities:

Municipality	Sites/ Barangay
General Luna	<ul style="list-style-type: none">• Brgy. Poblacion 1,• Brgy. Catangnan (Cloud-9)• Brgy. Libertad (PCG Station)
Dapa	<ul style="list-style-type: none">• Brgy. Jubang (international port), Dapa Domestic Sea Port• Existing PPA office and terminal at Brgy. 5 (Poblacion)• Six (6) barangays connecting the middle east islands of Dapa (Propose Circumferential road)• Sunrise and Sunset Boulevard (Existing)
San Benito	<ul style="list-style-type: none">• Brgy. Talisay: Existing seawall and port
Pilar	<ul style="list-style-type: none">• Existing stretch of seawall at Brgy. Punta, Asinan, and Pilaring
Socorro	<ul style="list-style-type: none">• Existing seawall/wharf at Brgy. Rizal and Brgy. Navarro to Brgy. Taruc
Sta. Monica	<ul style="list-style-type: none">• Existing boulevard, floating cottage, and viewdeck at Brgy. T.Arlan
Burgos	<ul style="list-style-type: none">• Existing seawall at Poblacion 2

Source: PAMO SIPLAS, CY 2020

The following are the management prescriptions of foreshore area under MUZ:

- No additional infrastructures are allowed in the seaward area;
- Existing jetties/common wharves at Brgy. Poblacion 1, General Luna shall apply appropriate tenurial instrument;
- Repair of the existing municipal and barangay jetties are allowed;
- Construction of shoreline protection will be allowed subject to full blown EIA;
- No reclamation/fill-in allowed; and
- Appropriate tenurial instruments shall be issued if needed.

Beach Area

These include the following beach areas used for recreational activities:

Municipality	Barangays/ Islets
Burgos	<ul style="list-style-type: none">• Stretch of beach area in Brgy. Baybay, Poblacion 2, Poblacion 1, and Bitaug
Dapa	<ul style="list-style-type: none">• Brgy. Corregidor (beach area surrounding the island), Brgy. Union, Brgy. Don Paulino, Brgy. Monserat and Brgy. Dagohoy
Del Carmen	<ul style="list-style-type: none">• Kawhagan Islet, Brgy. Caub, Brgy. Halian, and Isla Berdi and Pamomoan beach
General Luna	<ul style="list-style-type: none">• Stretch of beach area from Brgy. Malinao, Pob. 1 to 5, Brgy. Catangnan, Brgy. Cabitoonan, Brgy. Libertad, Brgy. Sta. Fe and including the islets such as Pansukian, Guyam, Brgy. Daku, Suyangan, La Januza, and Anajawan.
Pilar	<ul style="list-style-type: none">• Brgy. Pilaring, Consolacion, and Caridad parallel to the National Highway;• From edge of boundary of Brgy. Caridad and General Luna to Hagakhak Point at Brgy. Sta. Cruz and Brgy. Salvacion area
San Benito	<ul style="list-style-type: none">• Naked Island, Pagbasayan Island, Kangkangon islet, white beaches of Brgy. Talisay and Brgy. Maribojoc
San Isidro	<ul style="list-style-type: none">• Brgy. Pacifico and Brgy. Tigasao
Sta. Monica	<ul style="list-style-type: none">• Stretch of beach area from Brgy. Garcia to Brgy. Magsaysay
Socorro	<ul style="list-style-type: none">• Island and islets of Sohoton Bay, Brgy. Pamosaingan, Secret Beach, La Fortuna

Source: PAMO SIPLAS Public Consultation, CY 2020

The management prescriptions of the beach areas under MUZ are the following:

- Tourism related establishment/structures inside the buffer area may be allowed but not permanent structures;
- Establishment of the recreational/ecotourism structures are allowed after the 40-meter easement per DAO 2021-07 (no additional jetty within the easement);
- Rehabilitation projects such as beach forest plantation are encouraged within the area;
- Shoreline protection and development are allowed with the following supporting documents such as EIA, site development plans, and other conditions based on DAO 2019-05;
- Collection of white beach sand for domestic use, souvenirs, and private and public development projects is strictly prohibited; and
- Sustainable eco-tourism will be promoted.

Fishing Ground will be further enhanced upon incorporation of coastal zonings of the nine (9) LGUs within SIPLAS.

This includes the nine (9) municipalities of SIPLAS with the following management prescriptions:

- Gleaning activities shall be regulated as specified in the approved municipal ordinances;
- Seaweed farming activities are allowed following the prescriptions indicated in coastal zoning and fisheries ordinances of municipalities;
- Aquaculture livelihood are allowed in the designated area with the following regulations and guidelines given by the BFAR;
- Fishing gears allowed to be used in SIPLAS waters will follow based on the approved protected area unified fisheries policy;
- Fisheries management activities such as open-close season (c/o Unified fisheries policy), fishing gear restriction and catch quota, among others, can be implemented following prescriptions in fisheries ordinances; and
- Marine managed access areas will be considered as sub-zone under MUZ.

Coastal and Marine Ecotourism sites

This includes all coastal and marine recreational areas and ecotourism sites in nine (9) municipalities of SIPLAS. The ecotourism sites such as Cloud 9 and Sugba Lagoon has an approved ecotourism management plan, while, ecotourism management planning for Mangrove View Deck is on-going.

Ecotourism sites in each municipalities includes the following:

Municipality	Sites
Burgos	<ul style="list-style-type: none"> • Stretch of beach areas of Brgy. Baybay, Poblacion 2, Poblacion 1, Bitaug • Bayod surfing area • Potential diving sites
Dapa	<ul style="list-style-type: none"> • Brgy. Sta. Fe (Mangrove Ecotourism Project – Floating Boardwalk) • Brgy. Union (Mangrove and beach area), • Brgy. Corregidor beach area • Brgy. Don Paulino surfing site • Potential diving sites at Brgy. Corregidor, Brgy. San Miguel, and Brgy. Buenavista
Del Carmen	<ul style="list-style-type: none"> • Sugba Lagoon at Brgy. Caub • Kawhagan islet • Mangrove Boardwalk • Mangrove view deck • Pamomoan Island • Stretch of beach areas • Potential diving sites
General Luna	<ul style="list-style-type: none"> • Brgy. Sta. Cruz (Bugak or spring) • Surfing sites: Brgy. Catanganan (Cloud 9, Quick silver, Jacking Horse, Tuason Point), Pob. 1 and 2 (Cemetery) Brgy. Libertad (Rock Island), Brgy. Daku, Brgy. Anajawan • Brgy. Sta. Fe (Rock Island),

Municipality	Sites
	<ul style="list-style-type: none"> Island hopping at Daku Island, Guyam Island, and Pansukian Island Brgy Sta. Fe to Libertad [Blue Cathedral (diving site)] Diving and snorkeling site at General Luna MPA Brgy. Catangnan, Libertad, Sta. Fe, Suyangan, Anajawan, Polacion 1 and Malinao as beach combing and swimming area Pangitlogan Island (proposed swimming area) Brgy. Anajawan and Suyangan (Snorkeling and swimming area) Potential mangrove tour at Brgy. Tawin-tawin and Magsaysay
Pilar	<ul style="list-style-type: none"> Magpupungko Tidal Pool and Beach Pilar MPA (Buffer Zone) Lukod Beach Area Pilar Mangrove Firefly Watching Paghungawan Marsh nature and wildlife adventure Existing surfing site at Brgy. Salvacion Snorkeling site at MPA buffer Floating cottage at Brgy. Punta as venue for International Gamefishing
San Benito	<ul style="list-style-type: none"> Pagbasayan Islet Kangkangon Islet Aerial Zip-line from Sitio Butong to Litalit Island Campayas Vanishing Island
San Isidro	<ul style="list-style-type: none"> Stretch of beach area in Brgy. Pacifico and Tigasao River Cruise Kanbaktin Spring
Socorro	<ul style="list-style-type: none"> Pagatpat mangrove and bat sanctuary for Bird and Bat watching at Brgy. Pamosaingan Sohoton Cove and Bay Tiktikan Lagoon San Roque Giant Mangrove Beach combing, Swimming area, and snorkeling area at Kwaknitan Cove, Hidden Resort, Cinnamon Resort, La Fortuna Beach Area, Nakayawit Beach, and Tiktikan Beach Coastal Falls: Salog Falls and Magkahuyog Falls
Sta. Monica	<ul style="list-style-type: none"> Long stretch white beach from Brgy. Tangbo to Brgy. Rizal Hagukan Dive Pool

Source: PAMO SIPLAS, CY 2020

The following are the management prescriptions of coastal and marine ecotourism sites under MUZ:

- Ecotourism sites including surfing, diving, islets and other recreational activities are allowed subject to PAMB approval;
- In General Luna, recreational activities such as snorkeling will be allowed within 50-meter buffer zone;
- Designate areas for diving sites;
- Structures and support facilities should be consistent with DAO 2009-09 and related environmental policies and LGU ordinances;
- All ecotourism sites must prepare Ecotourism Management Plan (EMP);
- Determine and implement ecotourism site carrying capacity; and
- Site-specific management prescription per EMP will be followed.

Surfing areas

This includes the surfing area in SIPLAS with the following designated sites:

Municipality	Surfing Site/ Location	Level
Burgos	Bayod Surf Break/ Pob. 1 and 2	Expert
Dapa	Guian Surfing Area/ Brgy. Don Paulino	Beginner
General Luna	Cloud 9/ Brgy. Catangan	Expert
	Quick Silver/ Brgy. Catangan	Expert
	Jacking Horse/ Brgy. Catangan	Beginner
	Cemetery Pesangan/ Pob. 5	Intermediate
	Dako Surf Break/ Brgy. Dako	Intermediate
	Anajawan Surfing Area/ Brgy. Anajawan	Expert
	Rock Island/ Brgy. Libertad	Expert
	Stimpy's / Brgy. Sta. Fe	Intermediate
Pilar	Salvacion Surfing Area/ Brgy. Salvacion	Intermediate
San Isidro	Pacifico Surfing Area/ Brgy. Pacifico	Expert

Source: Siargao Island Surfer's Association, CY 2020

The management prescriptions of surfing area under MUZ are the following:

- All surfing spots in the island are categorized by level experience of the surfers;
- Beginners should be guided by the accredited surfing instructor;
- Tourists who are well experienced in surfing should present their accredited surfer's ID issued by Philippine Surfers Association;
- No Siargao Island Surfers Association (SISA) ID no surf lesson policy.
- Presence of lifeguards within the surfing area;
- Surfing can only allow age limit of 8 years old until able;
- Surf etiquette and rules shall be installed in the information and surfing lesson area;
- Dumping, throwing, using or causing to be dumped into or placed within the area such as toxic and waste substances whether solid, liquid or gas that can cause deteriorate of any natural resources are not allowed within the area;
- No fishing is allowed within the surfing area;
- Strictly no collection of flora and fauna that are found specially the endangered and vulnerable species and ecosystems thrive within the area;
- Other watersports activities such as windsurfing, kitesurfing, scuba diving and jet skis are strictly not allowed in these areas;
- Ban on the use of jet skis / jet boats in Surf Sites-tourist are not allowed to swim in the area;
- The only ones who should be allowed to operate jet skis in all areas are the PCG for emergency purposes; and
- First Aide/Life Guards must be readily available within the area.

A. Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) Mainstreaming

The SIPLAS will continue to integrate climate change adaptation and disaster risk reduction into its management interventions. This will be done in order to be proactive in protecting ecosystems and communities from the effects of climate change. In the short term, the goal will be to raise the protected area stakeholders' knowledge of their involvement in combating climate change.

The primary goals of this strategy is to increase the competency of LGUs, particularly the barangay LGUs, in responding to the effects of climate change and impacts of disasters, as well to enhance community preparedness. Furthermore, the following are classified as important climate change adaptation measures: mangrove and ENGP protection and maintenance, conservation and rehabilitation of habitats; development and protection of water sources; establishment of marine protected areas (MPAs) and MPA networks; development of fuelwood plantations; and strengthening of inter-agency operations and policy enhancement.

B. Collaborative Management

SIPLAS will promote collaborative management through strengthening stakeholder relationships, increasing LGU participation, forming inter-LGU alliances and networks, improving coordination and feedback systems, and collaborating with willing stakeholders. Active LGU engagement in protected area management activities, such as restoration of degraded terrestrial and coastal habitats, enforcement and patrol activities, ecosystem resource valuation, and biodiversity monitoring would be sought in accordance with this approach. Within the management plan period, important goals will include LGUs allocating annual budgets for SIPLAS in their Annual Investment Plans (AIPs) and mainstreaming PA Management Plan strategies (i.e., management zoning and climate change adaptation) in their land use and local development plans.

The SIPLAS PAMB will enter into co-management agreements with LGUs, Peoples Organizations, Non-Government Organizations, Water Districts, operators of tourism facilities, and other private investors for the management of specific portions of the protected area. The SIPLAS PAMO will identify the management areas of these potential resource managers and, with clearance from the PAMB, will negotiate the terms of the agreements, with a focus on sustainable use and the protection and conservation of biodiversity resources. This, however, will only apply to multiple use zones where resource use is regulated. The PAMB may issue a community tenure instrument via the Protected Area Community Based Resource Management Agreement (PACBRMA) to tenured migrants, Special Use Agreements in Protected Area (SAPA), and Co-Management Agreements with other stakeholders within SIPLAS in accordance with existing policies. The collaborative approach will enable stakeholders to understand the relationship between the resources used and their conservation and sustainable use.

C. Community-Based Resource Management

The protection and conservation of terrestrial and marine resources in SIPLAS is a priority concern of the PAMB, PAMO, and the LGUs. Community-based resource management will be implemented recognizing the inherent constraints and limitations of national agencies like the DENR. This will allow residents, officials, and people's organizations from different barangays to participate in various facets of resource management. Residents are the primary stewards and benefactors of natural resources in their communities, thus their participation in protected area management is essential. This strategy acknowledges that community-based natural resource management is both efficient and cost-effective.

Through the development and implementation of biodiversity-friendly livelihood activities, it is also expected that community organization development, and participation in the long-term management of SIPLAS will be increased. The majority of resource degradation in SIPLAS is caused by unsustainable activities such as fuel wood gathering, *kaingin* making, and illegal fishing practices. As a result, there is a need to provide environmentally sustainable alternative sources of income to local communities.

SIPLAS also plans to use community based eco-tourism as a main strategy. Stakeholder collaborations will be formed to enable the development of a community-based eco-tourism program. PAMB/DENR, in collaboration with other institutions such as the Department of Tourism (DOT), Local Government Units (LGUs), Non-Government Organizations (NGOs), and academic and research institutions will assess, develop, promote and support tourism-based livelihoods to provide alternatives to unsustainable activities of some protected area households.

D. Sustainable Financing

Priority will be given to the growth and establishment of long-term funding sources to support SIPLAS' activities. The SIPLAS PAMB and PAMO have been restricted in their ability to execute previous plans due to a lack of financial capital. The NIPAS Act as amended by RA 11038 or the ENIPAS Act, as well as its implementing rules and regulations, provide an Integrated Protected Area Fund (IPAF). However, this feature has yet to be completely utilized. There is a need to evaluate the various tools available in the protected area, determine their uses and users, and create a set of suitable user fees and collection systems.

The PAMB will then design a platform for Payment of Ecosystem Services (PES) and resource user's fees, as well as a process for allocating and disbursing IPAF funds. The establishment and maintenance of PES will be prioritized in SIPLAS. Budget counterparts from LGUs as well as grants will also be sought. Partnerships between the public and private sectors, especially in forestry, fishery, and the tourism sector will be explored.

6.2 Management Programs/Focus

To identify and develop management interventions, the SIPLAS management plan employs an integrated ecosystem management practice. This strategy calls for an enhanced land and water resource management program that will ensure that residents in SIPLAS have access to sufficient and high-quality water while also preventing land degradation. It also calls for the integration of terrestrial and coastal and marine resources management projects, since the two (2) ecosystems are intertwined and SIPLAS communities' livelihoods are heavily reliant on both. Resource management areas are not limited to the administrative borders of LGUs under this strategy. The protected area management plan must, however, be aligned with the Comprehensive Land Use Plans (CLUPs) and other growth and investment plans of the LGUs for efficient and long-term management.

The proposed programs for addressing the identified problems and issues within the protected area are discussed further below. The programs are aimed at protecting and conserving biodiversity resources on land, in the sea, and in the air, as well as improving the socioeconomic situation of protected area communities and strengthening the protected area governance structure. The proposed initiatives are divided into four categories: (a) terrestrial management, (b) coastal and aquatic management, (c) cross-cutting management, and (d) governance enhancement and institutional strengthening.

Figure 67 depicts the proposed management zones and sub-zones that are critical components of the terrestrial, coastal, and marine programs.

6.2.1 Terrestrial Management

Biodiversity conservation program

The zones designated as strict protection zones which covers 7,326 hectares is the focus of the terrestrial biodiversity conservation program. Since these are areas of high ecological value, they would be granted the highest level of protection from harmful and illegal activities. The program's ultimate goal is to improve the robustness of these biodiversity hotspots to climate change.

The program will have four component activities: (a) ground demarcation of management zones, (b) biodiversity research, documentation and monitoring; (c) habitat restoration and rehabilitation; and (d) community-based forest protection and law enforcement.

➤ **Ground demarcation of management zones**

The management zones can be more effectively enforced if the SPZ and MUZ boundaries are marked on the ground. Signs will be placed in strategic locations in the SPZ to clearly identify it as a biodiversity preservation and conservation zone. These will inform the public that human activities, with the exception of science, are prohibited in these areas. Prior to the actual land demarcation, community meetings will be held to confirm the proposed strict protection zone boundaries. Natural features such as ridges, rivers/ creeks, mountain tops, and roads will be used as much as possible as boundaries. Planting of conspicuous indigenous species such as bamboo, *dapdap* (for riparian areas), *anonang* (edge clearings), *kakawate*, and among others.

The defined zones will have to be integrated into the Barangay Development Plans, and the CLUP and zoning ordinance of the LGU so these can be enforced. The final boundaries that are demarcated on the ground will have to be plotted into the official SIPLAS map.

The SIPLAS PAMO and the LWG will lead the initiative to evaluate the investment requirements for land demarcation, identify possible sources of funding, and prepare the appropriate funding proposals to be submitted to the DENR/BMB by the PAMB. They'll be in charge of planning, coordinating, and overseeing the ground demarcation operation as funding becomes available.

➤ **Biodiversity Research, Documentation and Monitoring**

In recent years, data on the biodiversity resources of SIPLAS has not been updated. Every five years, an updated inventory of flora and fauna in the protected area is needed for enhancing the efficiency of conservation activities and tracking the status of biodiversity in the area. The SIPLAS PAMO had developed links with academic, research institutions, and Non-Government Organizations in Caraga Region and in the country for any interest in biodiversity studies in SIPLAS. A guideline is set by the SIPLAS PAMB Sub-Committee on Biodiversity Assessment, Monitoring and Conservation Management on research studies and collaborations. Simultaneously, the SIPLAS PAMO, with the aid of BMB, will draft proposals for external funding to perform a flora and fauna inventory in SIPLAS.

The strict protection zone will be prioritized as research areas to identify key species for protection, conservation, and propagation, as well as key species that are considered good indicators of ecosystem health and/or climate change. The scope of study may include population, habitat requirements, biology, and food and feeding habits.

The SIPLAS PAMB would enter into a partnership agreement with interested research agencies, encouraging them to include the established People's Organizations, barangay LGU's, and other interested parties in their field activities. The findings of the studies and technical assistance activities must be presented to the SIPLAS PAMB and other stakeholders, along with relevant recommendations for policy development, action/implementation, and further confirmation or reproduction.

This operation has the potential to greatly improve SIPLAS' knowledge base. BMB's Biodiversity Monitoring System (BMS) will be updated and evaluated to fit SIPLAS' conditions and monitoring criteria as well as the conduct of monitoring of Biodiversity Assessment and Monitoring System (BAMS). For starters, key indicator species for ecological health and climate change will be included. The SIPLAS PAMO will ensure that BMS findings are processed and used to make decisions. Daily budgets and formal links with appropriate agencies will be used to maintain periodic monitoring of biodiversity resources within the protected area.

Database on researches conducted in SIPLAS will be develop and established. This will be in partnership with local academe and research institutions. Research protocols will be implemented to all researches that will be conducted in SIPLAS.

➤ **Habitat Restoration and Rehabilitation**

The SIPLAS PAMO, in partnership with communities as well as academic and scientific institutions will identify critical ecosystems that need urgent rehabilitation. The SIPLAS PAMO will aid on the crafting of management plan and fund sourcing for the declaration of the area as wildlife sanctuary/nesting sites, which will serve as a roadmap for those interested with the actual rehabilitation. In formulating effective conservation and regeneration strategies for various ecosystems, it is important for SIPLAS PAMO to partner with other stakeholders from regional and local governments offices and agencies.

Rainforestation technology, which utilizes indigenous species, can be used to rehabilitate the natural forests. The DENR's Enhanced National Greening Program (ENGP) may aid on rainforestation. The adopt ENGP areas is encouraged to further enhance and maintain natural forest.

➤ **Community-Based Forest Protection and Law Enforcement**

SIPLAS will sustain the implementation of community-based forest conservation and law enforcement by involving barangay LGUs, protected area communities, and Peoples Organizations (particularly tenure holders) in forest protection activities. In strategically placed upland barangays, at least eight (8) barangay *Bantay-Gubat* teams, with at least three members each team, will be organized. DENR will orient and instruct members of these teams on forest security and law enforcement, and they will be given the authority as Deputized Environment and Natural Resources Officers (DENROs). The activities of the *Bantay-Gubat*

teams will be overseen by the chairpersons of the Barangay Councils' Committees on Environment and Natural Resources, in cooperation with the LGUs' MENROs and the PASu.

The *Bantay-Gubat* teams, with the support of the Barangay Council and DENR field personnel, will conduct routine foot patrols and set up checkpoints in strategic areas that are known to be hotspots for illegal activities. The SIPLAS PAMO, the barangay LGU council, and the Bantay-Gubat team will formulate an enforcement strategy and monitoring procedures for patrol operations. Criminal activity, encroachment, and forest fires, as well as other related on-site discoveries, such as sightings of significant flora and fauna, would be adequately recorded, ideally geo-tagged and with picture evidence. Violators will be apprehended, unlawfully harvested goods will be confiscated, and evidence and court charges against violators will be followed in accordance with established procedures and guidelines. The SIPLAS PAMO and LGUs would consider providing assistance with case filing.

This will be supplemented through Landscape and Wildlife Indicator (LAWIN) System as a monitoring tool of SIPLAS PAMO. This will strengthen the forest and biodiversity protection through the application of a science based and technology aided forest protection system that is relevant to forest and biodiversity management.

Municipal and barangay local government units (LGUs) will be encouraged to pass local ordinances to enhance the forest conservation effort. They would also be encouraged to provide DENROs monetary or non-monetary incentives to acknowledge and reward them for their time and services.

The SIPLAS Inter-Agency Law Enforcement Cooperation (SIALEC) will be mobilized which is composed of the nine (9) LGUs, concern National Government Agencies such as PNP, PNP Maritime, and PCG. The point of collaboration include patrolling in the upland and coastal areas.

Socio-economic development

This component's programs are aimed at improving the socioeconomic conditions in SIPLAS communities. This will include initiatives relating to livelihood and social services, such as protecting water supplies and ensuring land tenancy protection, all of which are essential supports to livelihood.

➤ Provision of land tenure security to legitimate protected area claimants

Together with the LGU MENRO employees, the PASu Office may recognize eligible claimants within the protected area who could be considered for the granting of land tenure instruments. Their property rights can be confirmed and demarcated on the map. Priority would be assigned to anyone close to the "hotspot" areas where unsustainable economic practices are taking place. These claimants would be grouped into people/community groups and will be aided in obtaining suitable tenure tools, such as the PACBRMA, SAPA and Co-Management Agreement will be explored. The SIPLAS PAMO will expedite the processing and issuance of PACBRMA and, if authorized, will assist PACBRMA holders in developing Community Resource Management Plans (CRMPs), Comprehensive Development and Management Plan under SAPA, and Co-Management Plan. In addition, technical assistance will be given in the execution of these plans.

The SIPLAS PAMO will then complete the Protected Area Survey and Registration of Protected Area Occupants (SRPAO) in SIPLAS and will preserve and update this as a permanent database of tenured migrants in SIPLAS.

The SIPLAS PAMO and the LGUs will conduct periodic evaluations of tenure holders' results depending on the terms of the tenure agreement and the tasks outlined in their management plans.

➤ **Development of agroforestry farms**

The increase on tourism activities in SIPLAS, the demand for food especially fruits and vegetables will correspondingly increase. Due to the scarcity of alienable and disposable (A and D) lands, the pressures to use current forestlands for agriculture and plantations are anticipated. In anticipation of this situation, suitable areas for agroforestry development will be identified within the multiple use zones. Forest occupants and/or upland farmers in these areas (as well as in A and D lands) will be supported in growing fruit orchards and vegetables to meet the needs of both locals and visitors.

Agroforestry farmers will be trained to agroforestry practices and help preparing their own farm plans which should integrate into their farming system soil and water conservative measures to minimize soil erosion and reduce pollution of coastal areas. They will be assisted in sourcing high-quality seedlings, especially for fruit trees, and will be guided and closely monitored during the development of their farms.

The SIPLAS PAMO will consult the Department of Agriculture to recognize fruit trees and vegetables that will thrive in the SIPLAS, as well as the technology that farmers might use and the production capacity of these crops. To highlight integrated farming systems, demonstration farms may need to be established. The amount of technical and financial assistance given to farmers will be determined by the amount of funds that the SIPLAS PAMO and LGUs will raise for this initiative from municipal and provincial LGUs, the NGP, the private sector, and other donor-funded projects in SIPLAS.

Agroforestry production area is projected to be 13,095 hectares, including areas that could be covered by PACBRMA. For the use rights of the PO members in these tenured areas, an agreement between the PO and the individual members will be applied. Individual occupancy within PACBRMA areas would be efficiently recognized and thus address security of tenure concern of individual farmers.

➤ **Protection and rehabilitation of water production areas**

Water is a valuable resource for the Siargao Islands since they are an island ecosystem. Because of the island's increasing population and tourism industry, the demand for water, both for agriculture and domestic use, is expected to rise. However, existing and potential water sources is increasingly being threatened by unstable forest-based economic activities, pollution from domestic sources, unregulated extraction, and by climate change, particularly increasing temperature.

The SIPLAS PAMO, in partnership with municipal and barangay LGUs, will collectively pursue the following to protect water sources:

- Inventory of all water supplies in SIPLAS (location and functionality), both for domestic water supply (Levels 1, 2, and 3) and irrigation, and find other possible sources. The

inventory completed for the National Water Resources Board's (NWRB) national *Listahang Tubig* project may be explored;

- Prioritize the state of the water production area/watershed as well as the water quality of both current and future water supplies;
- Identify the priority water production areas for safety, regeneration, and management on a map and on the ground;
- Identify the relevant on-site managers for these water production areas (e.g., water districts, barangay LGUs, rural water associations, and private establishments such as major resorts) and conduct consultations and agreements with them on the water production areas' long-term usage and management;
- Facilitate the signing of an agreement for the maintenance of the water processing areas between the PAMB and the on-site managers;
- Assist on-site managers in drafting water development area management plans and submitting them to PAMB for approval; and
- Assist on-site managers in maintaining and restoring watersheds in accordance with the agreed management strategy.

The water protected areas are calculated to be 5,296 hectares in size. Watershed restoration and conservation would first concentrate on catchment areas that serve four water districts' Level 3 schemes and barangay water bodies. The SIPLAS PAMO and MENRO will seek technical assistance and support from concerned agency on training on enrichment planting, agroforestry, and soil and water conservation for barangay water production areas, as well as assist barangays in setting up nurseries (as needed) to meet their seedling needs.

➤ **Development of fuel wood plantations and woodlots**

Fuel wood plantations will be established to meet the needs of the inhabitants of the Siargao Islands and, as a result, fuel wood gathering in mangroves and woodland areas will be reduced. The woodlots would meet the local population's wood requirements, as well as reduce timber poaching in SIPLAS forests. Initially, 187 hectares were set aside for fuelwood planting, with the remaining 92 hectares set aside for woodlots.

The suggested areas must be validated by the PASu and the LGUs to ensure that they fall under the multiple use zones. Determination of allowable supply and demand volume for fuel wood will be undertaken. Actual occupants/claimants in these areas will be established and will receive financial and technical assistance in preparing and developing management plan as well as the fuelwood and tree plantations, along with the acquisition of suitable planting materials. The PASu Office will work to incorporate this into the NGP and target these areas for production, employing fast growing indigenous species.

➤ **Strengthening of people's organizations for Biodiversity Friendly Enterprise development**

Inventory of existing people's organizations (PO's) and Biodiversity friendly Enterprise (BDFE) projects is essential before developing and implementing potential and enhancing existing BDFE project enterprises. PO's that are actively involved in cooperative enterprises or livelihood programs will be assessed and evaluated for their skills and training needs. Skills improvement trainings in enterprise growth and administration, leadership and resource evaluation, strategic planning, and financial management will be scheduled based on the results of these evaluations. Cross trips to neighborhoods with successful livelihood programs

will be arranged as needed. This activity will be led by the SIPLAS PAMO and the LGUs in working together to secure funds for the training and other requirements to enhance the viability of existing livelihood activities and improve or expand their operations. For production, promotion and marketing, the LGU will assist organized communities to establish partnership with other agencies (e.g., Provincial LGU, DTI) and the private sector.

Related to this activity, the SIPLAS PAMO and the LGUs will collaborate with other agencies in creating other sources of income for local communities, resulting in more jobs and diversify income sources. These may be linked to agroforestry, fisheries conservation, or community based eco-tourism initiatives. Market/feasibility studies will be initiated as well as fund sourcing.

6.2.2 Coastal and Marine Resources Management

Coastal habitat and species conservation program

Strict protection zones cover about 12,024.35 hectares of marine and coastal areas. This includes marine sanctuary, mangrove reserve areas, nesting and foraging sites in protected areas are considered havens for endangered marine species.

The following are the five (5) tasks that will be included in this program: (a) management zone demarcation, b) effective MPA management, c) coral restoration, and d) mangrove conservation and restoration.

➤ **Management Zone Demarcation**

Table 74 is the lists of LGU areas that were initially identified as coastal and aquatic habitat protection and sustainable use areas. These areas would need to be assessed further to ascertain their present ecological importance and conservation needs.

The identification of unique mangrove areas and seagrasses that may be included in the central zone is a part of the evaluation process. Reef fish and other invertebrates use mangroves and seagrass beds as nursery grounds. Many coral fishes such as groupers, snappers, emperors, parrotfishes, rabbitfishes, and goatfishes, spend most of their lives in mangroves and/or seagrass beds. If they are not protected and are lost or destroyed, the number of fish that are "recruited" on the reefs as young adults would be significantly reduced. Their population will continue to decline until localized extinction or extirpation of these species occurs. Within mangrove forests, endangered species habitat areas and breeding/nursing areas of fishes should be established through scientific research for conservation and protection purposes.

Similarly, sea grass assessment has been undertaken in CY 2019 and constant monitoring of this habitat particularly on threat focused will be conducted in order to address issues and concerns in the area thereby protecting seagrass areas as shown in Figure 23. SIPLAS PAMO take the lead in the conduct of monitoring in coordination with the MENROs and NGO's.

The confirmed conservation areas must be delineated and mapped so that they can be managed and subjected to continuing biodiversity monitoring. To guarantee that these areas are not disturbed, signages may be installed. For these areas, SIPLAS PAMO and LGUs will collaborate to develop a PAMB approved site-specific protection and conservation plans.

Table 74. Coastal and Marine Areas Identified for Biodiversity Protection, Rehabilitation and Conservation and/or Sustainable Use

Municipality	Barangay	Features of the Area
Dapa	Corregidor, Union, Buenavista	Existing and proposed Marine sanctuary
	Bagakay, Union, Uno (Can-uyan, Kawit, Subangan), Monserat, Cabawa, Cambas-ac, Consolacion, Buenavista, San Carlos, San Miguel, Dagohoy, Sta. Felomina, Corregidor, Catabaan (all coastal barangays)	Fringing Reef/Channel Reef

Municipality	Barangay	Features of the Area
	Sta. Fe, Bagakay, Cabawa, Cambas-ac, Monserrat, San Carlos, Union, Don Paulino, Consolacion, Jubang, Buenavista	Mangrove Forest
	Brgy. 12, Sta. Fe, Cambas-ac, Cabawa	Mangrove Rehabilitation Site
	Cabawa, Corregidor, Dagohoy, Monserrat, Sta. Felomina, Union, Don Paulino, San Carlos, Bagakay, Consolacion, Brgy. Pob. 1,2,3,7,12,13	Seagrass Area
Socorro	Pamosaingan, San Roque, Dona Helen, Santa Cruz, Sudlon, Lawigan (Salog), Mating-ob (Kanlanuk Bay), San Roque (Mangroves)	Eight (8) Marine Protected Areas
	Markaa, Kanlunis, Poblacion, Pamosaingan, Kanlanuk, Dona Helene, Sohoton, Hidden Island,	Fringing Reef
	Pamosaingan	Evolutionary Distinct Genetically Endangered (EDGE) Coral Species
	San Roque	Giant Mangrove Forest
	Rizal, Pamosaingan, Sta. Cruz, Kanlanuk	Mangrove Forest
	Taruc, La Fortuna	Beach Forest
	Rizal, Navarro, Taruc, Doña Helen, Pamosaingan	Seagrass Area
San Benito	Talisay, Maribojoc	Marine Sanctuary
	Bongdo, Talisay, Maribojoc	Mangrove Forest
	Maribojoc, Talisay, Sta. Cruz, San Juan	Fringing Reef
	Maribojoc, Talisay, Sta. Cruz, San Juan, Pagbasayan Islet	Seagrass
	Talisay, San Juan, Sta. Cruz, Maribojoc	Seaweed farming
	Kambiling Islet	Critical habitat for Dugong
	Bongdo	Critical habitat for Saltwater Crocodile
Del Carmen	Mabuhay, San Jose, Del Carmen, Cancohoy, Katipunan, Esperanza, Lobogon, Sayak, Antipolo, Cabugao, Bitoon, Domoyog, San Fernando	Mangrove forests and fauna
	Hali-an, Caub, San Fernando	Marine Sanctuaries
	Caub, Tagbuyakhaw, Mapuya, Yaonan, Masag-a, Domoyog, San Fernando, Halian, Kawhagan, Tona	Patch Reef
	Caub Lake	Giant Mangrove

Municipality	Barangay	Features of the Area
	Caub, San Fernando, Hali-an, Del Carmen, Bitoon, San Fernando	Seagrass
Pilar	Asinan, Pilaring, Dayaohay, Maasin (crablets), San Roque, Datu, Mabini, Salvacion, Katipunan, Consolacion	Mangrove forests and Fauna
	Centro, Punta, Asinan, Pilaring	Marine Sanctuary
	Magpupungko, Pilaring	Beach forest
	Caridad (Cathedral)	Patch Reef
	Caridad, Pilaring, Centro, Asinan	Seagrass
San Isidro	Tigasao, Pacifico	Beach forest
	Del Carmen, San Miguel, Del Pilar	Mangrove
	Tigasao	Marine Sanctuary
	Pacifico	Patch Reef
Sta. Monica	Rizal, T Arlan, Magsaysay, Abad Santos	Mangrove and Fauna (migratory birds like egrets and herons, bats)
	Rizal, Alegria, T Arlan,	Existing MPAs
	Tangbo, Garcia, Abad Santos, Magsaysay	Proposed MPAs
	Garcia, Alegria, Tangbo, Rizal	Nesting sites of marine turtle
	Garcia, Alegria, Tangbo, Rizal	Nesting sites of coconut crab "Tatus"
	Kambiling (naked island), Tangbo, Garcia, Rizal, Alegria, T Arlan, Magsaysay, Abad Santos	Fringing Reef/ Seagrass Beds
General Luna	Malinao, Sta. Cruz	Beach area/forest
	Tawin-Tawin, Malinao, Magsaysay, Santa Cruz, Libertad, Catangnan, Cabitoonan	Mangrove forest and fauna (tarsier)
	Sta. Fe and Sta. Cruz, Libertad (Pangitlogan Island)	Nesting sites of marine turtle
	Poblacion, Daku, Malinao, Suyangan, Anajawan	Marine Sanctuary
	Libertad and Sta. Fe	Underwater Cave (Blue Cathedral)
	Tuazon Reef	Poot-poot habitat
	Daku, Guyam, Naked, Suyangan	Beach Area
	Pansukian, Guyam, Daku	Fringing reef
	Pob. 1,3,5, Catangnan, Daku, Sta. Fe, Libertad, Sta. Cruz, Cabitoonan, Malinao, Suyangan, La Janusa, Anajawan	Seagrass beds

Municipality	Barangay	Features of the Area
Burgos	Lakyajon (Pob.1), Bayud (Pob.2), Kugiton City	Marine Protected Area (MPA)
	Baybay, Bitaug, Poblacion 1, Poblacion 2	Patch Reef
	Poblacion 1	Coconut crab "Tatus" sightings
	Baybay, Pob. 1 and 2, Bitaug	Seagrass beds

Source: SIPLAS PAMO, CY 2020

➤ Effective MPA management

One of the most important management measures for the coastal and marine environment would be effective MPA management. Individual MPAs and MPA networks will all be targeted for interference.

Improved MPA management

One of the priority interventions is to improve Marine Protected Area (MPA) management in SIPLAS through individual MPA and MPA networks.

Management of individual MPAs

SIPLAS currently has twenty (20) MPAs, wherein the LGUs will create thirteen (13) more MPAs during the plan period as listed in Table 75.

Targeted activities for the MPAs include:

- Validation and mapping of all MPAs' technical coordinates;
- Using buoys to demarcate the MPA borders if resources are available;
- Completion and/or revision of the relevant MPA Plans;
- Evaluation and improvement of the local MPA ordinance to provide correct technical coordinates, management procedures, and annual operational budgets; and
- Formation of the MPA's functional management body

Table 75. Existing and Proposed Marine Sanctuaries in SIPLAS

Municipality	Existing		Proposed*		Total	
	No.	Hectares	No.	Hectares	No.	Hectares
Burgos	1	31	1	27	2	58
San Benito	2	111	-	-	2	111
Dapa	1	149	2	189	3	338
Del Carmen	3	104.5	1	78	4	182
Gen Luna	1	500	5	165	4	777
Pilar	2	139			2	139
San Isidro	1	28	1	34	2	62
Sta. Monica	3	199.87	3	161	6	360.87
Socorro	6	176				176
Total	20	1438.37	13	654	33	2203.87

Sources: SCREMP CY 2015; Results of LGU Consultations on SIPLAS Management Zones CY 2021;

* Based on the results of the Coastal Zoning conducted by RARE, Philippines CY 2021;

Each of these operations will be carried out by a participatory process involving the affected communities as well as municipal and barangay leaders. These operations will be overseen by the LGU in charge of the coastal resource and fisheries management system.

For the first three (3) years, related activities will be conducted and targeted for the proposed MPAs such as stakeholders' consultation to determine the extent of the MPA and ensure that agreement on the management of these areas will be assigned to concern stakeholders and such will be the basis for designating the area as MPAs. It is critical that stakeholders consider the intent of creating MPAs, the consequences for their fishing activities, and their roles as resource managers.

The concerned LGU must update each MPA's management plan prior to its endorsement to the PAMB for finalization. Each MPA will be overseen by a local management authority. These MPAs will be supported by local ordinances that specify the duties and accountability of these management bodies, provide routine budget funding from the municipal or barangay LGU for the execution of the MPA Plan, and establish a compliance and monitoring mechanism. The MPA ordinances must also specify the actions that are prohibited within the MPA, as well as the penalties and punishments that would be charged on the offenders.

Following the establishment of these MPAs, the SIPLAS PAMO and the LGUs will use the MPA Monitoring Effectiveness Assessment Tool or MEAT (*National CTI Coordinating Committee, 2011*), to track the management success of the current MPAs on a regular basis against threshold indicators.

The Management Effectiveness Assessment Tool (MEAT) offers prescribed indicators to direct MPA development at four (4) levels of management effectiveness as presented in Table 76.

Table 76. MPA MEAT Threshold Indicators

Level 1. Established (Year 1)	Level 2. Strengthened (Year 5)	Level 3. Sustained (Year 7)	Level 4. Institutionalized (Year 7 onwards)
<ul style="list-style-type: none"> • Baseline assessment conducted • Management plan adopted • Legal instrument approved • Management body formed and roles clarified • Budget allocated for at least one year 	<ul style="list-style-type: none"> • Patrolling and surveillance conducted regularly • Violations documented • Cases filed/violators penalized 	<ul style="list-style-type: none"> • Funds generated /accessed for last two years • Enforcement system fully operational • Performance monitoring of the management body conducted regularly • Regular participatory monitoring • Violators prosecuted and sanctioned 	<ul style="list-style-type: none"> • MPA/NIPAS Management Plan incorporated in broader development plans • Ecological and socioeconomic impact assessment conducted • Performance monitoring and evaluation linked to an incentive system • IEC sustained over five years • MPA/NIPAS financially self-sustaining

Level 1= established; Level 2 = strengthened; Level 3 = sustained; and Level 4 = institutionalized.

SIPLAS' annual MPA strengthening goals for the plan duration would therefore be based on fulfilling the prerequisites and threshold indicators. Individual MPAs should aim to achieve Level 1 (established level) within a year of being established, and Level 2 (strengthened level) by the end of the plan period. In the succeeding SIPLAS management strategy, MPAs should aim for Levels 3 and 4.

Operationalization of MPA Network

The nine (9) LGUs in SIPLAS have agreed to form an MPA network to improve inter-connectivity of MPAs and increase performance, complementation, and coordination among different MPA management bodies and the Municipal LGUs, Provincial LGU and the SIPLAS PAMB Chair/DENR. Memorandum of Agreement (MOA) was forged among the concerned management body to collaborate activities on CEPA, enforcement, and unified fishery ordinance.

The MOA reflected the LGUs' dedication to control and secure SIPLAS waters across MPA networks in a cooperative and efficient manner. By consensus building, the MOA indicate the responsibilities of the networked member LGUs and the PAMB, as well as the network structure and budget for the network's MPA management operations. It's worth noting that the budget for the MPA network would be distinct from the budget for individual MPA management.

The SIPLAS MPA Network MOA worked-out that the whole protected area be connected through a single network. LGU members, on the other hand, can choose to form clusters. The biological features of corals and reef fishes, which vary between the eastern and western sections of SIPLAS, have been proposed as a basis for clustering. On the basis of this, the clusters could be:

- Northeast cluster composed Burgos, San Isidro, Pilar and General Luna; and
- Southwest cluster: composed of Sta. Monica, San Benito, Del Carmen, Socorro and Dapa.

This plan for clustering corresponds to the areas' susceptibility to powerful Pacific Ocean waves, which has an effect on the form and state of their coral reefs.

The SIPLAS MPA network will work to improve the MPA management even further. Table 77 provides specific activities that will be undertaken through the MPA network arrangement. The SIPLAS MPA network action plan was formulated on CY 2018 to supplement the activities of the individual MPA management organizations. The MPA network serve as a forum for resource exchange, policy harmonization, sharing of perspectives and best practices, and overall evaluation of the MPA program. It will host an MPA Forum once a year, where good practices and lessons learned from MPA management events, as well as MEAT outcomes, will be provided as contributions to the next year's planning process.

Table 77. MPA Network Activities

Enforcement	M and E	Advocacy and IEC
<ul style="list-style-type: none"> • Creation of enforcement group/team or Coastal Law Enforcement Agreement with external agencies (e.g., PNP, Coast Guard) for effective policing and 	<ul style="list-style-type: none"> • Creation of M and E group/team; • Setting-up of joint M and E Establish protocols for administrative, socio- 	<ul style="list-style-type: none"> • Creation of IEC group/team; • Development of strategies and key communication messages/ IEC plan; • Community IEC;

Enforcement	M and E	Advocacy and IEC
<ul style="list-style-type: none"> enforcement of fishery and protected area laws and ordinances; • Law enforcement and paralegal training; formulation of enforcement plan; • Deputizing Bantay Dagat and fish wardens; • Development of community involvement in reporting violations 	<ul style="list-style-type: none"> economic and biophysical M and E; • Training on participatory coral and fish surveys, and MEAT; • Analysis of M and E findings on representative sites within network; • Periodic MPA network forum for feedback of M and E results and action planning 	<ul style="list-style-type: none"> • Advocacy for support of key stakeholders and private sector; • Promotion of responsible tourism in local areas

Source: SIPLAS PAMO, CY 2020

The network's development goals would be based on the same requirements and thresholds as the MEAT. The Network Effectiveness Assessment Tool (NEAT) is the appropriate evaluation tool for the MPA Network. The MPA network will be evaluated on four levels: Level 1=established; Level 2=strengthened; Level 3=sustained; and Level 4=institutionalized. There are specific threshold indicators for each level as shown in Table 78. The threshold indicators can also be classified into the following management areas: (a) formal agreement/legislation; (b) management body; (c) financing and fund management; (d) joint activities; (e) expansion activities; (f) monitoring and evaluation; and (g) feedback mechanisms.

Table 78. MPA NEAT Threshold Indicators

Level 1. Established	Level 2. Strengthened	Level 3. Sustained	Level 4. Institutionalized
<ul style="list-style-type: none"> • Formal agreement (MOA) signed and notarized • Operational protocols finalized and approved • Management body formed with regular meetings • Budget allocation for at least one year • Financial management system finalized • Network action plan drafted • Initial joint activities conducted 	<ul style="list-style-type: none"> • Harmonized CRM-related ordinance approved • Regular meetings (at least quarterly) • Management body trained and skilled • Performance assessment initiated • Regular allocation, access and utilization of funds • Sustainable financing plan prepared • Discussions with external groups for possible assistance • Network strategic plan approved • Joint activities conducted regularly • Regular reporting and feedback mechanisms conducted • Monitoring system established 	<ul style="list-style-type: none"> • Review and updating of MOA, protocols, strategic plan and/or ordinances • Regular meetings (at least quarterly) for the last five years • Funds consistently allocated, accesses and used in the last five years • Fund sourcing activities regularly conducted • Expansion activities initiated • Regular performance monitoring • Feedback system in place • Benefits from joint activities observed in member barangays/municipalities/cities 	<ul style="list-style-type: none"> • Provincial/regional/congressional support • Incorporation of network strategic plan into broader development plans • Regular meetings (at least quarterly) for the last seven years • Performance M and E linked to an incentive system • Expansion activities conducted • Financial sustainability (both internal and external sources)

➤ **Coral rehabilitation**

Coral restoration efforts started in SIPLAS in CY 2013 in collaboration with Local Governments Units and MPA management bodies, particularly when it comes to identifying coral areas that need to be rehabilitated. Artificial reef modules can be placed in locations where there are no hard substrates for corals to land on, increasing the number of substrates for corals to stick to or settle on. A total of 2,000 Artificial Reefs (ARs) were installed in the nine (9) municipalities in SIPLAS in CY 2015.

These ARs were placed in completely protected areas or within the established no-take zones of the nine (9) MPAs in SIPLAS. Monitoring of the ARs are conducted annually and per observation, these serve as coral recruitment areas as shown in Figure 25. Further protection of these ARs is undertaken since these are included in the core zone of the MPA.

Installation of ARs will be targeted in the remaining eleven (11) existing and thirteen (13) proposed MPAs. Coral rehabilitation plan and funding proposal for this activity will be prepared through a participatory process and will be submitted to the funding institutions. Coral rehabilitation and response plan will be participated by the community so as to establish ownership and ensure protection of these ARs.

➤ **Mangrove conservation and restoration**

Mangrove conservation and regeneration would be a top priority for SIPLAS, given its importance in protecting fishing communities' wealth and acting as natural buffers against climate change impacts including storm surges. Approximately 9,370.125 hectares of mangroves will be preserved, rehabilitated, and conserved as a result of this initiative. With the active involvement of barangay LGUs, enforcement activities in mangrove areas will be increased.

The Enhanced National Greening Program (ENGP) targeted mangrove rehabilitation and restorations from CY 2015 to CY 2018 through the Mangrove and Beach Forest Development Program (MBFDP) to date, a total of 2,227.39 hectares of mangroves and beach forest areas were rehabilitated and maintained.

In CY 2020, SIPLAS PAMO conducted mangrove inventory in SIPLAS and recorded twenty-five (25) mangrove species dominated by *Rhizophora apiculata* (Bakhaw lalaki) followed by *Rhizophora mucronata* (Bakhaw babae) as presented in Table 79. High level of biodiversity index in Del Carmen and General Luna while Pilar and Dapa recorded with moderate diversity values. In terms of evenness index (e), all the municipalities within SIPLAS fell within very high and high scale except in the municipality of Del Carmen which fall under the moderate level. This indicates that the mangrove species are distributed within SIPLAS.

Table 79. Taxonomic profile of mangrove species observed and identified in the nine (9) municipalities of SIPLAS for CY 2020.

Family	Species	Local Name
Myrsinaceae	<i>Aegiceras corniculatum</i>	Saging-saging
Avicenniaceae	<i>Avicennia alba</i>	Miapi
	<i>Avicennia marina</i>	Bayabason
	<i>Avicennia officinalis</i>	Api-api
	<i>Avicennia rumphiana</i>	Bungalon
Tiliaceae	<i>Brownlowia tersa</i>	Maragomon
Rhizophoraceae	<i>Bruguiera cylindrica</i>	Busain
	<i>Bruguiera gymnorhiza</i>	Pototan
	<i>Bruguiera parviflora</i>	Langarai
	<i>Bruguiera sexangula</i>	Karakandang
	<i>Ceriops tagal</i>	Tungog
	<i>Ceriops zippeliana</i>	Baras-baras
	<i>Rhizophora apiculata</i>	Bakhaw lalaki
	<i>Rhizophora mucronata</i>	Bakhaw babae
	<i>Rhizophora stylosa</i>	Bakhaw bato
Sterculiaceae	<i>Heritiera littoralis</i>	Dungonlate
Combretaceae	<i>Lumnitzera littorea</i>	Tabao
	<i>Lumnitzera racemosa</i>	Culasi
Arecaceae	<i>Nypa fruticans</i>	Nipa
Lythraceae	<i>Pemphis acidula</i>	Bantigi
Rubiaceae	<i>Scyphiphora hydrophyllacea</i>	Nilad
Sonneratiaceae	<i>Sonneratia alba</i>	Pagatpat
	<i>Sonneratia ovata</i>	Pedada
Meliaceae	<i>Xylocarpus granatum</i>	Tabigi
	<i>Xylocarpus moluccensis</i>	Piag-ao

Source: SIPLAS PAMO Mangrove Forest Monitoring: Threat Focused, CY 2021

For mangrove sustainability, protection activities include the conduct of monthly LAWIN parolling, CEPA at the barangay level shall be undertaken, implementation of enhance BDFE, promotion of the area as eco-destinations.

Eco-destinations include the mangrove view deck and board walks showcasing the panoramic view of the vast mangrove forest. Ecotourism products will include mangrove eco-tour, paddle boarding, nature trips, photography, and aerial drone shots. Site specific mangrove eco-tourism management plan will be formulated. Community based eco-tourism management is encouraged wherein the local community will serve as the host and service provider.

Fisheries management

SIPLAS has recurring threats and issues in the environment wherein concerned agencies identified some areas for improvement in addressing these issues through the formulation and mobilization of SIPLAS Inter-Agency Law Enforcement Cooperation (SIALEC) which is the major arm under the SIPLAS PAMB Sub-Committee on Law Enforcement. The SIALEC is formed for coordination and enhancement of implementation of the environmental law in SIPLAS.

The following actions will be used to improve fisheries law enforcement as part of fisheries management:

- The formation and operationalization of SIPLAS Inter-Agency Law Enforcement Cooperation (SIALEC) under a Memorandum of Understanding (MOU) of which fishery enforcement is one of the focus. This would reinforce LGU commitments to harmonize ordinances, enact consistent compliance procedures and processes, and budget for enforcement on a routine basis.
- Solidification and reactivation of municipal and barangay Fisheries and Aquatic Resource Management Councils (FARMCs) in all LGUs.
- Purchase of law enforcement vehicles and supplies, such as patrol boats and communications equipment.
- Reinforced Bantay Dagat teams to conduct routine patrol activities. With the support of the Bureau of Fisheries and Aquatic Resources (BFAR) and other law enforcement agencies including the Philippine National Police, Maritime Police and the Coast Guard, enforcement trainings will be held. Bantay Dagat team members will be hired as enforcers.
- Adoption and sustaining of fisheries registration and licensing schemes that are harmonized or standardized. This will determine the number of fishers permitted to operate in the area, as well as the fishing equipment that they can use in SIPLAS waters. This will also determine the penalties and punishments for offenses, as well as any rewards offered to those who assist in enforcement efforts.
- Enforcement of municipal ordinances to stop destructive fishing in the area. These ordinances will also protect activities that aren't addressed in the Fisheries Code but are observed in SIPLAS (e.g., fishing for abalone which disturb and is destructive to coral reefs).

The LGUs in the northeastern part of SIPLAS need to consider a system for declaring "closed season" for fishing during the spawning season of major species. To implement this, the important species must first be identified. Initial species include surgeonfishes and parrotfishes, both of which promote reef resilience. According to available literature, these species spawn during the calmer periods (April-May) or during the inter-monsoonal periods (July-October). The LGUs and local communities will have to agree on a period for the necessary "closure" of fishing for these species, which will be guided by a marine biologist with experience in reef fisheries. The supply chain must be taken into account so that the fishermen's income is not negatively affected. Both fishermen and consumers must recognize the significant beneficial effect or contribution that a temporary fishing closure will have on the environment and, ultimately, their livelihoods.

Socio-economic development

The emphasis of this component will be on assisting and encouraging fishermen to pursue alternative livelihoods (not related to fishing) or to expand current mariculture or aquaculture operations, such as fish farming in fish cages. Grants accessible from BFAR and other organizations for aquaculture enterprises can be tapped.

Providing seed capital to fisherfolk organizations as start-up tools for non-fishery-based businesses would be crucial in encouraging people to switch to or seek other sources of income. The aim is to reduce fishing effort and thereby solve the problem of overfishing. Cocoa-sugar production, fruit/food processing, mat weaving, poultry, piggery, and aqua silviculture technology can all be taught to fishermen. Fishermen may be qualified to provide services that would be used in coastal eco-tourism.

Coastal communities/fisherfolk, on the other hand, would need to be professionally structured and educated in biodiversity friendly enterprises, business growth, leadership, and financial management. LGUs, other national agencies, and the private sector will be solicited to help with this program.

In summary

The whole coastal and marine resources management mentioned above can be summarized in relation to the findings of the vulnerability evaluation using the TURF for the LGU northwest and southeast clusters as shown in Table 80. These measures provided the details of the climate change adaptation strategies for fisheries, reef ecosystems, and the program's socio-economic components.

Table 80. Adaptation Strategies Based on the Output of the VA-TURF Approach

Component	Potential Impact	Adaptive Capacity	Adaptation Strategies	Specific Measures
A. Southwestern Cluster (Dapa, Del Carmen, San Benito, and Socorro)				
Fisheries	Dominant catch	Change in catch composition	Fish size restriction; regulation of fishing effort and fishing gear types	Banning of all destructive fishing gears (Municipalities of San Benito, Del Carmen, Dapa)
	Gear dependence	Habitat condition	Fishing gear restrictions (thru unified fisheries ordinance)	1) Strengthening of MPAs (two in San Benito, three in Del Carmen) 2) “Coral rehabilitation” in San Benito and Del Carmen 3) Mangrove reforestation in San Benito and Del Carmen
Reef ecosystem	Abundance of wave tolerant species	Extent of habitats	Establishment of MPAs (e.g. coral reefs, mangroves and seagrasses)	Strengthening of all MPAs and to include corals, mangroves and seagrass beds as no-take zones (e.g. Sta. Monica, Del Carmen, San Isidro, Dapa)
Socio-economic	Fisheries ecosystem dependency	Increase percentage of fishers with alternative livelihood; increase income from other sources not related to fishing	Reduction of fishing effort	Encourage intercropping farming system to have whole year farming activities in San Benito, Del Carmen and Sta. Monica, Dapa Initiate Biodiversity-Friendly Enterprise (BDFE) as alternative livelihood
			Close and Open season Catch Per Effort Unit	
B. Northeastern Cluster (Burgos, San Isidro, Pilar, General Luna, and Sta. Monica)				
Fisheries	Dominant catch	Change in catch composition	Fish size restriction; regulation of fishing effort and fishing gear types	Banning of all destructive fishing gears (Municipalities of San Benito, Del Carmen, Sta. Monica)
	Catch rate	Size and amount of fish caught	Establishment of catch quota	Close season during spawning period

Component	Potential Impact	Adaptive Capacity	Adaptation Strategies	Specific Measures
	Gear dependence	Habitat condition	Fishing gear restrictions	1) Strengthening of Bantay Dagat 2) Conduct regular seaborne patrol 3) Law enforcement and paralegal training
Reef ecosystem	Abundance of wave tolerant species	Extent of habitats	Establishment of MPAs (e.g. coral reefs, mangroves, seagrasses)	Strengthening of all MPAs including the mangrove sanctuary
	Habitat quality	Presence of adjacent habitats	Expansion of MPAs to include other habitats (e.g. coral reefs, mangroves, seagrasses)	1) Coral rehabilitation in Pilar 2) Mangrove reforestation in Pilar and Gen Luna
Socio-economic	Fisheries ecosystem dependency	Increase percentage of fishers with alternative livelihood; increase of income from other sources besides fishing	Reduction of fishing effort	Provide alternative livelihood programs (e.g. coco-sugar, mat webbing, poultry, piggery, post-harvest production e.g. processed fruits) and aquasilviculture <ul style="list-style-type: none"> • Ecotourism

Source: SIPLAS PAMO Focus Group Discussion, CY 2021

6.2.3 Cross-Cutting Management

Eco-tourism Development

The SIPLAS is known as one of the major eco-tourism destination in Mindanao and the country as a whole. The eco-tourism development is one of the major thrusts of the SIPLAS Management Plan. SIPLAS has zoned approximately 1,713 hectares (overall eco-destination area) of marine, coastal, and terrestrial areas as eco-tourism destinations. There are 52 eco-sites and attractions as listed in Annex 14 that to be assessed for eco-tourism development, growth, and promotion and to align eco-tourism efforts of various sectors, especially infrastructure development, use regulations and user's fee systems.

This program would include assessment and site specific eco-tourism management plans for these sites including caves and wetlands in SIPLAS. The evaluation of eco-tourism sites should consider also eco-tourism areas that are currently visited by tourists in order to decide if the physical growth and promotion of these areas are in line with and advance the environmental objectives of the SIPLAS management plan. This project should include, and possibly be financed by, the Provincial Local Government and/or the Department of Tourism (DOT).

This implies that the CY 2015 SIPLAS Ecotourism Development Plan will be updated to reflect the agreed-upon prioritization and promotion strategies. A planning and management strategy, as well as a business plan, will be planned for each eco-tourism site. The protection of biodiversity resources and the promotion of responsible tourism should be emphasized in these management plans. Co-management agreement will be forged to those in charge of these ecotourism areas, whether they be local governments, communities, or private businesses with the SIPLAS PAMB. The PAMB will also review and approve management plans for eco-tourism areas. The performance of these eco-tourism site operators in relation to plans will be evaluated on a regular basis.

Community participation in eco-tourism programs will be promoted and encouraged. Specific events in which the community can participate will be established, and community planning and capacity-building trainings will be programmed and conducted to these communities. Present activities in existing eco-tourism sites (e.g., Sohoton Cove and Sugba Lagoon where people's organization members serve as boatmen and tour guides) should be studied in order to improve on the arrangements and to replicate and learn lessons from the experiences of communities.

Implementation of the result of the carrying capacity studies conducted in Sugba Lagoon, Sohoton Bay, Cloud-9, Magpupungko Beach and Rock formation, and General Luna small islands and Islets will be carried-out. Further, carrying capacity studies will be conducted in the eco-sites listed in Annex 14.

The Provincial Local Government Unit (PLGU) and the Department of Tourism (DOT) are expected to sustain the promotion of Siargao Islands as an ecotourism destination. Linkages with the Mindanao Chamber of Commerce and Industry, and national and regional tourism organizations will be strengthened.

Relevant areas defined by the LGUs for biodiversity conservation and sustainable use are mentioned in Table 81. These areas will be evaluated further and given priority as part of this initiative.

Table 81. Terrestrial Areas Identified for Biodiversity Protection, Rehabilitation and Conservation and/or Sustainable Use

Municipality	Barangay	Features of the Area
Dapa	Lobo (Sta. Fe), Cataba-an, Osmeña and Alimbungog	Natural forest
	Don Paulino	Laksohon Cove and Cave
	Consolacion	Magkahoyog Falls
	Osmeña	Wetland
	Union, Don Paulino, Bagakay and Hagimit Cambas-ac	Watershed/Spring
	Brgy.12, Don Paulino, Corregidor, Osmeña	Caves
Socorro	Sudlon, Mahambong, Calangugan	Natural Forest
	Del Pilar	Forest Park
	Kanlangugan and Mahambong, Salog	Watershed
	Dona Helene, Sohoton	Limestone Forest
	Kabayao (Brgy. Salog)	Gene Bank of Ironwood
	Sohoton Gamay, Sudlon, Sta. Cruz, San Roque	Caves
	Buajjahan	Crystal and Inland Lakes
	Kwaknitan and Tiktikan lake	Inland Lakes
	Salog, Kawasi-Pamosaingan	River system/creek
	Kanlanuk, Magkahuyog	Waterfalls
San Benito	Bubon islet, Isla Giti, Hidden Island,	Islets
	San Juan, Talisay	Watershed
	Bongdo, Nuevo Campo	Forest
	Poenas Island (Brgy. Maribojoc)	Hilltop Ridge
	Maribojoc	Poneas Lake
	Kangkangon, Pagbasayan, Litalit, Kambiling	Islet
	Maribojoc, Talisay, San Juan, Bongdo	Caves
Del Carmen	Jamoyaon, Bagacay, Cancohay, Katipunan, Esperanza, Mahayahay, Tuburan, Antipolo, Lobogon	Watershed
	Caub, Poneas Island and Tona	Natural forests and fauna
	Tuburan	Marshland
Pilar	Jaboy, Mabuhay, Katipunan	Marshland
	San Roque, Jaboy, Datu	Patch forest
	Magpupungko, Pilaring, Caridad	Beach forest
	Maasin to Katipunan	Hilltop Ridge
	Katipunan	Spring
Pilar	Corazon, GL to Katipunan	Marshland

Municipality	Barangay	Features of the Area
	San Roque	Watershed
	Datu, Maasin, San Roque	Cave
	Maasin	River System
San Isidro	Sta. Paz, Macapagal, Roxas, Sto. Nino, Tambacan, and Del Pilar	Natural Forests and fauna, Watershed
	San Miguel, Buhing Kalipay, Del Pilar, Pacifico, Roxas, Pelaez, Bayatakan, Bulacan	Marshland
	San Miguel	Tarsier and Important Wildlife Fauna Habitat
	Del Pilar and Pacifico	Cave
	Tigasao, Pacifico	Beach forest
	Del Carmen	River System
Sta. Monica	Mabini, Libertad, Bailan	Forest area
	Mabuhay, Bailan, Rizal, Magsaysay, Tangbo, Alegria, Garcia, Libertad, Mabini	Watershed area
	Tangbo (Danjug), Libertad (Bat Sanctuary), Alegria, Mabini, Magsaysay, Abad Santos, Bailan, Garcia	Caves
	Alegria, Tangbo, Garcia, Rizal	Beach Forest
General Luna	Malinao, Sta. Cruz, Sta. Fe, Libertad, Cabitoonan, Catangnan, Pob. 1,3,5, Daku, La Janusa, Suyangan, Anajawan,	Beach area/forest
	Consuelo, Malinao, Corazon, Sta. Cruz, Magsaysay	Natural Forest and Fauna
	Consuelo, Daku, Corazon, Malinao, Sta. Cruz	Cave
	Malinao, Corazon, Tawin-Tawin, Consuelo	Marshland
	Naked Island, Guyam Island, Pangitlogon (Sta. Fe), Hanuyoy (Malinao), Rock Island, Mam-on	Islets
Burgos	San Mateo, Matin-ao	Marshland
	Patag, Poblacion 2, Poblacion 1(Mag-aso), Baybay, Matin-ao, San Mateo	Caves
	Poblacion 1, Baybay, Bitaug, San Mateo	Natural forest
	Pob. 1,2, Bitaug, Baybay	Beach forest

Source: SIPLAS PAMO Focus Group Discussion, CY 2021

Existing Developments

In CY 2019, Siargao Island Environmental Monitoring Team (SIEMT) known as “Task Force Siargao” was created to conduct monitoring and assessment in compliance to environmental laws, rules and regulations by the existing establishments and developments within the nine (9) municipalities in SIPLAS.

The task force Siargao assessment anchored on the following policies: Easement, Solid Waste Management, Clean Water Act, settlements within mangrove areas, quarrying, and reclamation/embankments.

The assessment lasted for three (3) years wherein the 1st wave was conducted on March 18-31, 2019 in the municipality of General Luna; 2nd wave was conducted on January to February 2020 in the municipality of Dapa; and the 3rd wave was conducted on September 6 to October 29, 2021 in the remaining seven (7) municipalities. The results of the assessment are subject for further assessment and analysis based on the existing rules and regulations. The initial result of the assessment is shown in Table 82.

Table 82. Initial result of Task Force Siargao assessment in nine (9) municipalities in SIPLAS CY 2019-2021

Municipality	No. of Establishment Assessed	With Legal easement	Percentage
General Luna	1,298	250	19%
Dapa	2,380	511	21%
Del Carmen	2,223	812	36%
San Benito	738	465	63%
Burgos	95	63	66%
Pilar	2,300	1,048	45%
San Isidro	242	15	6%
Sta. Monica	439	320	72%
Socorro	1,326	122	9%
Total	11,041	3,606	32%

Source: DENR Region XIII, Task Force Siargao assessment Report, CY 2021

Further, special uses within protected areas may be allowed except in strict protection zones. The SIPLAS PAMB recommends the issuance of the Special-Use Agreement in Protected Area (SAPA) to a proponent for the use and development of land, water and ecosystem resources or facilities within the Multiple Use Zone of SIPLAS subject to the compliance with the requirements of the PAMP, the EIS System, and payment of annual Development fee. Provided, that the activity shall not be detrimental to the ecosystem functions and biodiversity, and cultural practices. To date, there are already eleven (11) MOA holders subject for SAPA conversion covering an area of approximately 52.6468 hectares.

Waste Management

With the increasing number of resorts and other recreational facilities in Siargao Islands, and the influx and local and foreign tourist, it is imperative that efficient Solid Waste Management (SWM) and Waste-Water Management (WWM) systems be implemented. The LGUs will have to comply with the Ecological Solid Waste Management Act and the Clean Water Act.

The nine (9) LGUs in SIPLAS has already an approved Solid Waste Management Plan that shall be monitored. Technical assistance for a cluster sanitary landfill (i.e., a single facility for a group of LGUs) as well as cost-effective waste diversion and collection systems will be tapped from DENR-EMB 13 and experts. The assessment of alternate sanitary landfill sites, the building of consensus among LGUs on management arrangements (i.e., hosting of the facility) and user fees, the signing of a formal agreement among the concerned LGUs, and the engineering design of the facility are all part of the planning for a cluster sanitary landfill. LGUs will be expected to enact supporting ordinances, provide incentives and intensify campaign to promote solid waste segregation at source, waste diversion by on-site composting and recyclables processing, and proper disposal of plastic products. As the new cluster landfill facilities are being prepared and built, interim plans for solid waste disposal (not in open dumpsites) may need to be addressed. The SIPLAS PAMO through the DENR-EMB 13 and the LGU MENROs would have to work together to improve the project and secure funds.

Implementation of Executive Order and Municipal Ordinances on banning of single use plastic will be strengthened and strictly imposed in SIPLAS.

On WWM, a rapid assessment of public and private facilities that generate significant volume of wastewater should be undertaken to determine the current wastewater disposal practices and estimate the volume of wastewater generated by these sources. The assessment will cover public markets, slaughterhouses, hospitals, schools and large tourism establishments and hotels. The appropriate decentralized or shared wastewater treatment facilities will be prescribed for these establishments. Technical assistance for a wastewater management specialist may be required for the training of the engineering staff of the LGUs on the design of these facilities, for the assessment of the sites for these facilities and the review of the engineering designs, and for the supervision of the construction of these facilities. The PASu and the LGU MENROs will again need to develop the funding proposal for this.

Establishment of Sewage Treatment Plant (STP) is imperative in SIPLAS to ensure that clean waste water or discharge will be released in the environment. The formulation of feasibility study or proposal on STP will be undertaken and technical experts will be tapped for these activity.

For households, the LGUs should actively promote and support the establishment of sanitary toilets and the correct design and construction of septic tanks. Households, collectively, are the major source of wastewater. This effort will aim to reduce the risk of pollution water bodies and contaminating groundwater resources.

User fee systems will be established for both SWM and WWM. Revenues from the organized collection of solid waste, tipping fees, fines and penalties should be able to partially or fully support the provision of these services.

Disaster Risk Reduction Planning

Local governments units shall implement Disaster Risk and Reduction Management (DRRM) programs and shall set aside funds for DRRM on an annual basis. Based on the findings of the SIPLAS vulnerability assessment, municipal and barangay officials and local communities shall be engaged in formulating specific actions that they can take to avoid loss of lives and minimized damages to property, livelihood, and infrastructure due to climate hazards such as flooding, landslides, and storm surges. Technical support will be extended in the review, updating, and improving DRRM plans in light of the risk assessments of each LGUs. These DRRM planning should be implemented at the barangay level. DRRM preparation assistance would be prioritized for barangays that are especially vulnerable to various hazards. Technical expertise in designing and preparing barangay DRRM plan could be tapped.

DRRM covers emergency prevention and mitigation, preparedness, response, reconstruction, and recovery. The disaster risk reduction planning exercise would place a special emphasis on disaster avoidance, primarily to minimize the vulnerability of settlements and livelihoods to climate hazards. Land use planning would be one of the measures implemented, allowing for limits on future construction and settlement growth in hazardous areas. As a solution for coastal towns, this measure is included. The conversion of the solution into an ordinance, as well as its implementation, would be needed. Other initiatives include relocating vulnerable villages, slope stabilization to deter landslides, mangrove conservation and regeneration to defend coastal areas from storm surges, and emergency preparedness. DRRM requires a significant amount of CEPA.

Disaster preparedness will be emphasized as well. Awareness-raising, the establishment of an early warning system and secure evacuation centers, the formulation of evacuation plans, exercises, and volunteer preparation will be part of the plan and shall be implemented sustainably through the support from Non-Government Organizations operating in the island such as *Sentro para sa Ikauunlad ng Katutubong Agham at Teknolohiya* (SIKAT) Incorporated.

Table 83 summarizes the areas of each major resource use by municipality.

Table 83. Area of Resource Uses by Municipality

Type of resource uses	Area (hectares)									
	Burgos	Dapa	Del Carmen	General Luna	Pilar	San Benito	San Isidro	Santa Monica	Socorro	Total
TERRESTRIAL	1,765.63	3,780.87	10,590.52	5,820.10	8,719	3,316.40	4,412.53	3,418.77	13,502.18	55,390.09
Agricultural Area	1,299.288	4.908.35	4,243.97	2,917.82	3,631.57	812.03	2,383.07	2,522.31	2,214.5224	20,024.58
Agroforestry	71.075	1,067.27	2.977.12	308.81	2,862.88	9.002	1,349.66	12.37	3,453.930	9,132.02
Commercial Areas	10.83	57.97	0.69			2.66		69.77	0.54	69.77
Eco-Tourism	3.82	599.09	65.37	909.64	78.74	25.7	12	194.427	1,200	3,088.79
Fuelwood Production		43.62	51.66		28.1			63.62		187
Infrastructure	6.712	197.97	157.60	0.12		7.15		6.89		171.76
Mangrove Areas	0.125	774	4,478	640	1,406	1,406	27	54	492	9,277.00
Marshland	7.539			10.29	20.15		5.51			43.49
NGP/ Restoration sub zone	65.72	677.93	1,466.81	209.09	902.13	188.87	59.97	29.91	2,357.84	2,821.52
Quarry	0.34	10.29				6	4.0			20.63
River					347.87	4	26.88			374.75
Settlements	51.566	115.39	702.17	57.59	92.66	11.30	19.18	260	255.9776	1,565.71
Water Source	1.31						14.46			15.77
Watershed Management	16.28	737.96		514.75	66.3		279.61	299	697	2,160.90
Strict Protection Zone	248.69	433.25	891.75	251.99	185.2	850.35	291.16		2,830.91	5,326.47

Type of resource uses	Area (hectares)									
	Burgos	Dapa	Del Carmen	General Luna	Pilar	San Benito	San Isidro	Santa Monica	Socorro	Total
MARINE	76.93	1,644.69	46,296.66	616.61	119	280	35	790.84	363.40	50,223.13
Marine Areas for Fisheries Mgt/Cage, Navigation, Seaweed Production		906.72	46,094.10					4.36	0.93	912.01
Strict Protection Zone	28.8	540.33	202.56	616.61	119	280	35	199.87	53.84	2,076.01
Strict Protection Zone - Buffer	48.13	197.64				58.74		586.61	308.63	1,199.75
Grand Total	1,842.56	5,425.56	56,887.18	6,436.71	8,838.47	3,596.40	4,447.53	4,504.72	13,865.58	105,613.22

Source: SIPLAS PAMO cited from SIPLAS Management Plan CY 2015-2020

Communication, Education, and Public Awareness (CEPA)

To achieve the protected area management plan's priorities and objectives, a coordinated and intensive Communication, Education, and Public Awareness (CEPA) campaign is required, with the aim of reaching the majority, if not all, of SIPLAS' stakeholders. The CEPA's ultimate goal is to raise awareness about SIPLAS and its importance, as well as to pique stakeholders' interest in participating in and contributing to conservation, security, and management efforts.

The five (5) year SIPLAS Communication Plan (CY 2019-2023) was crafted with the objective to:

- a) Raise awareness at least 50% of PA recipients on ecosystem services provided by SIPLAS as a protected area and measure to ensure that such ecosystem services are continuously provided in five years;
- b) In 2023, 50% of LGUs will increase awareness on benefits gained from SIPLAS and secure their continuing commitment to support SIPLAS through regular budget allocation for SIPLAS, harmonized zoning, policy and enforcement support, among others;
- c) For terrestrial conservation objective: within five years of Communication Advocacy, 60% timberland users' holders reverse their negative attitudes on environmental issues, practice sustainable agriculture and develop high conservation practices;
- d) For marine conservation objective: 60% of the households per municipality properly practice 6Rs (Reuse, Recycle, Refuse Remanufacture, Redesign) by 2023; and
- e) At least 6 MPA's in SIPLAS are protected against intruders by 2023.

The CEPA initiatives could cover a wide range of topics related to SIPLAS management, such as the importance of biodiversity in SIPLAS, the ecological services provided by SIPLAS, and the policies and priority programs outlined in the SIPLAS Management Plan; SIPLAS conservation using an adaptive ecosystem management approach; climate change and SIPLAS' exposure to climate hazards; zoning and land use prescriptions in the management plan; DRRM collaborative management, community-based engagement and sustainable financing.

On the other hand, the initiative will encourage very specific practices like species conservation or biodegradable waste composting. Because of the wide variety of CEPA messages that must be exchanged and the vast number of audiences that must be reached, SIPLAS would include a full-scale communications plan that is based on the management strategy. The various stages of CEPA goals, the expected intervention and behaviour improvement, the different types of CEPA actions that should be performed, and the different contact media that can be used will all be specified in the program.

The key messages in the SIPLAS Communication Plan is shown in Figure 68 for dissemination are on information about SIPLAS terrestrial and marine ecosystems as important ecosystem services provider around Siargao and Bucas Grande Islands specifically to community and tourist. The conceptualization of the logo had based on the KAP result which is the lack of community's determination in conservation and protection of SIPLAS biodiversity.

A series of management meetings for LGU executives and SIPLAS PAMB Sub-Committee on CEPA, for example, may be part of the CEPA initiative. SIPLAS CEPA modules may be incorporated into classroom activities as well as related trainings, conferences, and workshops for various stakeholders. Teachers, student/youth representatives, POs, NGOs, and owners/operators of resorts and other business establishments may all benefit from information campaigns. It is possible to create and disseminate CEPA resources will be

disseminated through various communication channels such as tri-media advertisement, social media advertisement, brochure production, billboards, video and photo coverage, CEPA campaign, social marketing such as SIPLAS Super Squad mascot species, special event related to environment, and SIPLAS week celebrations and among other to strengthen CEPA initiative. In addition, to spearhead CEPA efforts for various stakeholders or target groups, a pool of resource persons/communicators will be organized and tapped NGO in the island such as USAID Biodiversity, Oceans, and Landscapes (SIBOL), SIKAT Inc. and Rare Philippines.

The original implementation of the communications strategy would be handled by the SIPLAS PAMO, in collaboration with the communications departments of the LGUs and the DENR. To help create relevant campaigns, the academe (Department of Education and local colleges), local media in the Siargao Islands and the Province, and other groups may be enlisted.

Individual LGU can launch their own CEPA campaigns focusing on particular LGU issues in addition to the SIPLAS-wide CEPA program. It may, for example, launch a huge public awareness initiative to educate residents about the LGU's susceptibility to climate hazards and what they should do about it. In addition to informing them about the dangers, they would need to be advised about the consequences of these dangers on populations, crops, and livelihood, as well as mitigation measures to mitigate disaster risks. To ensure that communications and the roles that they can play in climate change adaptation and DRRM are recognized, the production and dissemination of CEPA materials will need to be supplemented with barangay assemblies and *pulong-pulong*.

To celebrate the declaration of Siargao Island as SIPLAS, the SIPLAS PAMB initiated the celebration of SIPLAS Week every October of the year. During this event, series of activities will be prepared which will be participated by the major stakeholders of SIPLAS who have a crucial role and functions in managing and conserving its natural resources to wit, the local communities and the nine (9) LGUs representing each municipality. However, efficient execution of CEPA program requires a stable working relationship between the PAMB and the LGUs.

Activities to raise awareness can be expanded beyond SIPLAS' borders in order to stimulate external interest in and support for the long-term development of a fragile, biodiversity-rich island environment endangered by climate change, such as SIPLAS. Provincial LGU decision-makers, regional and national agencies, Mindanao businessmen and business institutions, and numerous donors and donor-funded projects will be among the targets.



Figure 61. The Biodiversity Conservation Campaign Logo of SIPLAS.

Source: SIPLAS Communication Plan 2019-2023

Sustainable Financing

Since the government has provided insufficient funds, SIPLAS PAMB would need to look for alternative sources of funding to execute the management plan. SIPLAS PAMB must raise funds internally to supplement the existing DENR budget allocations to ensure that the natural area is protected, conserved, and rehabilitated beyond the plan time period. Following that, early in the strategy implementation phase, a report would be conducted to assess all possible sources of funds for the protected area.

There are five (5) types of potential revenue generating and sustainable financing schemes that can be identified and implemented in SIPLAS as follows based on DENR-BMB Technical Bulletin No. 2016-08:

- a) Payment for Ecosystem Services (PES) or PES-like schemes for watershed protection;

The Payment for Ecosystem Services (PES) scheme is a voluntary transaction where a well-defined ecosystem service (e.g., a land-use likely to secure that service) is bought by a buyer from a provider. PES works if the buyer(s) values the service more than the cost to providers of maintaining such service.

Other opportunities for PES will also be explored. The PES process will start with the assessment of the ecosystem services being provided by the protected area, and the identification of the uses and beneficiaries of these services. The value of the resource will then be determined and the corresponding fees established. Negotiations for appropriate PES arrangements have to be facilitated by the PASu. All PES schemes will warrant PAMB approval. A LGU ordinance may also be necessary.

b) Estimating appropriate fines for damages;

This scheme imposes charges or fines on human activities in or close to the protected area that have adverse impacts (damages) on the ecosystem and the supply of ecosystem services. The PAMB may impose charges to recover the loss of ecosystem services and/or impose fines to deter activities that cause the adverse impacts.

c) Enterprise development;

Development of social enterprises in protected areas provides for the support that the communities need to harness their potential to find economic stability and not to depend their livelihood to the natural resources found within the protected area.

Self sustaining, biodiversity friendly enterprises of local communities can help ensure the sustainability of SIPLAS. Enterprise development is a relatively new solution in addressing poverty alleviation and environmental conservation at the same time, thus minimizing one of the major threats to biodiversity conservation.

SIPLAS PAMB will pursue and encourage the public and private sectors to employ local residents in the service segment of tourism development. This will provide long-term and sustainable livelihood solution.

d) User fees based on DAO 2016-24;

DENR's Administrative Order 2016-24 provides the principles and guidelines in determining fees for access to and sustainable use of resources in SIPLAS. Fees for access are known as user fees. For protected area entrance fees and facilities user fees, the cost-recovery principle is used. Revenues to be collected should cover, as much as possible, a reasonable proportion of all costs incurred in protecting, maintaining and enhancing the natural attractions of the protected area.

Examples of user fees that can be applied in SIPLAS are the following:

- Entrance fees;
- Fees for snorkelling, diving, mountaineering/trekking, commercial film and still photography;
- Development fee, e.g., telecoms user fee;
- Resource user fees, e.g., water use fee, fishery resource use fee; agrivultural production;
- Facilities user fee, e.g., parking fee

e) Public-private partnerships (PPPs)

The public-private partnership scheme is based on the principle that the public sector can most effectively generate private resources for protected area management by providing incentives to the private sector to meet business objectives. The ultimate goal of this scheme is either increase revenues or facilities savings for protected area management.

There are different avenues for PPPs with the ultimate goal of either increasing revenues or facilitating savings for SIPLAS. Some strategies that maybe explored are the following:

- Optimizing private sector financing

This involves streamlining and restructuring available private sector financing allocated for CSR and environmental activities and programmatically transferring

amounts to the Integrated Protected Area Fund (IPAF). The value proposition for the private sector was that such funds could potentially be more optimally used under a protected area financial plan and leverage together with other resources at the disposal of the PAMB and SIPLAS as a whole.

- Institutionalizing shared responsibilities

This involves unloading the burden of some management activities of protected area management to the private sector where these were logical and cost-effective to the private sector and/or contributed to the company's business objectives.

- Programmatic environmental permitting

This involves establishing an incentive scheme that streamlines multiple environmental permits (e.g., SAPA, environmental compliance permits) for companies with operations in multiple use zones and/or in special zones within SIPLAS. This could result in the identification of one "mother-permit" that the company will pay for which could cover all related permits and facilitate savings for the company. Such savings could then be allocated for activities to support protected area management.

SIPLAS PAMB will explore joint ventures or the use of private and public partnership (PPP) mechanisms for tourism development in the area.

For purposes of generating more funds for conservation activities, the following initiatives may be pursued in SIPLAS:

- ☐ Various on-site protected area stakeholders (SIPLAS PAMO, municipalities, barangays) should clarify their respective roles and responsibilities in relation to specific user fees collected for PA management. Revenue-sharing mechanisms among them will be explored.
- ☐ Establish a transparent and efficient fee collection system.
- ☐ Collect environmental management fees from tourism establishments and tourists who are using natural resources for recreation and enjoying the services provided by LGUs. User fee determination studies may be done to help establish these fees. The plow-back of part of the revenues for the protection and management of natural resources will be integrated into the scheme.
- ☐ With the increase in construction and business development activities due to the tourism boom in SIPLAS, the PAMB shall ensure that the applicable development, resource use, concession, and conservation fees are levied on the entities associated with developments in tourism.
- ☐ Payment for ecosystems services, such as that for the use water, will be explored as a sustainable funding mechanism. The PASu will have to negotiate with water districts and other major water users such as large resorts to provide funding support for the management of water protection areas. The price of the resource can be established through resource valuation studies. Alternatively, the operating Water Districts and other water users can just be assigned to manage parts of or the entire watersheds and water sources using their own financial resources.
- ☐ Solicitation of funds from big companies which have corporate social responsibility (CSR) programs to be used in livelihood or PA management projects.
- ☐ The Integrated Protected Area Fund (IPAF) will be maximized. IPAF systems for the collection, deposit, and avancement, and reconciliation of funds will be reviewed and streamlined. Protected area staff will be given orientation on new protocols that may be adopted.

Climate Change Adaptation measures in SIPLAS

The vulnerability of SIPLAS to climate change is determined by three factors: (a) type and magnitude of Exposure to climate hazards; (b) Sensitivity of the exposed system; and (c) Adaptive Capacity to cope with the hazard. The climate change adaptation strategies and measures described in the earlier sections can be summarized according to the vulnerability element they address, as shown in Table 84.

Table 84. Summary of the climate change adaptation strategies and interventions

To reduce Exposure	To minimize Sensitivity	To increase Adaptive Capacity
<ul style="list-style-type: none"> • Reduce the area of vulnerable areas by zoning and restricting development in high hazard areas • Relocate affected or vulnerable communities • Rehabilitate mangrove forests to provide natural protection to coastal communities; restrict conversion of mangroves • Stabilize slopes to reduce occurrence of landslides • Regulate water extraction; water quality monitoring (for salinity) • Harmonize PA management plans with CLUP; integrate DRR and climate change adaptation to CLUPs • Strengthen disaster management program; disaster readiness 	<ul style="list-style-type: none"> • Diversify crops; introduce/promote hazards-tolerant crops/trees, conservation farming • Protect and manage water production areas for water security • Promote water and soil conservation measures in production systems <p><u>Other possible complementary LGU actions:</u></p> <ul style="list-style-type: none"> • <i>Adopt structural measures to protect shorelines.</i> • <i>Retro –fit existing water ways, channels, etc.</i> • <i>Improve design standards for infrastructure to cope up with climate hazards.</i> 	<ul style="list-style-type: none"> • Enhance biodiversity through effective management and protection of critical habitats • Increase forest areas; intensify enforcement; on-farm production of wood and fuel wood • Effectively manage Marine Protected Areas (MPAs) • Enforce coastal management and fishery laws • Raise awareness of communities of potential hazards and their vulnerability • Capacity building through trainings, seminars, workshops • Provide alternative, sustainable livelihood opportunities to communities. • Ecosystem Based Adaptation (EBA)

Source: SIPLAS PAMO cited from SIPLAS Management Plan CY 2015-2020

Gender and Development

It is stipulated in the PAMB SIPLAS Manual of Operation 2018 that for the conduct of meetings, SIPLAS PAMO as the secretariat shall prepare the registration or attendance of the participants. The attendance sheet would include the (a) name; (b) institution represented; (c) position title; (d) updated contact details; (e) gender; and (f) signature.

Based on Section 11 of DAO 2019-05 or the Implementing Rules and Regulations of RA 11038 known as the Expanded National Integrated Protected Area System Act of 2018 at least forty percent (40%) of the PAMB members shall be women, pursuant to RA 9710 or the 'The Magna Carta of Women'.

Women involvement in SIPLAS PAMO decision makings, activities such as meetings and CEPA, skills trainings and workshops as well as projects such ecotourism management and livelihoods (BDFE and ENGP) are encouraged.

6.2.4 Governance Enhancement and Institutional Strengthening

The new PAMB has one-hundred fifty-two (152) members covering the nine (9) LGUs within SIPLAS. Different sectors and different interests in SIPLAS are well-represented in PAMB. To improve the governance in SIPLAS, an immediate concern is to strengthen the individual and collective capability of the PAMB members to enhance its functionality and establish mechanisms that will allow the PAMB to operate more efficiently.

Knowledge and capability building

SIPLAS PAMB members must have a deep understanding and shared view of the whole protected area, resources, local/national/global importance, potentials, and vulnerabilities. The SIPLAS PAMO has to make sure that all members of the PAMB are provided a full orientation on SIPLAS. The PAMB, as a body, has to go through a continuing capacity and knowledge building activity to enhance its effectiveness in policy formulation, protected area planning and decision-making, resource mobilization and allocation, and coordination and linkages with partner institutions and agencies.

An orientation on new/proposed laws and national policies that are relevant to protected area management, orientation-training on essential weather knowledge for decision-making and orientation/exposure to climate change vulnerabilities are examples of knowledge and capability building activities. Upon SIPLAS PAMB approval, at least one of these forms of events will be planned and conducted each year.

The periodic reporting to the PAMB of the results of implementation of the SIPLAS Management Plan will be another source of knowledge for informed decision-making. The reports will not only present what have been accomplished but should also deepen their understanding and appreciation of how the performance of SIPLAS.

The SIPLAS PAMO, in addition to the SIPLAS PAMB, will be a focus for capability building. As the PAMB's technical secretariat, the PASu and its personnel must be kept up to date on national and international scene, as well as read about different approaches to protected area management. The organizing of SIPLAS data, the synthesis of reports and data processing, and the presentation of information in such a way that it would be useful for PAMB deliberations and decision-making are all skills that should be learned by the SIPLAS PAMO. Exposure to best practices, mentoring, and real work experience or practice are the most effective tools for developing capabilities.

Collaboration and Resource Mobilization

PAMB and other SIPLAS stakeholders may collaborate on a wide variety of protected area management tasks. The following are the most important:

- Protection, rehabilitation and management of nesting sites/wildlife habitat – municipal and barangay LGUs, tenure holders, other agencies and organizations;
- Development of production forestlands – municipal and barangay LGUs, individual farmers, holders of PACBRMA, private sector;
- Protection, rehabilitation and management of mangroves and marine protected areas – DA/BFAR, municipal and barangay LGUs, coastal people's organizations;
- Management of water production areas – municipal and barangay LGUs, water districts and private establishments which have water supply systems;
- Management of eco-tourism sites – municipal and barangay LGUs, people's organizations, Department of Tourism, operators of tourism establishments;
- CEPA and advocacy – municipal and barangay LGUs, other agencies (e.g., DepEd), academic institutions, youth organizations, non-government organizations;
- Livelihood development – municipal and barangay LGUs, other agencies (e.g., DSWD) and organizations, private sector.

Stakeholders such as LGUs, water districts, PACBRMA holders, and Peoples Organizations (POs) may be designated as resource managers for particular management units through agreements with PAMB. As a result, the arrangements should lay out all parties' obligations and accountability, as well as processes and procedures for long-term funding and performance assessment.

To ensure successful on-site management, the PASu and the LGUs would need to agree on a framework for assessing the success of tenure holders and co-managers of SIPLAS on a regular basis. It's important that everybody agrees on the performance metrics to use, the appraisal mechanics, the rewards for good performance, and the penalties for bad performance and non - adherence.

Policy support

The SIPLAS PAMB will have to develop a policy agenda that will help and ensure the long-term sustainability of the protected area management plan's proposed interventions. Any policy issues have arisen during the implementation of the management strategy preparation. The PAMB has chosen to begin with these policy concerns. A strong policy support is a key ingredient to governance enhancement.

- Allow planting of selected non-endemic species in specific areas within the multiple use zone to support fuelwood and timber production initiatives especially if the area has comparative advantage for these products. Allowing it will enhance livelihood support to communities.
- Allow harvesting of planted tree species in multiple use zones to provide incentives to communities to develop and protect degraded areas within these zones.
- Clarify the policy on harvesting non-timber species within the multiple use zone. Some PAMBs do not permit the harvesting of bamboo, rattan, resin and other non-timber products inside protected areas.
- Establish a policy for setting up a scheme on payment for ecosystems services with corresponding fee system for the use of natural resources within SIPLAS. PES will be part of the strategy to develop sustainable financing for protected area operations.
- Clarify possibility of municipal and barangay LGUs getting a share on income from protected area operations (IPAF funds) to encourage it to actively participate in the protection and conservation of protected areas. Barangay LGUs do not get financial benefits from protected areas since all income from PAs go to the IPAF.
- Establish policy for the adoption by the LGU of the zoning in protected areas and its integration into the CLUPs
- Establish marine protected areas by LGUs.
- Adopt harmonized fishery ordinances particularly the registration of fisherfolks, boats and gear, and adoption of close and open seasons.
- Clarify LGU authority to protect and manage marine waters that are beyond the seascape boundaries but still within the 15 km boundary for municipal waters.
- Establish policy allowing land conversion in protected area. Department of Agrarian Reform (DAR) is the responsible agency in land conversion of which required land classification from the LGU to apply for DAR land conversion.

6.3 Management Standards and Guidelines

The protected area's management standards and guidelines are park-wide rules and regulations that must be followed in the area's administration. They may be revised in order to improve the attainment or approximation of goals, objectives, and expected outputs.

6.3.1 Biodiversity Management

The key priority in the management of SIPLAS terrestrial biodiversity is to promulgate and adhere to the NIPAS Act as amended by RA 11038 also known as Expanded NIPAS Act and other relevant government laws on biodiversity conservation. For small island ecosystems like SIPLAS, local extinction is quite high. Poaching of wildlife species for illegal commercial trade is a severe threat to SIPLAS' remaining biodiversity, in addition to the ongoing loss of habitats for plant and animal species. As a result, significant mitigation measures must be implemented, as well as a stringent enforcement of the commercial harvesting restriction in some reserved areas.

Terrestrial biodiversity management

- Introduction of exotic wild fauna is strictly prohibited;
- Restoration projects that are designed to improve a marginal forestland must use indigenous species and must follow uneven-age and random distribution pattern to approximate the succession stage usually occurring in a typical rainforest ecosystem;
- No collection of wildlife is allowed unless results of studies on their population and distribution show the practicability of engaging in the sustainable management and development of the economically important species;
- Scientific studies are allowed following the system of control established by the PAMB and the DENR. At the minimum, trails and patrol roads are to be located and constructed where there would be least damage to soil, biodiversity and where the best scenic areas are located;
- Scientific studies that give priority to identifying the management of indicator species per zone or habitat type will be encouraged;
- Reforestation and watershed management plan shall be formulated, updated and implemented; and
- Section 20 items of DAO 2019-05 will be applied.

Marine, coastal and river biodiversity management

- Major marine habitats (i.e., seagrass beds, mangroves, coral reefs) will be designated as part of the no-take zone. Furthermore, the areas to be covered must be substantial enough, in terms of hectares, to protect the targeted organisms;
- For coral reefs, the currently suggested area must not be lower than 20 hectares of core zone and must be within 10 to 15km from the next protected area;
- A set of three protected areas is the minimum requirement to constitute a network of protected areas. It is encouraged to protect three major habitats together. In effect, the total core zone area will reach a total area of around 60 hectares;
- Development of infrastructures in rivers and coastal areas is allowed provided it is 40 meters from the highest waterline and following DAO 2009-09;

- Commercial fishing is prohibited as all marine areas of the protected area are not municipal waters;
- Collection and selling of tropical aquarium fish and other threatened species are strictly prohibited (per FAO 136); and
- Section 20 items of DAO 2019-05 will be applied.

6.3.2 Recreation

Any recreation activity should maintain the natural beauty of the area. Introduction of any structure should be kept to a minimum and use as much as possible organic and locally-available materials. The design of the structures should follow DAO 2009-09 and conform to the character of the area, e.g. house design should be according to what is practiced in the area and ensure no threatened species will be affected.

- Recreation and/or eco-tourism activities should prioritize the involvement and employment of the local communities;
- Recreation and/or eco-tourism activities may include, where and when appropriate, the following: trekking/hiking and homestay in a local village dwelling/homestay;
- Income from recreation and/or eco-tourism activities should be plowed back to the community that is implementing the recreation and/or eco-tourism activity through a sustainable financing mechanism. Studies on sustainable financing mechanisms in Siargao Islands should be undertaken;
- The preservation of SIPLAS ecosystems must be ensured and that the local community must be involved in the planning and management of eco-tourism development. Community-based planning is an important component, even a prerequisite, of eco-tourism development strategies;
- Public and private partnerships will be promoted to ensure that natural resources are not sacrificed while working on tourism development; and
- Entrance fees, user fees and other fees prescribed in DAO 2016-24 will be collected and deposited in the SIPLAS IPAF.

6.3.3 Site Rehabilitation

Site rehabilitation must be guided by a suitability assessment to ensure appropriateness of interventions.

- All plants to be introduced to the area should, as much as possible, be indigenous to ensure survival and enhance the condition of the area;
- Natural openings must be retained as such. Afforestation is not allowed in natural habitat;
- Enrichment planting in marginal residual forest is allowed only if it is ecologically significant and if the cost is insignificant compared with the rehabilitation needs of other degraded sites;
- Restoration of forest margins is of higher priority than enrichment planting;
- An approved site-specific rehabilitation plan is required prior to actual work implementation; and
- Fishing sites and no-take zones must be segregated.
- Coral rehabilitation (BMB TB 2019-03, Section 4, 5.a, 5.a.3.ii, Section 5.b)/Artificial reefs
- Seagrass restoration
- Mangrove reforestation and rehabilitation

6.3.4 Project Development

Projects and development interventions and new settlements will not be allowed in strict protection zones. Projects and development interventions introduced to multiple use zones will include, as appropriate, the following:

- Sustainable financing mechanisms to ensure the maintenance of recreation and/or ecotourism activities;
- Livelihood opportunities for local communities as alternatives to destructive or extractive activities;
- Environmental Impact Assessment (EIA), especially if the proposed projects will impact on the protected area's resources and are not included in the approved management plan;
- PAMB review and approval, in coordination with the concerned LGUs;
- Appropriate contract or agreement with the PAMB if the existing projects are using their sources of the protected area;
- Complementation with other plans and programs for PA communities;
- Water permit from the NWRB and ECC from DENR, for water development projects;
- Within the allowed land cultivation limits, i.e., not to exceed the allowable five hectares per actual tiller; and
- Any activity that in any manner will mutilate, deface, destroy, excavate, fill-in, vandalize, or damaged any natural formations, habitats, religious, spiritual, historical sites, artifacts and other objects of natural beauty, scenic value or objects of interest to SIPLAS will not be allowed except those that are consistent with the protected area management plan and approved by the PAMB;
- Section 20 item n, o, p, q, r, t, u, and v of DAO 2019-05 will be applied.

6.3.5 Wildlife/Fisheries Management

- The selected indicator species already used for the DENR BMS will be supplemented with indicator species specifically for the marine BMS;
- Featured species that will be used in economic planning will be identified;
- Research on the natural interspersions of various habitat types will be conducted;
- Habitat (structural) diversity in rehabilitation sites will be maximized;
- There shall be designated wildlife viewing areas where wildlife watchers are allowed to stay, following certain rules and regulations;
- Species richness and diversity will be monitored following a standard monitoring scheme; and
- Adopt/apply Section 20 item a, b to e and m of DAO 2019-05.

6.3.6 Road Construction

- Government standards on road construction, environmental impacts and maintenance must be strictly observed;
- Roads to be constructed must be located where there is least or negligible impact or damage to the micro-ecosystem;
- An approved ECC, full blown EIA (within timberland/coastal areas) and road construction and maintenance plan is required prior to project start-up;
- Appropriate road signs must be installed at critical sites along the stretch of the road;

- Off-road viewing areas are to be designated; scenic sites are to be selected following a system of selection;
- Existing regulations pertaining to road construction shall be applied;
- The use of beach sand is not allowed as construction materials;
- Use of black sand and gravel as construction material is allowed;
- No new roads will be constructed in strict protection zones; and
- Reclamation is not allowed per Executive Order 146.

6.3.7 Protected Area Administration

- The PASu, being the chief executive officer of the DENR for the protected area, shall ensure that the PAMB approved management plan for the area is implemented;
- The SIPLAS PAMB shall guide the PASu in implementing protected area wide policies, ensuring that such policies are consistent with national statutes on protected area administration and environmental management and are complementary to local government plans and programs;
- An existing manual of operations which provide the protocols and guides to PA personnel and administrators will be enhanced;
- The PASu as authorized by the PAMB shall issue a permit, authorization or exemption only for culling, scientific research, the exceptions provided under section 27(a) of RA 9147 or harvests of non-protected species in multiple-use zones by tenured migrants;
- All officials and technical personnel employed in the integrated protected area service or all persons deputized by the DENR, upon recommendation of the Management Board shall be considered as field officers and shall have the authority to investigate and search premises and buildings and make arrests in accordance with the rules on criminal procedure for the violation of laws and regulation relating to protected area;
- Protected area infrastructures are to be developed with utmost regard for: (a) security and safety of personnel and visitors; (b) durability of facility; (c) cost of maintenance; (d) cost of construction; and (e) environmental compatibility; and
- The SIPLAS PAMO shall be supported by sufficient number of support staff with permanent plantilla position shall be appointed by the DENR to assist the PASu in the management of SIPLAS.

6.3.8 Livelihood and Economic Development

- Development of the natural resources of the protected area should be subject to the EIA process;
- Harvesting of timber and fuel wood resources for the domestic requirements of communities will be allowed provided that a community woodlot/fuelwood plantation area is established and maintained and that sustainable harvesting is practiced;
- Implementation of the PACBRMA program, and related types, in the multiple use zone is encouraged to define the rights and responsibilities of tenure holders in increasing the productivity of the land;
- The basic principle of “land to the tiller” will be observed in the implementation of the program;
- Agricultural activities that enhance biodiversity and arrest soil erosion are allowed. Use of inorganic chemicals such as pesticides and herbicides and fertilizers is not allowed;
- Section 20 item i of DAO 2019-05 will be adopted;
- Farmers who are currently involved in the use of these destructive products are given ten years to completely eliminate these destructive practices. Use of these chemicals

in all parts of the protected area will be eliminated in coordination with Department of Agriculture;

- A user fees framework will be developed in consultation with the LGUs. This will lay the foundation for allowing facilities and establishments in designated areas of SIPLAS. The computed value will be used in developing cooperative agreements between the PAMB and facility operators;
- The harvesting of non-timber forest products in timberland areas is allowed only after official scientific studies are able to prescribe the specific zones where these will be allowed and the sustained yield level for the products. In the absence of these studies, a temporary volume may be allowed subject to the recommendation of a designated scientific advisor on the matter and provided further that this is approved by the PAMB;
- Harvesting of agricultural products are allowed in designated agricultural and agroforestry areas;
- Harvesting of planted tree species is allowed in multiple use zones subject to existing regulations; and
- All existing facilities or enterprises that benefit directly or indirectly from the protected areas resources will be required to allot a certain percentage share of their revenues for the protection, maintenance and restoration of the protected area.

6.3.9 Communication Education and Public Awareness (CEPA)

- Knowledge, Attitude and Practices (KAP) survey will be conducted as bases in updating SIPLAS communication plan;
- A CEPA Implementation Plan/Communications Plan will be updated for enhancing the management strategies on advocating the importance of the SIPLAS;
- The production and use of CEPA materials will be in English and in the local dialect;
- The CEPA program and materials must enable the communities to actively participate in the management of the SIPLAS in ways that will enhance biodiversity;
- All plans and programs must be disseminated to all barangay settlements, LGUs and other stakeholders for appropriate action;
- Social marketing on SIPLAS Biodiversity such as social media, telecommunications, video promotion and mass media production; and
- Identified important species will serve as Flagship Species which is to be used for Social Marketing.

6.3.10 Waste Management

- A solid and water waste management program shall be developed and approved by the PAMB for implementation in all facilities and communities within SIPLAS;
- The solid waste management program must contain specific designs, processes and options for adoption of participating communities;
- Violators will be charged punitive fees;
- Training on the development of appropriate and cost effective decentralized water treatment facility will be provided to encourage communities to participate in water quality improvement activity;
- Section 20 item f and l of DAO 2019-05 will be applied; and
- Sewage Treatment Plant (STP) will be implemented.

6.3.11 Demarcation of Boundaries

- Permanent markers such as monuments, buoys and alternative markers to the core zones and the protected area boundaries shall be installed using the standard design and specifications as provided in Technical Bulletin 2019-01 which refined the specific guidelines and procedures for the survey and demarcation of boundaries of all legislated protected areas under the NIPAS;
- The demarcation of boundaries shall involve the actual relocation of corners and installation of concrete monuments and other prominent physical landmarks or features of the protected area to ensure its integrity from threats, deter other illegal activities and facilitate enforcement and monitoring;
- For demarcation, the establishment of the boundaries of legislated protected areas using visible markers, monuments, buoys in case of marine areas, and known natural features or landmarks, among others, as a result of the actual ground delineation;
- The monuments and markings such as concrete monuments, buoys or natural markers such as deciduous trees, big rocks/stones and the likes installed and painted to identify the corners of protected areas as described in the legislation;
- Conduct coordination meetings and Communication, Education and Public Awareness (CEPA) involving the concerned municipalities and key stakeholders regarding on the establishment of the delineated boundaries and monuments within the protected area;
- Buoy systems to be used for a particular MPA will be determined by the system considerations and the site location; and
- Special consideration would include proximity to sea lanes or fishing areas. If located on shipping lanes, the buoy hull may have to be reduced in order to keep the buoy clear from possible collision.

VII. SIPLAS HUMAN RESOURCES AND INSTITUTIONAL ARRANGEMENTS

7.1. SIPLAS Current and Propose Management Structure and Institutional Support

7.1.1 Protected Area Management Board (PAMB)

The NIPAS Act, as amended by RA 11038, call for the development of a functional Protected Area Management Board to serve as the protected area's governing body. The PAMB is a multi-sectoral body made up of members from municipal and barangay-level local government units (LGUs), as well as people's associations, non-governmental organizations (NGOs), and government agencies involved in protected area management. As provided for in the ENIPAS Act, the PAMB decides on matters concerning the creation and security of a protected area through issuance of specific policies and regulations. Policy, strategies, proposals, projects, agreements, budget allocation, matters and concerns relating to management plan execution are all decided by the PAMB. The concept of majority voting resolves any opposing decision democratically. The PAMB is required to coordinate the respective interests of its members and to determine equally in order to achieve the purpose of the protected area and to promote the welfare and interests of the various stakeholders, with the primary consideration given. The general management structure in SIPLAS is shown in Figure 69.

The SIPLAS PAMB *En Banc* currently has one-hundred fifty-two (152) members, with twenty (20) members making up the Executive Committee (ExeCom). Furthermore, this Committee is divided into nine (9) sub-committees as shown in Figure 70. PAMB functions based on its current Manual of Operations is guided by rules and regulations of RA 11038 or ENIPAS Act.

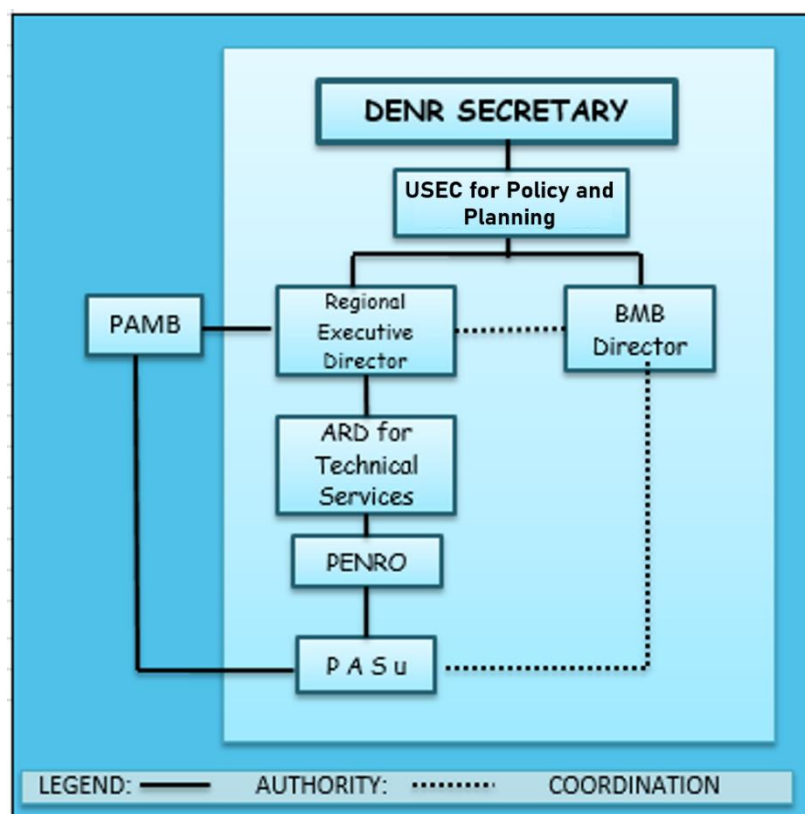


Figure 62. Management Structure in SIPLAS

Source: SIPLAS-PAMP, CY 2015

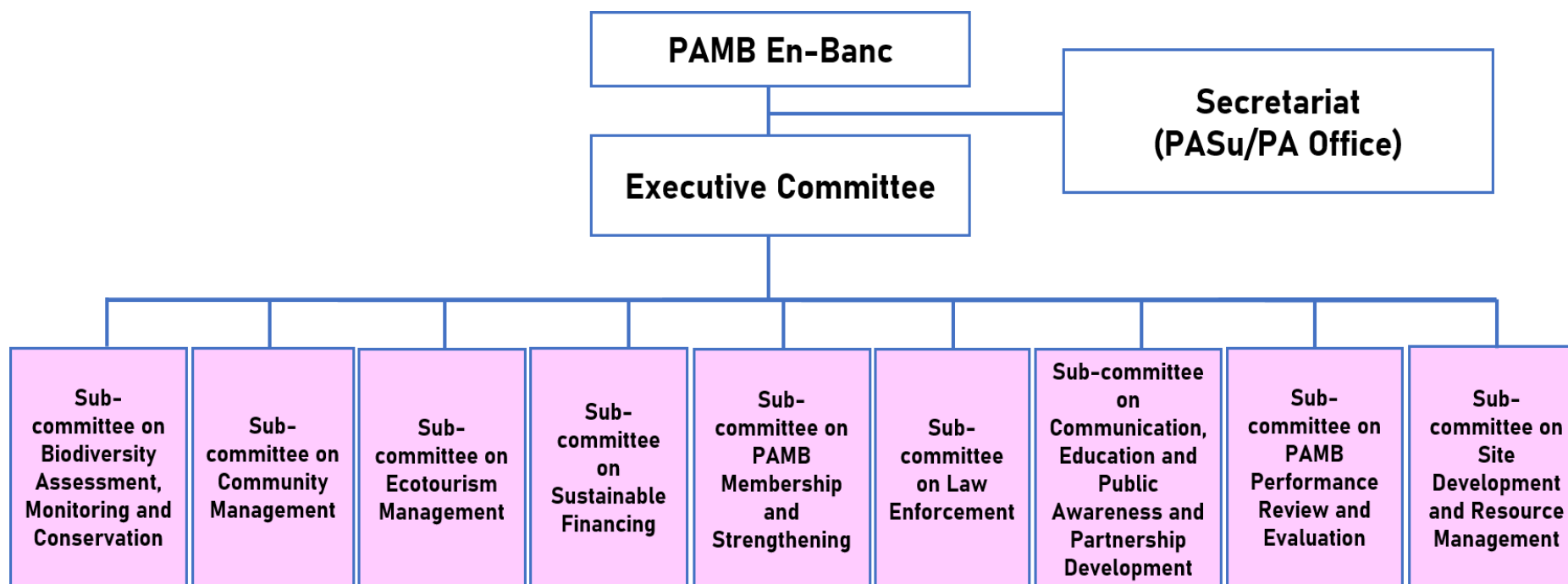


Figure 63. Management Structure for Implementing the SIPLAS Plan

The SIPLAS PAMB is composed of the following members:

Executive Committee: 20 members

- Regional Executive Director, DENR – Region 13
- Provincial Governor, Province of Surigao del Norte
- Congressman, 1st District, Province of Surigao del Norte
- Regional Director, Department of Agriculture (DA) – Region 13
- Regional Director, National Economic Development Authority (NEDA) – Region 13
- Regional Director, Department of Science and Technology (DOST) – Region 13
- Regional Director, Department of National Defence (DND) – Region 13
- Regional Director, Philippine National Police (PNP) – Region 13
- 9 Municipal Mayors/Representatives within SIPLAS
- 1 Academe
- 2 Non-Government Organizations

En Banc: 152 members

- Regional Executive Director, DENR – Region 13
- Provincial Governor, Province of SDN
- Congressman, 1st District, Province of SDN
- Regional Director, DA – Region 13
- Regional Director, NEDA – Region 13
- Regional Director, DOST – Region 13
- Regional Director, DND – Region 13
- Regional Director, PNP – Region 13
- 9 Municipal Mayors/Representatives
- 132 Barangay Captains/Representatives
- 1 Academe
- 2 NGOs

The PAMB has an Executive Committee (ExeCom) to which some of its powers and responsibilities have been assigned. Within the Board, the PAMB has the power to form new committees. The committee will guarantee that PAMB's decisions on these issues are based on an evaluation process that takes into account the impact of the problem or proposed operation. The committees will also keep track of how well the management plan is being implemented in their respective areas. Sub-committee recommendations will be forwarded to the ExeCom or the PAMB *En Banc* for approval and ratification.

Furthermore, the powers and functions of SIPLAS PAMB are presented below:

- Oversee the management of the protected area;
- Approve policies, plans and programs, proposals, agreements, and other related documents for the management of the protected areas;
- Adopt a manual of operations to include rules and procedures in the conduct of business, and the creation of committees and their respective terms of reference;
- Recommend the deputation of appropriate agencies and individuals for the enforcement of laws, rules and regulations governing the management of the protected area;

- Allocate financial resources for the implementation of the management plan and manage the Protected Area Retention Income Account and other funds in accordance with the accounting and budgeting rules and regulations;
- Set fees and charges in accordance with existing guidelines;
- Issue rules and regulations for the resolution of conflicts through appropriate and effective means;
- Recommend appropriate policy changes to the DENR and other government authorities;
- Monitor and assess the performance of the Protected Area Superintendent (PASu) and other protected area personnel and compliance of partners with the terms and conditions of any undertaking, contract and agreement;
- Recommend from among a shortlist of qualified candidates, the designation and appointment of the PASu; and
- Assess the effectiveness of the management of the protected area.

Likewise, Technical Working Committees or Sub-Committees were created as shown in Table 85.

Table 85. SIPLAS PAMB Sub-Committees

Name of Sub-Committee	No. of Members	Status
Sub-committee on Biodiversity Assessment, Monitoring and Conservation Management	5	Operational; Conducts meeting quarterly
Sub-committee on Community Management	5	Operational; Conducts meeting quarterly
Sub-committee on Ecotourism Management	4	Operational; Conducts meeting quarterly
Sub-committee on Sustainable Financing	11	Operational; Conducts meeting quarterly
Sub-committee on PAMB Membership and Strengthening	5	Operational; Conducts meeting semi-annually
Sub-committee on Law Enforcement	5	Operational; Conducts meeting quarterly
Sub-committee on Communication, Education and Public Awareness and Partnership Development	9	Operational; Conducts meeting quarterly
Sub-committee on PAMB Performance Review and Evaluation	7	Operational; Conducts meeting quarterly
Sub-committee on Site Development and Resource Management	6	Operational; Conducts meeting six (6) times a year (usually weeks before the PAMB ExeComm and En Banc Meeting)

Source: SIPLAS PAMO Sub-Committee Reports, CY 2021

The Sub-Committees of the SIPLAS PAMB has the following functions:

1. Sub-Committee on Biodiversity Assessment, Monitoring and Conservation

- Formulate policies and guidelines on the practical and technical aspects of conservation management for plants, animals, ecosystems, habitats and landscapes, including the restoration and rehabilitation of degraded sites and control and eradication of invasive species within the PA;
- Coordinate and monitor continuing research on natural resources, habitat and species that may be undertaken by local and international institutions.
- Recommend policies and measures on appropriate resource uses;
- Facilitate and recommend to the PAMB, resolution of resource use conflicts;
- Review, evaluate and recommend proposals for development like construction of visitor facilities, trails and roads, water system inside the protected area;
- Review, evaluate and make recommendations on measures to rehabilitate degraded and denuded areas inside the protected area;
- Participation in conduct of Biodiversity Monitoring System (BMS);
- Review BMS reports and make recommendations to PAMB, LGUs and concerned stakeholders;
- Coordinate and facilitate the formulation of rules and regulations to protect habitat and species requiring special protection;
- Monitor and report to the community on the enforcement and compliance with agreed upon rules and regulations to protect such species or habitat.

2. Sub-Committee on Community Management

- The main function of this Committee is to formulate policies and guidelines on working with and supporting local communities whose lives and livelihoods interact with the protected area. It focuses on activities that would normally take place within the context of the management plan and conservation objectives of the PA, often in the buffer or multiple-use zones. The Committee will also look broader benefits of the protected area such as disaster risk reduction and climate change mitigation.

3. Sub-Committee on Ecotourism Management

- Review the Ecotourism Management Plan in coordination with the Regional Ecotourism Committee;
- Monitor progress and evaluate implementation of the Ecotourism Plan;
- Coordinate and facilitate the development of marketing strategy for potential donors/investors for the implementation of the said Plan;
- Review, evaluate and recommend proposals for development like construction of visitors' facilities, trails and roads, water system inside protected area;
- Ensure that all facilities for visitors and ecotourism such as trails, and path walks, viewing decks, camping grounds and picnic areas, tree houses and shed houses, and water system, among others, are in accordance with the standard design and specifications prescribed in DAO 2009-09 and other relevant issuances.

4. Sub-Committee on Sustainable Financing

- This committee is tasked to oversee the analysis of financial information and resource planning, and identification and mobilization of resources to implement the SIPLAS Management Plan;
- Review the PA Management Plan, particularly in relation to its Financial Plan;
- Formulate and recommend policy and guidelines for actual and necessary traveling and subsistence expenses and other allowable benefits and incentives;
- Ensure the collection of fees and define guidelines on sharing scheme;
- In coordination with other PAMB Technical Working Committees and other stakeholders, provide support in the mobilization of additional resources to implement the PA Management Plan;
- Coordinate and facilitate the development of marketing strategy for potential donors/investors for the implementation of the Financial Plan; and
- Monitor progress and evaluate implementation of the Annual Work and Financial plan.

5. Sub-Committee on Site Development and Resource Management

- Formulate and recommend policies, guidelines, programs and projects pertaining to resource management such as land use or zoning, protection, restoration, conservation and utilization;
- Recommend standard designs and concepts on physical structures to be established in the area within the parameters set by existing rules and regulations;
- See to it that LGUs/DPWH projects and other government agency projects must be presented and submitted for PAMB clearance;
- Recommend clearance for ECC applications of project proposals/establishments which are compliant to laws, rules and regulations.

6. Sub-Committee on PAMB Membership and Strengthening

- Formulate and recommend specific policy for membership and disciplinary measures for habitual absentees;
- Recommend measures for strengthening of PAMB as a whole such as the conduct of seminar/workshop, dissemination of necessary laws, rules and regulations concerning protected areas;
- Formulate grievance proceeding and recommend findings, if warranted.

7. Sub-Committee on Law Enforcement

- Recommend measures to address threats, issues and concerns related, but not limited to resource use conflicts;
- Monitor and report to the PAMB on the enforcement and compliance with agreed upon rules and regulations to protect species or habitat;
- Review the threats and sources to biodiversity resources of the PA as well as location of exits, entry and routes to the protected area;
- Review policies and regulations on acceptable/allowable activities, including safety protocols on the activities of permitted hunters, gatherers of timber and non-timber forest products, pasture land owners, farmers, traders, officers and staff other government facilities, school children and youth, barangay officials and other residents of the communities inside and around the protected area.

8. Sub-Committee on Communication, Education and Public Awareness and Partnership Development

- Review reports and findings of related studies and research conducted in the protected area as to the goals and objectives, messages and themes; identify target groups; and specify appropriate media for nature interpretation;
- Review plan and design interpretive or information exhibits/signs such as panels, educational and interactive displays, and review the use and application of a wide range of interpretive media/materials/techniques;
- Coordinate and facilitate the selection of key species and habitat, messages and themes, and appropriate media for nature interpretation and the preparation of Nature Interpretation Plan of the protected area;
- Review the nature interpretation kits and packages for distribution to visitors and the general public;
- Review and monitor the implementation of Nature Interpretation Program, including the orientation of visitor and training of tourist guides of the protected area;
- Formulate the Communication, Education, and Public Awareness Program/Plan;
- Coordinate with the media and other organizations in securing support for the implementation of the Communication, Education, and Public Awareness Program/Plan;
- Implementation of Executive Order 02, Campaign on Solid Waste Management including Clean Air Act;
- Coordinate and oversee SIPLAS week celebrations; and
- Oversee promotion of best practices per municipality and including all NGOs.

9. Sub-Committee on PAMB Performance Review and Evaluation

- Call the attention of the responsible office/officer to make sure the implementation of the agreements derived during PAMB Meetings;
- Evaluate the performance of each Technical Working Committee; and
- Recommend further action on matters not acted upon.

The meetings of the SIPLAS PAMB from CY 2015-2021 and the number of resolutions passed are presented in Table 86.

Table 86. SIPLAS PAMB meetings from CY 2015-2021 and No. of Resolutions Passed

Year	No. of PAMB Meetings		No. of Resolutions Passed
	Executive Committee	<i>En Banc</i>	
2015	4	2	43
2016	6	3	70
2017	5	2	86
2018	4	2	81
2019	6	3	277
2020	5	2	154
2021 *as of November	5	2	260
Total	35	16	971
	51		

Source: SIPLAS PAMO, CY 2021

7.1.2 Protected Area Management Office (PAMO)

a. Current SIPLAS PAMO Structure

The SIPLAS PAMO currently has thirty-two (32) staffs and personnel and supported by contractuels and job orders. The PASu, which also acts as the PAMB Secretariat, is in charge of monitoring the protected area's day-to-day operations, including compliance activities. The regular conduct of biodiversity monitoring, habitat assessment, PAMB operations, wildlife species assessment and monitoring, management planning, terrestrial and marine patrolling operations, and processing of land titling and permit are currently the main task being led by the PAMO personnel. Biodiversity study, CEPA, processing and monitoring of issued tenurial instruments, cave and wetland assessment and wildlife population survey is carried out in few barangays. Likewise, intervening activities such as conduct of tree inventory, inspection and investigation of petitions and among others are catered by SIPLAS PAMO.

The Protected Area Management Office (PAMO) – Siargao Island Protected Landscape and Seascape (SIPLAS) is headed by a PASu who acts as the DENR's Chief Operating Officer. The PASu reports to the PAMB and to the PENR Officer directly. The PASu is responsible for carrying out all SIPLAS plans and programs that have been approved by the PAMB.

b. Proposed SIPLAS PAMO Structure

The proposed SIPLAS PAMO structure based on ENIPAS will be composed of five (5) functional units, as shown in Figure 71. The proposed PAMO plantilla position which is the required human resources to effectively managed the protected area is already in the process of deliberation at the Department of Budget Management (DBM) level as provided by the law.

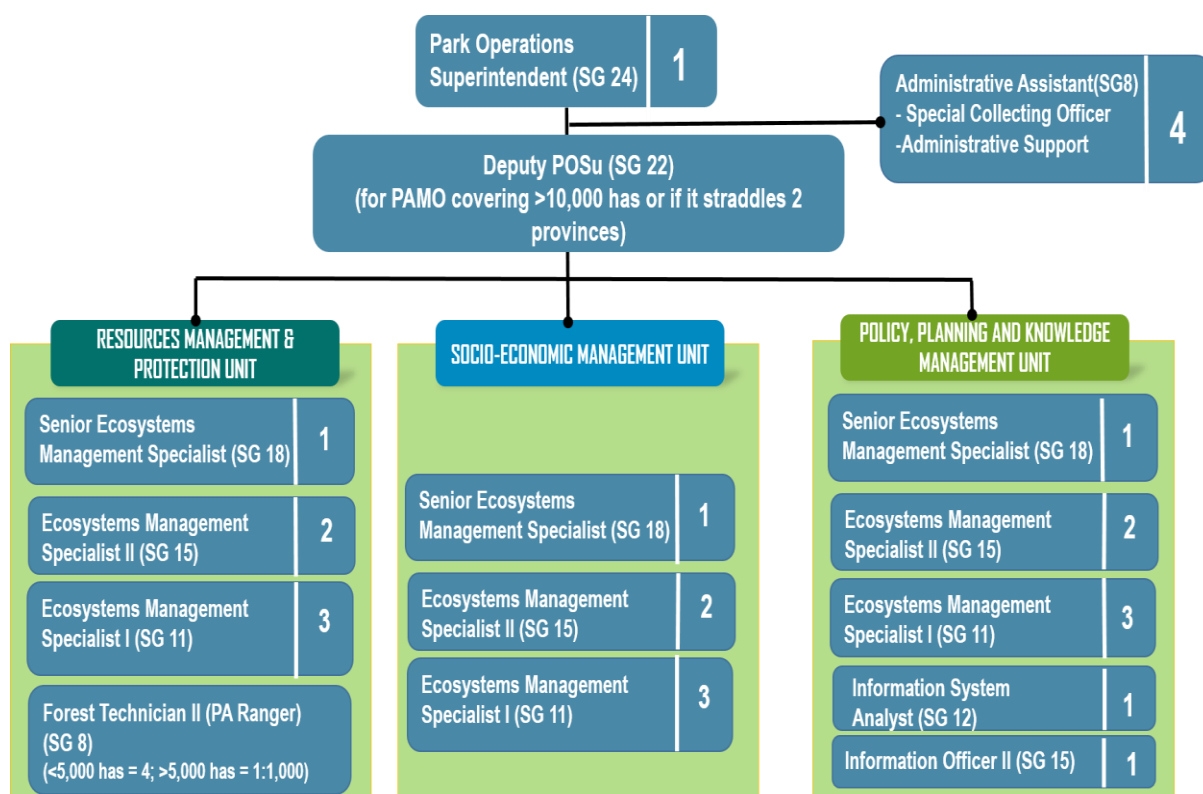


Figure 64. Proposed SIPLAS PAMO Management Structure

➤ Resources Management and Protection Unit

The Resource Management and Protection Unit is composed of one (1) Senior Ecosystem Specialist (SG 18), two (2) Ecosystem Management Specialist II (SG 15), three (3) Ecosystem Management Specialist I and Forest Technical II (SG 8) with ratio to one (1) Forest Technical: 1,000-hectare patrol/assign area. This unit will be in-charged of management zoning implementation, conservation and monitoring, habitat preservation and regeneration, patrolling and biodiversity study coordination, training and CEPA activities aimed at disseminating the SIPLAS management plan's main points. It will also serve as the PAMB's Secretariat and plan the appropriate policies and procedures in the event of a PAMB decision.

➤ Socio-economic Management Unit

This unit will be in-charged of the coordinating community-based resource management activities including providing tenure instruments, creating community resource management plans in each barangay including community organizing. It will also be in charge of ensuring the development and supervision of environmentally friendly and sustainable livelihood options. A Senior Management Specialist, two (2) Ecosystem Management Specialist II and three (3) Ecosystem Management Specialist I will make up the personnel of this unit.

➤ Policy, Planning and Knowledge Management Unit

This unit will focus on formulation and consolidation of SIPLAS wide plans and development initiatives and endorsement to the SIPLAS PAMB for approval. The following are the functions of this unit: preparation of annual work and financial plan, formulation and maintenance of database for efficient and effective development planning, policy formulation and decision making purposes, provide analysis and interpretation on all statistical data including spatial data and coordinations with LGUs.

➤ Administrative and Finance

The SIPLAS PAMO administrative and financial transactions will be handled here. Personnel issues, budgeting, compilation, and accounting will all fall under its scope. The PAMB will appoint a Special Collecting Officer (SCO) to oversee the collection, deposit, and reporting of all revenues obtained and received by the PA. The IPAF PA accounts will be held by the Provincial Environment and Natural Resources Office, which will also provide the required accounting and administrative support for the fund's management.

Each unit would need to be filled with personnel who have been trained in the units' unique responsibilities.

Meanwhile, based on the DENR Administrative Order number 2019-05, the Implementing Rules and Regulations of ENIPAS Law otherwise known as Republic Act 11038, the PASu shall be primarily accountable to the PAMB and the DENR for the management and operations of the protected area. The PASU shall also have the following duties and responsibilities under the Protected Area Management Office (PAMO):

- a. Prepare the management plan, in consultation with the stakeholders, including the annual work and financial plans and ensure its implementation;
- b. Ensure the integration of the protected area management plans, programs, projects, and policies with relevant national and LGUs ' plans and programs;
- c. Provide secretariat services to the PAMB and its committees and ensure the availability of relevant and timely information for decision-making;
- d. Formulate and recommend to the PAMB proposed policies, rules, regulations, and programs;
- e. Establish, operate, and maintain a database management system which shall be an important basis for decision-making;
- f. Enforce the laws, rules and regulations relevant to the protected area, commence and institute administrative and legal actions in collaboration with other government agencies or organizations, and assist in the prosecution of offenses committed in violation of the Act;
- g. Monitor, evaluate, and report the implementation of management activities of the protected area;
- h. Request for and receive any technical assistance, support or advice from any agency or instrumentality of the government as well as academic institutions, NGOs, and the private sector, as may be necessary for the effective management, protection and administration of the protected area;
- i. Issue permits and clearances for activities that implement the management plan and other permitted activities in accordance with terms, conditions, and criteria established by the PAMB: Provided, that all permits for extraction activities, including collection for research purposes, shall also continue to be issued by relevant authorities, subject to prior clearance from the PAMB, through the PASU, in accordance with the specific acts to be covered:
- j. Collect and/or receive pertinent fees, charges, donations, and other income for the protected area: Provided, that such fees, charges, donations, and other income collected/received shall be reported regularly to the PAMB and the DENR in accordance with existing guidelines;
- k. Prepare and recommend to the PAMB approval of the annual work and financial plans of the protected area based on the management plan; and
- l. Perform such other functions as the PAMB and the DENR may assign

The PAMO may also be augmented by the deputized local environment and natural resources officers upon the recommendation of the PAMB and approval of the DENR. According to the DENR AO 2019-05:

a. *Rule II-B.1*

The PASu shall report directly to the CENRO or PENRO who has jurisdiction over the protected area. In cases where the protected area is 'Within the jurisdiction of two or more CENROs, the PASu shall report directly to the PENR Office.

b. *Rule II-B.2*

In case of protected areas located in Philippine waters, including other waters over which the Philippines has sovereignty and jurisdiction, the PASu shall directly report to the DENR Undersecretary for Field Operations through the Director of the Biodiversity Management Bureau.

c. *Rule II-B.3*

In addition to the functions enumerated in Section I I-B, the PASu shall perform the following duties and responsibilities:

- Assume custody of seized items and wildlife, and their by-products or derivatives, the disposition of which shall be subject to a clearance from the PAMB, except for those that: (a) are the subject of custodian **legis**; (b) are the subject of donation; (c) must be deposited with appropriate government agencies; and (d) will be utilized for the DENR's needs, in accordance with the existing rules and regulations;
- Exact and collect administrative fees and fines, for violations of Section 21 of the NIPAS Act, as amended, other related guidelines, rules, and regulations on protected areas and biodiversity **conservation**;
- Issue permits for the use of facilities and amenities, except for those considered as special uses, as defined in the Order;
- Recommend actions for cutting permit for planted trees solely for the traditional and subsistence uses by ICCs/IPs and tenured migrants, of up to five (5) cubic meters per applicant per year. Provided, that, PACBRMA holders with affirmed Community-based Resource Management Plan shall no longer be issued cutting permits. Provided further, that the total volume cut shall not exceed the limits set by the PAMB, and that the location of the cutting is within the appropriate site within the Multiple Use Zone; and
- Process applications for Certificate of Origin and/or transport permits, for natural resources and other products collected/gathered from the protected area, in accordance with the resource use instruments/agreements, or gratuitous permits, issued by the PAMB and/or the DENR, or as the case may be, with the ADSDPP or the CCP of ICCs/IPs.

➤ **LGU participation in Protected Area management**

The presence of LGUs in the PAMB is the key place for involvement in PA management by these local governments. Local governments focus on livelihood and environmental programs, such as Clean and Green projects and resource rehabilitation and restoration. Management of fisheries has been moved to LGUs and therefore forms part of its programs. Given SIPLAS' eco-tourism potential, eco-tourism growth has been included in the Province's and most municipal governments' focus programs.

➤ **Private sector participation in Protected Area management**

In the development of tourism services, the private sector in SIPLAS plays an important role. This business is seeing a rise in private sector investment. In view of this, funding for responsible and sustainable tourism must be supported by the private sector. Tourism investment strategies must adhere to the requirements outlined in the management plan.

➤ **Local Academic participation in Protected Area management**

Networking mechanism such as forging of Memorandum of Agreement (MOA) with the local academic to support the research and development needs of the protected area will be established.

7.2. Policy Support

The SIPLAS policy support was limited to the issuance of PAMB resolutions where urgent issues are presented during the PAMB meetings. The bulk of the "policy proposals" have been reactive, concentrating on permit issuance and organizational issues. The revised management plan gives the PAMB a policy agenda that is related to the plan's initiatives and expenditure directions.

VIII. DEVELOPMENT OF THE LOGICAL FRAMEWORK

The SIPLAS logical framework indicate the list of program and project activities, short term outputs, medium term outcomes, and long term goals for the management of the protected area. The framework will evaluate the programs and projects based on the projected results (outputs/outcomes/impacts).

As discussed in the SIPLAS Management Strategies, Interventions and Activities, the logical framework as shown in Table 87 contains the long term goal, while, Table 88 contains the short goals, as well as the indicators and means of verifications (MOVs) for ecological, social, economic and institutional development in SIPLAS. Table 89 refer to the management focus, and Table 90 refer to the details of the activities to be made within the planning period under each of the management focus.

Table 87. SIPLAS Logical framework – Long Term Goals

LONG TERM GOAL	INDICATORS	MOVS
<p>SIPLAS as a protected and resilient paradise with diverse natural habitat, high biodiversity and endemecity, picturesque landscape and rich coastal and marine resources, inhabited by empowered and people supportive of Protected Area Management capable of sustainable livelihood system including effective ecotourism management and are enjoying adequate social services; managed collectively by environmentally concious stakeholders.</p>	<p>SIPLAS area with high biodiversity are conserved and protected</p>	<p>-No. of maps of the SPZ in SIPLAS -No. of maps of nesting sites, wildlife, and marine sanctuaries being protected -No. of maps of important habitats -No. of approved Habitat Management Plan -No. hectares rehabilitated and maintained with maps -Monitoring and Evaluation Report</p>
	<p>People's Organizations identified as tenured migrants are provided with tenurial instrument and sustained biodiversity friendly enterprise (BDFE)</p>	<p>-No. of approved PACBRMA with maps</p>
	<p>Strengthening of enforcement initiative through SIPLAS Inter-agency Law Enforcement Cooperation (SIALEC)</p>	<p>-MOU signed and notarized -No. of report on coordination meeting -No. of land and seaborne Patrol and Operation Report -No. of apprehended conveyances, equipment, and logistics</p>
	<p>Reduced number of illegal activities in SIPLAS at 80%</p>	<p>Database and statistics of Apprehensions and cases filed from 2021-2030</p>
	<p>Stronger linkages with other institutions: local, national and international, whose activities both terrestrial and coastal and marine ecosystem protection and conservation</p>	<p>Activity Reports, MOA/MOU</p>
	<p>Promote community-based ecotourism in SIPLAS with compliance on guidelines for environment-friendly tourism</p>	<p>- Approved Ecotourism Management Plan (EMP), Memorandum of Agreement (MOA) and Ecological and Socio-economic Impact Monitoring Report</p>
	<p>High awareness and strong participation of the local communities and other sectors on the conservation and protection activities of SIPLAS</p>	<p>-Communication Plan -Knowledge, Attitude, and Practices (KAP) Survey conducted with data analysis</p>
	<p>Fully implemented the solid and waste management plan of the nine LGUs in SIPLAS</p>	<p>-Feasibility study on Sewage Treatment Plant (STP) and cluster sanitary landfill - Monitoring and Evaluation Report</p>

LONG TERM GOAL	INDICATORS	MOVS
	The nine (9) MDRRM Plans are fully implemented with the incorporation of the SIPLAS PAMP management prescriptions	<ul style="list-style-type: none"> -Approved MDRRM plan per LGU -No. of evacuation Center, Protocols, equipment -No. of approved DRR Plan, contingency plan, and develop early warning system device and protocol -No. of procured equipment for quick response
	By 2022, the nine LGUs in SIPLAS has an approved Climate Change Adaptation Plan and R&D for possible restoration measures has started	<ul style="list-style-type: none"> - Formulation of Climate Change Adaptation Plan - Research and development of localized, active habitat restoration interventions using best-available science
	PAMB, protected area staff and LGUs are fully capacitated to implement various programs and activities identified in the updated SIPLAS PAMP.	Plantilla positions, accomplishment reports

Table 88. SIPLAS Logical framework – Short Term Goals and Outcomes

SHORT TERM GOAL	INDICATORS	MOVS	EXTERNAL ASSUMPTION
Sustain the provision of ecosystem goods and services through improved management of terrestrial and coastal and marine resources, particularly of important habitats for biological diversity	Continued monitoring of high conservation value, threatened and endangered species within SIPLAS	-Biodiversity Assessment and Monitoring System (BAMS) report -Biodiversity Monitoring System (BMS) Reports -Geotagged photos, map	Additional technical support through partnership from the Academe, NGOs and other national agencies
	In 2025, the boundary of SIPLAS area will be fully demarcated based on the updated technical description stated in DAO 2019-05	-Report on the Delineation and demarcation of -Map and Geotagged photos	Favorable weather condition for assessment and monitoring; no damages incurred from natural disturbances;
	By 2023, SIPLAS boundaries are demarcated based on updated technical description based on DAO 2019-05	-Geotagged photos, maps and reports -No. of marker bouys installed	Additional technical support through partnership with NAMRIA, PCG, Local communities
	By 2022, research studies conducted within SIPLAS submitted to the PAMB	-Database on researches conducted within SIPLAS -No. of file copies of the research study results	
	By 2022 onwards, one updated and formulated cave, wetland and wildlife management plan within SIPLAS per year	- 50% of the classified caves, wetland and wildlife Management Plan Formulated -PAMB endorsed cave, wetland and wildlife Management Plan -Report on the implementation of cave, wetland and wildlife Management Plan -No. of MOA for the implementation and management of cave, wetland and wildlife	-Cooperation of LGUs, Pos, local communities and other stakeholders - Technical support from the important stakeholders (LGUs, DA, DOST, DILG, RARE, SSCT-DC, STOA, SIKAT, Inc., POs)
	By 2022, SIALEC fully operationalized	-Minutes of the meetings -Activity Report	Full cooperation of the agencies involved
	By 2023, Strengthening of Bantay Gubat and Bantay Dagat through LAWIN and seaborne patrolling and surveillance	-Deputized ENROs and Bantay Dagat -No. of apprehension and confiscation of conveyances, equipment, and logistics -No. of patrols conducted	Technical assistance from other agencies (BFAR, PNP)

SHORT TERM GOAL	INDICATORS	MOVS	EXTERNAL ASSUMPTION
	By 2023, strengthen enforcement through operationalization of forest ranger stations	-Report on manning of ranger stations	Cooperation with the LGUs
	Continued monitoring of existing Mangrove and Beach Forest Development (MBFD) Projects thru LAWIN Patrolling	- Monitoring and Evaluation Report - Geotagged photos and map	Continued cooperation of the PO and local communities on the protection of the rehabilitation sites
	100% of the apprehended violators subjected to criminal case and the seized conveyance and paraphernalia subjected to administrative hearing	- Patrolling of the Protected Area - Engagement of Protected Area monitoring personnel - Apprehension of Illegal Doers - Filing of Cases - Conduct of Administrative Hearing	100% active participation of the members of SIALEC
	At least 20 caves are assessed and classified by 2030	- Cave Assessment report, Geotagged photos, map	
	In 2030, 20 wetlands are assessed and classified with supported of 5 Year Management Plan	- Wetland Assessment report, Geotagged photos, map	
	By 2030, all identified wildlife sanctuary/nesting sites of threatened species within SIPLAS are declared as Wildlife Sanctuary/nesting site	-Geotagged photos, map, and report	
	BY 2025, PAMB-SIPLAS had develop research protocols and database with academic and research institutions for any recent studies undertaken or for any interest to undertake biodiversity studies in SIPLAS	- Research protocols develop and endorsed by the PAMB -MOA signed and notarized	
	By 2030, all watersheds in SIPLAS will have an approved watershed Management Plan	-Watershed management plan updated and PAMB approved	Technical support from LGU, academe and local communities
	By 2025, delineation and demarcation of community watershed areas	-Ordinance declaring the community watershed -Geotagged Photos and map	

SHORT TERM GOAL	INDICATORS	MOVS	EXTERNAL ASSUMPTION
	By 2030, all watersheds in SIPLAS will be fully rehabilitated and restored through updating of maintenance and protection under ENGP	-No. of M&E reports -Geotagged Photos and map	Technical support from other agencies (LGUs, academe)
	Identified the potential source of water for domestic use and irrigation by 2025	-Accomplished inventory template report, map, geotagged-photos -No. of PAMB endorsed water permit application	Technical assistance from the NIA on the identification of the irrigation area
	Strengthen municipal and barangay Fisheries and Aquatic Resources Management Councils (FARMCs) by 2030	-No. of report on monthly, quarterly, annual meetings -No. of registered fishing boats and prescribed fishing gears -Report on fish catch per unit effort	
	Continued rehabilitation of mangrove forest and terrestrial ecosystem	-Accomplished monitoring template report, map, geotagged-photos	
	By 2030, the coral cover of SIPLAS is greater than 22% ; sustained high fish abundance and richness; seagrass beds maintained under fair condition; mangrove maintained under excellent condition and beach forest maintained abundance and diversity	- Seagrass and Mangrove Habitat focus assessment report -Threat focus assessment report -Coral Reef Monitoring Report	Favorable weather condition for assessment and monitoring; no damages incurred from natural disturbances; additional technical assistance through partnership with academe institutions
	By 2030, continued monitoring of existing MPAs and established additional MPAs	-Habitat Assessment Report -Map and Geotagged photos	
	By 2030, the easement areas within SIPLAS are fully recovered	-No. of NOV letters delivered and received by the violators -Report on the demolition of the infrastructures within the easement area with map	
	Managed foreshore areas by 2023	-Memorandum of Agreement (MOA) and map	

SHORT TERM GOAL	INDICATORS	MOVS	EXTERNAL ASSUMPTION
Increase resiliency of SIPLAS ecosystems and its stakeholders, primarily the communities, to threats of disaster and climate change	By 2024, mapping of vulnerable and disaster-prone areas around SIPLAS reviewed and updated	Report and recommendations submitted	Favorable weather condition for assessment and monitoring; no damages incurred from natural disturbances;
	By 2025, installation and enhancement of disaster alarm device (detector of earthquake, landslide, tsunami, water level ruler) in every municipality	-M&E report -Geotagged photos and map	-Technical support from the DRRM
	By 2030, protected area stakeholders are fully capacitated related on disaster risk and reduction management	-Proceeding Reports on the capability building trainings	-Technical support from the DRRM
	By 2025, conducted habitat assessment including physiological factors in areas prone to disaster.	-Habitat assessment report Geotagged photos and map	
	Community preparedness to climate change and disaster impacts by 2022	-DRR plans, hazard maps (landslide-prone, flood-prone, etc), installed warning signs	
	By 2027, infrastructures established in SIPLAS are followed on the Ecosystem-Based Adaptation for the Impact of Climate Change	- Blueprint Design of the infrastructures - Database on the list of inventory of the infrastructures with map	
	Threats identified in SIPLAS are effectively addressed and responded by 2022	-Response Plan formulated -Reforestration Plan formulated -Enforcement Plan formulated	
	Developed and managed community-based ecotourism by 2023	-Site specific ecotourism management plan and Memorandum of agreement (MOA) in managing the ecotourism site	
	Assessed and studied carrying capacity for all ecotourism sites and SIPLAS itself by 2023	-Carrying Capacity Assessment Report with analysis	

SHORT TERM GOAL	INDICATORS	MOVS	EXTERNAL ASSUMPTION
To promote equity among local communities through sustainable livelihoods including community based ecotourism, social services and broader benefit-sharing mechanisms	By 2022, protected area occupants in SIPLAS are identified	-SRPAO (i.e. Survey and Registration of Protected Area Occupants) Report with the list of protected area occupants	
	By 2023, continued yearly monitoring on SRPAO Database	-Database on the list of tenured migrants in SIPLAS	
	PACBRMA issued and monitored by 2021 onwards	-PACBRMA M&E report -Geotagged photos -Copy of PACBRM agreement	
	Identified fuelwood plantation and woodlots development sites in SIPLAS are fully established	-Map, geotagged-photos -Tenurial instrument issued (MOA/PACBRMA/CMA) -Report on the maintenance and protection of fuelwood plantation	
	Continued monitoring on existing BDFE Formulation and implementation of BDFE	-Approved BDFE project -Accomplished monitoring template report, map, geotagged-photos	-Active participation and cooperation of POs
	By 2030, ten (10) registered PO's in SIPLAS are fully operated on their BDFEs	- MOA signed and notarized -Report on the BDFE implementation - Financial management	
	Fully operated and implemented community-based ecotourism as BDFE	-Impact monitoring report on ecological and socio-economic condition (income) -Approved MOA for to the identified recipients -Report on the implementation of BDFE and other livelihood activities	
	Agreement between PAMB and tourism operators and ecotourism site managers on biodiversity conservation and responsible tourism	-MOA signed and notarized	
	Sustainable agro-tourism livelihood value chain activities are implemented in order to increase income among the SIPLAS occupants	-PACBRMA CRMP M&E report -MEA METT Results -Geotagged photos	-Active participation and cooperation of Pos

SHORT TERM GOAL	INDICATORS	MOVS	EXTERNAL ASSUMPTION
To strengthen stakeholder participation in the management of SIPLAS through community empowerment and increased investments of LGUs and the private sector in natural resource management and conservation.	By 2021 onwards, regular PAMB meetings conducted	-No. of PAMB meetings conducted (ExeCom, EnBanc, and Sub-Committee) -Minutes of the meetings and resolutions passed and approved	Technical support from the important stakeholders (LGUs, DA, DOST, DILG, RARE, SSCT-DC, STOA, SIKAT, Inc., POs)
	The nine (9) SIPLAS PAMB Sub-Committees are fully operated	-PAMB Manual of Operation -Sub-Committee Minutes of the Meeting	
	By 2023, the LGU and other partners are fully mobilized in the PA-wide CEPA campaign	-Updated Communication Plan -MOU signed and notarized	
	Communication, Education and Public Awareness (CEPA) conducted	-CEPA Materials Produced -CEPA campaigns, environmental celebrations conducted -SIPLAS Week Celebrations conducted -SIPLAS Super Squad Flagship Species for social marketing implemented	
	Agreement between PAMB and Telecommunication companies on dissemination of information about SIPLAS	- MOA between PAMB and telecommunication companies on the dissemination of information about SIPLAS -Financial support in production of the CEPA materials (video promotions)	
	By 2025, DepEd Siargao Division had incorporated the SIPLAS profile in their lessons plan and activities.	-MOU signed and notarized -No. of modules produced	
	MOA signed between PAMB-SIPLAS and tertiary schools with regards on mandatory tree planting of their graduates by 2023	- MOA signed and notarized	
	In 2030, 9 PACBRMA Holders in SIPLAS had fully implemented their CRMPs	-Approved CRMP endorsed by the PAMB -Approved Updated CRMP endorsed by the PAMB -Monitoring Report	
	In 2023, SIPLAS MPAN is fully operated.	-SIPLAS MPAN endorsed by the PAMB -MOU signed and notarized	

SHORT TERM GOAL	INDICATORS	MOVS	EXTERNAL ASSUMPTION
	Fully operated inter-LGU Fisheries Enforcement	-MOU signed and notarized -Database of the registered boats, gears per municipality -Report on the Wildlife Trafficking and Monitoring	
	SAPAs/MOAs with the private investors endorsed and approved by the PAMB	-Database of the SAPA/MOA	
	Waste management implemented	-Solid waste management monitoring report -Solid waste support facilities such as Material Recovery Facility (MRF) and Residual Containment Area (RCA)	
	By 2025, stakeholders agreed in the implementation of the wastewater management	-MOA signed and notarized	
	By 2023, the IPAF collection thru entrance fee in SIPLAS are fully operated	- IPAF Report	
	Identified potential activities for Payment for Ecosystem Services (PES)/Ecosystem resource valuation	-Report on the inventory to the potential activities for Payment for Ecosystem Services (PES) -Report on resource valuation -Collection report on users fees based on the Value of the Ecosystem Services of the important habitats within SIPLAS	
	By 2022 onwards, the management and utilization of SIPLAS IPAF Collection are fully established	-Approved WFP of the IPAF RIA endorsed by the PAMB -Report on the WFP for IPAF, presentation of the WFP to the SIPLAS-PAMB	-Cooperation of the LGUs and PLGU on the implementation of the IPAF Entrance Fee Collection
	Institutionalized SIPLAS PAMO	-PAMO support facilities -Organizational chart -Accomplishment reports	

Table 89. SIPLAS Management Focus

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
A. Terrestrial Management				
a) Demarcation of management zones	1	Consultation meetings conducted	-No. of Consultation Meeting report with Attendance and Photodocumentations	
	2	Management zones (SPZ and Water Conservation Areas) demarcated	-Installed markers -CSW/Report with recommendations and photodocumentation and maps with technical descriptions	
	3	Maps distributed in the LGU and Barangays	Report on the Demarcation with Approved Map and the following: -Copy of update SIPLAS maps -Photodocumentation	
b) Biodiversity research and documentation (develop research framework and protocols,execute agreements, conduct research, develop database)	1	Established of database on the research studies conducted in SIPLAS	-Database	
	2	Formulated research framework and protocols for research studies to be conducted in SIPLAS	-Research frameworks and protocols formulated and PAMB endorsed	
	3	PAMB resolutions endorsed the project proposal for Issuance of gratuitous permit	-No. of PAMB resolutions	
	4	Monitored and established terresrtial BAMS Sites	- BAMS Assessment Report with maps	
	5	No. of total area for enhancement of arboretum	Report/Plan in enhancement of arboretum which includes the following: 1.Name of species to be planted 2. Photo documentation 3. Area development plan	
c) Habitat restoration and rehabilitation	1	No. of assessment/survey conducted	Report on the conducted assessment/survey	
	2	No. of hectares rehabilitated/restored	Report on the conducted rehabilitation and restoration with photo documentations	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
	3	No of NGP plantation maintained and enhanced	Report on maintenance and enhancement of NGP plantation with photo documentation	
	4	List of existing seedling productions managed by People's Organization (PO)	Report on the list of existing seedling productions managed by PO including the no. of existing seedlings, name of the species produce	
	5	No of coordination meeting conducted for nursery establishment of indigenous species per LGU	Report on the coordination meeting with LGU and DA	
	6	No. of communication letters received from the academe with regards to the tree planting activity of their graduates	Report on the coordination meeting conducted by the academe to the PAMO-SIPLAS	
	7	No. of trees planted	Report from the academe in the conduct of the tree planting activity including the location, total area and total of the trees planted of their graduates	
d) Cave Conservation and Management	1	No. of caves inventoried in SIPLAS	Report on the updated cave inventory in SIPLAS	
	2	No. of cave assessed/classified	Report on the assessment and classification conducted	
	3	No. of cave planning workshop/writeshop conducted	Report on the workshop/writeshop conducted	
	4	No. of formulated cave management plan	Cave management plan endorsed by the PAMB	
	5	No. of updated cave management plan	Report in the conduct of updating of cave management plan	
	6	No. of M&E conducted	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	
	7	No. of Group Insurance for Cave Management Focal Persons	Group insurance acquired	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
e) Wetland Conservation and Management	1	No. of wetlands inventoried in SIPLAS	Report on the updated wetland inventory in SIPLAS with map	
	2	No. of wetland assessed and classified	Report on the wetland assessment and classification with maps	
	3	No. of wetland planning workshop/writeshop conducted	Report on the workshop/writeshop conducted	
	4	No. of formulated wetland management plan	Wetland management plan endorsed by the PAMB	
	5	No. of updated wetland management plan	Updated Wetland Management Plan endorsed by the PAMB	
	6	No. of M&E conducted	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	
f) Wildlife Conservation and Management	1	No. of inventoried nesting sites	Report on the inventory of sighting areas	
	2	No. of assessed habitat/nesting site	Report on the conduct of assessment	
	3	No. of hectares established as Wildlife Sanctuary/ nesting sites	Report on the habitat assessment, survey conducted in the nesting sites	
	4	No. of surveillance and patrolling conducted	Report on the conduct of patrolling and surveillance with findings and recommendations from patrollers with the following attachments: Copy of the Approved Regional Special Order for the Creation of the patrolling/surveillance team.	
	5	No. of team organized for surveillance		
	6	No. of CEPA conducted	Report on the CEPA conducted in LGUs/Barangays	
	7	No. of conducted M & E	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	
	8	No. of permit holders (Wildlife Registration and Wildlife Farm Permit) monitored	List of permit holders (Wildlife Registration and Wildlife Farm Permit)	
	9	No. of Wildlife Traffic Monitoring Units operationalized and mobilized	Report on the monthly Operation and Mobilization of Wildlife Traffic Monitoring	
	10	No. of mobilized WEO	Submission of WEO monthly and quarterly report including biodiversity related cases acted	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
g) Biodiversity Monitoring System (BMS) in four (4) terrestrial sites	1	No. of BMS sites monitored	-BMS Report including the identified threats submitted and presented to PAMB -PAMB Resolution endorsing the BMS report with recommendation -Actions taken in support to the recommendation given by the PAMB	
h) Biodiversity Assessment and Monitoring Site (BAMS) Terrestrial	1	No. of BAMS site monitored established	-BAMS site monitored and established -BAMS report -PAMB Resolution endorsing BAMS report	
i) Community-based resource protection	1	No. of hectares demarcated as forest lands	CSW/Report with recommendations and photodocumentation and maps with technical descriptions	
	2	No. of applicants endorsed for DENRO	Report on the findings during the conduct of deliberation for DENRO/ no. of DENROs deputized	
	3	No. of trainings conducted on Forest Protection and Rehabilitation	Report on the trainings conducted on Forest Protection and Rehabilitation	
	4	No. of trainings/workshops conducted on protected area communities especially on PACBRMA holders	Report on the trainings conducted on PA communities especially on PACBRMA holders	
	5	No. of conducted M & E	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	
j) Conservation of water production areas	1	No. of identified and assessed water production areas	Report on the conduct of identified and assessed water production areas with maps and technical descriptions	
	2	No. of hectares demarcated as water source	CSW/Report with recommendations and photodocumentation and maps with technical descriptions	
	3	No. of Memorandum of Agreement signed between PAMB and list of names of the identified resource managers	Report on number of Memorandum of Agreement and list of identified resource managers	
	4	No. of permits applied in NWRB	Database on the list of applicants applied in the NWRB	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
k) Strengthening of Enforcement (Patrolling and Surveillance)	5	No. of formulated/updated watershed management plan	Report on the conduct of watershed management plan	
	6	No. of hectares managed and rehabilitated	Report on the conduct of rehabilitation and management	
	1	No. of Bantay Gubat hired	Approved work and financial plan (WFP)	
	2	No. of trainings for Bantay-Gubat conducted	Report on the conduct of Bantay-Gubat trainings	
	3	Honorarium/moneratry incentives of deputized Bantay Gubats appropriated/allocated	PAMB Resolution on the approved WFP for the honorarium/monetary incentives of deputized Bantay Gubats	
	4	No. of teams organized	Report on the conduct of regular patrolling and surveillance with documentation and reporting of violations and following report attachments: - Copy of the Approved Regional Special Order for the Creation of the patrolling/surveillance team.	
	5	No. of Regular patrol and surveillance conducted		
	6	No. of apprehended undocumented forest products including NTFPs, vehicles, equipment and other implements thru proper channel	Report on apprehension of the undocumented forest products including NTFPs, vehicles, equipment and other implements	
	7	No. of bd.ft of hauled apprehended forest products and vehicles	Hauled apprehended forest products and vehicles	
	8	No. of administrative and adjudication proceedings for apprehended forest products including conveyances, tools and implements	Proceedings for apprehended forest products including conveyances, tools and implements were documented	
	9	No. of inventoried apprehended/confiscated forest products	Report on the documented inventory of apprehended/confiscated forest products	
	10	No. of filed complaints	-Report on the investigation -Affidavit on the filing and prosecution of criminal complaints	
	11	SIALEC Operationalized	Report on SIALEC Operationalization	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
	12	No. of checkpoints maintained	Report on the maintenance of existing checkpoints/guard house	
	13	No. of logistics provided for field offices and AILTF checkpoints	Procured gadget and other telecommunication devices given to the AILTF field personnel *Logistics for internet (load cards) procured and given to the AILTF field personnel	
	14	No. of guard house constructed	Report on the newly constructed guard house	
	15	No. of CEPA conducted	Report on the conduct CEPA to the identified barangays quarterly	
2. Socio-Economic Development				
a. Provision of land tenure security	1	SRPAO (Survey and Registration of Protected Area Occupants) updated	-Database on SRPAO members - Activity report on the conduct of SRPAO interviews - Report on updating the list of SRPAO members	
	2	No. of eligible claimants trained/organized	Report on the conduct of seminar/workshop in the eligible claimants to become People's Organization	
	3	No. of inventoried land claims and development in forestland in MUZ	Report on the conduct of inventory of land claims and development in forestland with maps and technical description	
	4	No. of processed tenurial instrument (i.e PACBRMA/SAPA,MOA)	Database on the list of tenurial instrument	
	5	No. of formulated tenurial management plan	Report on the conduct of tenurial management plan	
	6	No. of M&E conducted	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
b) Agroforestry farm development	1	No. of Identified and assessed current and potential sources of water for domestic use and irrigation	Report on the identified and assessed of current and potential sources of water for domestic use and irrigation	
	2	No. of delineated areas for agroforestry	Report on the conduct of delination of agroforestry with maps and technical description	
	3	No. of trainings conducted on SWC and farm planning	Progress Report on the conduct of SWC and farm planning	
	4	No. of farm development plan and maintenance formulated	Report on the conduct of farm development plan and maintenance formulated with maps and technical description	
	5	No. of planting materials procured	List of planting materials to be procured	
	6	No. of soil sampling and analysis conducted	Report on the conduct of soil sampling and analysis	
	7	No. of areas on Sloping Agricultural Land Technology (SALT) implemented	Report on the implementation of Sloping Agricultural Land Technology (SALT)	
d) Fuelwood plantation and woodlots development	1	No. of hectares validated for fuelwood areas	Report on the conduct of validation with maps and technical descriptions	
	2	No. of farmers beneficiaries	Database of the farmer beneficiaries	
	3	No. of farm plans formulated	Report on the conduct of farm planning with findings/recommendations	
	4	No. of plantations established	Report on the findings of established plantations with maps and technical descriptions	
	5	No. of issuance of permits, PAMB Resolutions and tenurial instrument	Database of issuance of permits, PAMB Resolutions and tenurial instruments	
	6	No. of hectares for silvicultural practices employed	Report on the employment of silvicultural practices	
	7	No. of hectares for selective cutting	Report on the consultation meeting with LGU for identification of selective cuttings per municipality	
	8	No. of M&E conducted	Monitoring Report of Fuelwood Plantation and woodlots development	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
e) Development and Implementation of Biodiversity Friendly Enterprise and other livelihood activities	1	No. of feasibility assessment conducted	Report on the conduct of feasibility assessment with findings	
	2	No. of updated list of PO in SIPLAS	Report on the updated list of PO in SIPLAS	
	3	No. of trainings conducted	Report on the conducted trainings	
	4	No. of bussiness plan prepared	Report on the conduct of bussiness planning with the following attachments: -Copy of the bussiness proposals	
	5	No. of BDFE and other livelihood activities implemented	Report on the implementation of BDFE and other livelihood activities	
B. Coastal and Marine Resources Management				
1. Delineation of SIPLAS Boundary and Management Zone based on the DAO 2019-05 updated Technical Description	1	No. of kilometers delineated SIPLAS Management Zone	Report on SIPLAS Management Zone delineation Map	
2. Coastal habitat and species conservation				
a) Identification of wildlife nesting sites and demarcation of its management zones (SPZ)	1	No. of inventoried identified nesting sites	Inventory report on the identified nesting sites	
	2	No. of areas demarcated	Report on the Delineation and demarcation of identified nesting sites with maps and technical descriptions - Database on the ordinances	
	3	No. of ordinances passed		
	4	No. of consultation meetings conducted	Report on the conduct of consultation meetings	
	5	No. of BAMS site established in marine	Full Site Assessment Report on the selected BAMS Site	
	6	No. of monitoring and evaluation conducted	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
b) Management of MPAs	1	No. of hectares areas for MPAs validated	Report on the validation conducted	
	2	No. of participatory workshops on MPA management plan conducted	Report on the conducted management planning workshop	
	3	No. of Coastal and Marine Habitat Assessment conducted	-Report on the marine habitat assessment and monitoring -MPA Patrolling Report	
	4	No. of bouys distributed by SIPLAS PAMO	Report on the distributed bouys with the following attachments: -Notice of Awards -Deed of Donations	
	5	MPA Network Action Agreement and Plan reviewed/updated	-Approved MPA Network Action Plan endorsed by the PAMB -MOA signed by the stakeholders regarding on the implementation of the MPAN	
	6	No. of MPA Network Forum and MPA effectiveness assessment conducted	Report on the conduct of forum and assessment	
	7	No. of joints activities conducted	Report on the conduct of joints activities	
	8	No. of hired MPA managers	Report on the accomplishment of the MPA	
	9	No. of MPA management plan monitored and evaluated	Report on the accomplishment of the MPAs	
c) Seagrass Monitoring	1	Seagrass assessment and monitoring conducted	Report on the conduct of seagrass monitoring with map	
d) Coral rehabilitation	1	No. of hectares identified suitable for coral rehabilitation	Report on the conduct of identification of suitable sites for coral rehabilitation	
	2	No. of consultation meetings conducted with Coral Rehab experts	Report on the conduct of consultation meetings with Coral rehab experts	
	3	No. of areas rehabilitated and maintained	Report on the conduct of rehabilitation and maintenance	
	4	No. of trainings conducted		

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
	5	No. of ARs installed	Report on the conduct of ARs installation	
	6	No. of hecatres of new installed ARs	Database of ARs status, location and maps	
	7	Fish Visual Census (FVC) conducted	Report on the conduct of coral reef monitoring and Fish Visual census (FVC)	
e) Mangrove protection and rehabilitation	1	No. of hectares of abandoned unlicensed fish ponds reforested and enhanced	Report on the conduct of identification of suitable sites for mangrove enhancement with map	
	2	No. of hectares rehabilitated and maintained	Report on the conduct of rehabilitation and maintenance	
	3	No. of nurseries established for seedling and propagule production	Report on the established and maintained nurseries	
	4	No. of hectares adopted for the implementation of Adopt NGP Programs	Report on the implementation of adopt NGP Programs with maps and technical descriptions	
	5	No. of hectares of assessed/monitored mangrove area	Report on the monitoring of mangrove area	
	6	No. of tree planting activities conducted	Report on the conduct of tree planting activities	
	7	No. of PO active in maintaining mangrove rehabilitation and maintenance	Report on the conduct of mangrove rehabilitation and maintenance	
	8	No. of area assessed for water quality	Report on the Water Quality Monitoring to the TREs	
	9	No. of seaborne patrol conducted	Report on the conduct of seaborne patrol	
	10	No. of provided technical assistance to LGUs on coastal and marine related concerns	Report on the conduct of Technical Assistance to LGU's	
	11	No. of water resource plan crafted	Water resource disaster response plan	
	12	Water resource disaster response plan (monitoring) implemented	Report on the conduct of public consultation and meetings in the development of response plan	
	13	No. of signage installed		

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
	14	No. of CEPA conducted	Report on the conduct of CEPA and installation of signage	
f) Biodiversity Monitoring System (BMS) in four (4) marine sites	1	Biodiversity Monitoring System in marine conducted	BMS Report including the identified threats	
3. Fisheries management	1	No. of meetings conducted	Report on the institutionalization of SIALEC	
	2	No. of approved/passed resolutions		
	3	No. of apprehensions conducted		
	4	No. of signed inter-LGU Fisheries Enforcement MOA	MOA signed by the partner stakeholders	
	5	No. of municipal and barangay FARMCs reactivated	-List of FARMCs identified by the LGUs -Municipal Resolutions and PAMB Resolutions endorsing the FARMCs	
	6	No. of trainings, capacity building conducted reactivated and strengthen	Report on the conduct of trainings	
	7	No. of team organized	Report on the conduct in creating and training for bantay dagat	
	8	No. of trainings conducted		
	9	No. of approved ordinances	Database for approved ordinances	
	10	No. of Wildlife Trafficking and Monitoring (WTM)	Report on the Wildlife Trafficking and Monitoring	
	11	No. of registered fishing boats and gears	Report on the conduct of registration of fishing boats,gears per municipality	
	12	No. of inventoried unlicensed fish cages	Inventory report on the List of unlicensed fish cages	
	13	No. of LGUs provided with technical assistance	Report on technical assistance to the LGUs (Assessments, monitoring, trainings and workshops)	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
4. Foreshore Management	1	No. of inventoried existing use and development in the foreshore area	Report and database on the conduct of inventory of existing use and development with maps and technical description	
	2	No. of processed application for appropriate tenurial instruments	Report and database of the application	
	3	No. of monitoring and evaluation conducted	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	
5. Easement Management	1	No. of inventoried existing facilities and other development facilities within easement	Report on the conduct of inventory of existing facilities and other development facilities	
	2	No. of hectares of demarcated easement	Report on the conduct of demarcation and recovery of easement	
	3	No. of teams organized		
	4	No. in hectared of recovered easement		
	5	No. of issuance of notice of violation		
	6	No. of monitoring and evaluation conducted	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	
6. Development and Implementation of Biodiversity Friendly Enterprise and other livelihood activities	1	No. of feasibility assessment conducted	Report on the conduct feasibility assessment with findings	
	2	No. of updated list of PO in SIPLAS	Report on the updated list of PO in SIPLAS	
	3	No. of trainings conducted	Report on the conduct of trainings	
	4	No. of bussiness plan prepared	Report on the conduct of bussiness planning with the following attachments: -Copy of the bussiness proposals	
	5	No. of implemented BDFE and other livelihood activities	Report on the implementation of BDFE and other livelihood activities	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
C. Cross Cutting Management				
1. Eco-tourism development	1	No. of areas listed as eco-tourism sites/destinations	Report/Database on list of updated eco-tourism sites	
	2	No. of reviewed/updated SIPLAS Site specific ecotourism Management Plan	Updated the 5 Year SIPLAS Site specific EMP	
	3	No. of formulated site specific management plans	PAMB approved EMPs	
	4	No. of workshop/writeshop conducted	Proceedings on the trainings/workshops/writeshops conducted	
	5	No. of conducted monitoring and evaluation on review of current operations, physical development plan and marketing plans for current tourism sites; refinement of plans	Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	
	6	No. of approved MOA between tourism operators and ecotourism site managers on biodiversity conservation and responsible tourism	Approved MOA signed notarized	
	7	No. of coordination meeting conducted with DOT and other tourism organization for responsible tourism	Report on the conduct of with DOT and other tourism organization for responsible tourism	
	8	No. of application for SAPA related to ecotourism development	Report/Database on the SAPA application	
	9	No. of ecological impacts studies	Comprehensive Report on the conduct of ecological impact studies	
	10	Reviewed gamefishing regulations for sustainable fisheries	PAMB Resolutions Imposed regulations for game fishing activities	
	11	No. of CarCap studies conducted	Report on conducted CarCap studies with findings, approved resolution from the PAMB before the conduct of the CarCap Studies, presentation of the result to the PAMB	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
	12	SIPLAS wide CarCap study conducted	Carrying capacity study report	
	13	Implemented regulations on responsible anchoring practices of pumpboats	PAMB Resolution imposing the regulations on responsible anchoring practices of pumpboats	
	14	Reviewed Provincial Tourism Master Plan that will anchor in the SIPLAS Management Plan	Findings report on the Provincial Tourism Master Plan with recommendations	
2. Waste management	1	No. of existing RCA Facility	Report on the conduct of inspection and exsisting RCA Facility	
	2	No. of inspection conducted on RCA Facility		
	3	No. of trainings on cluster SWM facilities and appropriate WWM facilities for major point sources	SWM facilities and appropriate WWM facilities constructed to the major point source	
	4	Open dumpsites reviewed and inspected	Report on the inspection of the open dumpsite	
	5	No. of trainings conducted on waste characterization	Report on the conduct of trainings	
	6	No. of approved LGU SWM plan	Database on the approved LGU SWM plan	
	7	No. of workshops/writheops conducted for the updating of LGU SWM plan	Report on the conduct of workshop/writeshop	
	8	No. of approved ordinances for SWM	Database on approved ordinances	
	9	No. of sanitary system projects established	Report on the establishment of sanitary system projects	
	10	No. of studies conducted on waste water discharge from community to coastal waters	Report on conducted studies with findings, approved resolution from the PAMB before the conduct of the study, presentation of the result to the PAMB	
	11	No. of feasibility studies conducted on the use of mini Sewerage Treatment Plants (STPs), Cluster STP	Report on conducted studies with findings, approved resolution from the PAMB before the conduct of the study, presentation of the result to the PAMB	
	12	No. of hectares for public-private partnership in the management of waste water	Report on conducted studies with findings, approved resolution from the PAMB before the conduct of the study, presentation of the result to the PAMB	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
	13	No. of Waste Management Facilities	Report on the waste management facilities	
	14	No. of M&E on waste water management	Monitoring report on the waste water management to the water suppliers	
3. Disaster risk reduction planning and preparedness	1	No. of approved LGU DRRM plan	Database on the LGU DRRM plan	
	2	No. of trainings conducted on DRRM planning/updating	Report on the conduct of trainings	
	3	No. of workshops/writesops conducted for the updating of LGU DRRM plan per municipality and barangay	Report on the conduct of workshop/writeshop	
	4	No. of implemented programs for DRR	Report on the conduct of implementation of DRR programs	
	5	No. of inventoried evacuation facilities	Report on the conduct of inventory of evacuation facilities with maps and technical description	
	6	No. of conduct survey for development of evacuation centers	Report and findings on the conduct of survey	
	7	No. of inspection conducted on medical facilities in SIPLAS	Report on the conduct of inspection	
	8	No. of assessment conducted on climate and disaster Risk	Report on the conduct of assessment, presentation of findings to SIPLAS-PAMB	
	9	No. of research studies conducted	Research studies on related on natural protection and coastal erosion	
	10	No. of workshops conducted for the updating of vulnerability maps	Report on the conduct of updating vulnerability maps, vulnerability maps	
	11	No. of database on vulnerability maps	Database of maps from MGB, PHILVOLCS, PAGASA	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
4. Communication, Education and Public Awareness	1	No. of KAP Studies conducted	Report on the findings during the study of KAP	
	2	Communication Plan reviewed and updated	Updated the 5 Yr Communication Plan of SIPLAS based on findings during the study of KAP	
	3	No. of CEPA conducted	Report in the conduct of CEPA	
	4	No. of CEPA materials developed	CEPA materials procured (t-shirts, brochures, caps, video promotions, etc)	
	5	SIPLAS week conducted	Report on the activities conducted in support to SIPLAS week	
	6	No. of Flagship Species promoted for social marketing activities conducted	Report on the conduct of for social marketing activities	
	7	No. of resolutions approved by SIPLAS-PAMB for CEPA	Database of resolutions	
	8	Telecommunication companies coordinated for the dissemination of information about SIPLAS	MOA between PAMB and telecommunication companies on the dissemination of information about SIPLAS	
	9	Developed environmental education programs with DepEd for schools within SIPLAS	Report on the Environmental Education Drive Campaign about SIPLAS to the schools in Siargao and Bucas Grande Island	
	10	SIPLAS Module for school curriculum developed		
5. Development of sustainable financing schemes	1	No. of funding sources inventoried	Report on the inventory of funding sources	
	2	No. of ordinances/PAMB resolutions related to sustainable financing	Report on the enactment of ordinances/PAMB Resolution	
	3	No. of entrance fee tickets released	Report on the no. of release of entrance fee tickets	
	4	No. of approved WFP plan for IPAF	Report on the WFP for IPAF, presentation of the WFP to the SIPLAS-PAMB	
	5	No. of establishment for SAPA application inventoried	Report on the conduct of inventory of establishment for SAPA application	
	6	No. of workshops/writeshop and planning for Payment for Ecotourism Service (PES) schemes	Report on the conducted activities for Payment for Ecotourism Service (PES) schemes	
	7	No. of Resource Valuation study conducted	Report of the Resource Valuation Study	

MANAGEMENT FOCUS	INDICATORS		MOVS	EXTERNAL ASSUMPTION
D. Governance Enhancement and Institutional Strengthening				
1. Knowledge and capability building for PAMB and SIPLAS Protected Area Management Office (PAMO)	1	No. of trainings conducted for SIPLAS PAMO Personnel	Report on the conduct of trainings for SIPLAS PAMO personnel	
	2	No. of approved plantilla positions for SIPLAS PAMO	Positions description form, appointment	
	3	No. of established support facilities for PAMO operations	Report of PA facilities established and maintained	
	4	No. of SIPLAS summit conducted	Reports in the conduct of SIPLAS Summit/ Forum attended by the PAMB Members	
	5	No. of SIPLAS PAMB meetings conducted	-No. of approved PAMB Resolutions -No. of the minutes of the meeting	
3. Collaboration and resource mobilization	1	No. of approved Memorandum of Agreement, PAMB resolutions	Database of Memorandum of Agreement (MOA) and PAMB Resolution issued by SIPLAS PAMO	
4. Policy support	1	No. of PAMB Policy support	Report on the database on policy support	
5. Monitoring and evaluation of plan implementation	1	No. of monitoring, inspection and evaluation conducted	Report on the conduct of Monitoring and Evaluation, inspection and assessment	
	2	No. of impact assessment in SIPLAS		
E. General Administration and Management				
1. Institutionalize Plantilla Positions for PAMO SIPLAS staff and personnel	1	No. of approved plantilla postions for PAMO SIPLAS	Appointment, position description form.	DBM budget allocation for personnel services not hampered
2. Hiring of SIPLAS PAMO Technical and Support Staff	1	Hired SIPLAS PAMO Technical and Support Staff	-Contract of Service -Accomplishment Reports	
3. Establishment and maintenance of PAMO SIPLAS support facilities	1	No. of support facilities established and maintained	-Notice of Award, Contract agreement -Monitoring report	
4. Procurement and maintenance of equipment and vehicles, and purchase of office supplies	1	No. of equipment and vehicles, and office supplies procured	- Monitoring report	

Table 90. SIPLAS Management Focus and Activities

Management Focus	ACTIVITIES	
A. Terrestrial Management		
<i>a) Demarcation of management zones (Strict Protection Zones and Watershed Conservation Areas)</i>	1	Community consultations
	2	Fund sourcing
	3	Ground demarcation
	4	Update of SIPLAS and LGU/barangay maps, plans and ordinances to reflect established boundaries
<i>b) Biodiversity research and documentation (develop research framework and protocols,execute agreements, conduct research, develop database)</i>	1	Linkage with academic and research institutions for any recent studies undertaken or for any interest to undertake biodiversity studies in SIPLAS.
	2	Conduct research studies in SIPLAS funded by SIPLAS PAMB.
	3	Forge Agreement with research and SIPLAS-PAMB to present their initial results before leaving SIPLAS. Copy furnish SIPLAS-PAMB on the final result.
	4	SPZ which contains rich biodiversity resources will be prioritized as study areas.
	5	Develop the protocols for collaborative research in SIPLAS.
	6	Enhancement of Arboretum in SIPLAS.
<i>c) Habitat restoration and rehabilitation</i>	1	Identify and map sites for restoration/rehab; planning and fund sourcing (e.g., NGP); nesting site will be prioritized
	2	Actual restoration/rehabilitation thru NGP
	3	Maintained and enhance NGP plantation
	4	Enhance existing seed production area for SIPLAS
	5	Operationalized and maintained SPA
	6	Nursery established of indigenous species per LGU; DENR-SIPLAS PAMO will capacitate the LGU in managing it
	7	Closely coordinate with tertiary schools with regards mandatory tree planting of their graduates
<i>d) Cave Conservation and Management</i>	1	Update inventory of caves
	2	Assess and classify cave
	3	Prepare and formulate 5-year cave management plan

Management Focus	ACTIVITIES	
	4	Implement cave management plan (secure MOA and LGU and PAMB Resolutions)
	5	Update/Formulate cave management plan
	6	Conduct monitoring and evaluation of cave management
	7	Provide Group Insurance for Cave Management Focal Persons
e) Wetland Conservation and Management	1	Update inventory of wetland
	2	Assess and classify wetland
	3	Update/Prepare and formulate 5-year wetland management plan
	4	Implement wetland management plan (secure MOA and LGU and PAMB Resolutions)
	5	Conduct monitoring and evaluation
	6	Update wetland management plan
f) Wildlife Conservation and Management	1	Inventory of wildlife sighting areas/ nesting sites
	2	Assess wildlife habitats/nesting sites
	3	Establish wildlife habitat sanctuary/nesting sites
	4	Conduct inter-agency joint patrol and surveillance thru LAWIN patrol
	5	Conduct Communication, Education and Public Awareness (CEPA)
	6	Conduct monitoring and evaluation
	7	Conduct monitoring of permit holders (Wildlife Registration and Wildlife Farm Permit)
	8	Operationalize and mobilize Wildlife Traffic Monitoring Units
	9	Mobilize WEO with quarterly report including biodiversity related cases acted
g) Biodiversity Monitoring System (BMS) in four (4) terrestrial sites	1	Conduct Biodiversity Monitoring System in four (4) terrestrial sites
h) Biodiversity Assessment and Monitoring Site (BAMS) Terrestrial	1	Monitor existing BAMS
	2	Establish and implement BAMS
	1	Delineate and demarcate designated forest protection area

Management Focus	ACTIVITIES	
i) Community-based resource protection	2	Deputize DENRO (Deputized Environment and Natural Resources Officer)
	3	Conduct capability Trainings on Forest Protection and Rehabilitation
	4	Capacitize protected area communities especially PACBRMA holders
	5	Monitor and Evaluate PACBRMAs
j) Conservation of water production areas	1	Identify and assess current and potential sources of water for domestic use and irrigation
	2	Ground demarcation of identified water source
	3	Identify of resource managers, negotiation and signing of agreements with PAMB
	4	Apply permits with NWRB
	5	Prepare/update watershed management plans
	6	Management and rehabilitation by designated resource manager
k) Strengthening of Enforcement (Patrolling and Surveillance)	1	Form Bantay-Gubat formation and conduct capacity building and deputation
	2	Regular patrol and surveillance; document and report violations
	3	Apprehend undocumented forest products including NTFPs, vehicles, equipment and other implements thru proper channel
	4	Haul apprehended forest products and vehicles
	5	Immediate administrative and adjudication proceedings for apprehended forest products including conveyances, tools and implements
	6	Inventory of apprehended/confiscated forest products
	7	Support to investigation, filing and prosecution of criminal complaints
	8	Internet subscription for field offices and AILTF checkpoints
	9	Operationalize SIALEC
	10	Establish, operate and maintained check points
	11	Establish guard house
	12	Conduct CEPA related to environmental laws and policies
	13	Appropriate/allocate budget for the honorarium/monetary incentives of deputized Bantay Gubats

Management Focus	ACTIVITIES	
Socio-Economic Development		
a. Provision of land tenure security	1	Update SRPAO (Survey and Registration of Protected Area Occupants)
	2	Delineate land claims in forestlands MUZ
	3	Organize eligible claimants into POs
	4	Process appropriate tenurial instrument (PACBRMA/SAPA)
	5	Prepare management plan for tenured areas
	6	Conduct Monitoring and Evaluation of PACBRMA Implementation
b) Agroforestry farm development	1	Identify and assess current and potential sources of water for domestic use and irrigation
	2	Delineate agroforestry farms;
	3	Conduct training on SWC and farm planning
	4	Farm develop and maintain agroforestry
	5	Produce/procure of planting material
	6	Conduct soil sampling and analysis
	7	Implement Sloping Agricultural Land Technology (SALT)
c) Fuelwood plantation and woodlots development	1	Validate areas; identify farmer beneficiaries
	2	Prepare farm plans; identify funding sources
	3	Establish plantations (with technical assistance in sourcing planting materials)
	4	Secure necessary permits (PAMB Clearance, appropriate tenural instruments)
	5	Develop and implement Fuelwood Plantation
	6	Employ silvicultural practices
	7	Implement selective cutting
	8	Monitor and evaluate of Fuelwood Plantation and woodlots development
e) Development and Implementation of Biodiversity	1	Identify and conduct feasibility assessment of potential community enterprises; identify of potential funding sources
	2	Organize and strengthen PO; conduct training on enterprise and financial management

Management Focus	ACTIVITIES	
Friendly Enterprise (BDFE) and other livelihood activities	3	Prepare of business plans; extend assistance in initial operations; link with markets and support facilities
	4	DENR and LGU shall seek funds for livelihood and tap other agencies such as DOLE, DA, etc.
	5	Implement BDFE and other livelihoods
	6	Implement Women Related livelihood projects
B. Coastal and Marine Resources Management		
5. Delineate SIPLAS Boundary and Management Zone based on the DAO 2019-05 updated Technical Description	1	Demarcate SIPLAS Boundary and Management Zone in coastal areas
6. Coastal habitat and species conservation		
a) Identification of Wildlife habitat/nesting sites and demarcation of management zones (SPZ)	1	Conduct inventory to the Identified wildlife nesting sites
	2	Conduct community consultations
	3	Fund sourcing
	4	Demarcate areas
	5	Update SIPLAS and LGU/barangay maps, plans, ordinances to reflect established boundaries
	6	Implement Biodiversity Assessment Monitoring System (BAMS) for marine
	7	Conduct monitoring and evaluation
b) Management of MPAs	1	Validate location and areas of individual MPAs
	2	Conduct participatory preparation of individual MPA management plans; legitimize and lobby for approve PAMB
	3	Protect and manage individual MPAs to designated MPA managers
	4	Demarcate and re-install boundary bouys
	5	Review/update initial MPA Network Action Agreement and Plan
	6	Conduct joint activities: CEPA, enforcement and M and E
	7	Periodic MPA Network Forum and MPA effectiveness assessment (MEAT and NEAT)
	8	Conduct Monitoring and Evaluation of MPA Management Plan Implementation

Management Focus	ACTIVITIES	
c) Seagrass Monitoring	1	Conduct Seagrass Assessment Habitat Focus
	2	Conduct Seagrass Assessment and Monitoring threat focus
d) Coral rehabilitation	1	Identify and assess suitable sites
	2	Conduct consultation with coral rehab experts
	3	Rehabilitate, protect and maintained coral rehabilitation sites (with necessary training)
	4	Install ARs (use indigenous materials)
	5	Prepare of coral rehab plan and budget
	6	Conduct monitoring and Fish Visual Census (FVC) with focus on threats
	7	Fund Source
e) Mangrove protection and rehabilitation	1	Identify areas for enhancement
	2	Establish and maintain nurseries for propagule and seedling production
	3	Implement Adopt NGP Programs
	4	Enhance mangrove reforestation under abandoned unlicensed fish ponds
	5	Assess/monitor mangrove area with focus on threat
	6	Maintain and protect enhance mangrove area
	7	Mobilize communities and partners/stakeholders for mangrove planting
	8	Mobilize communities for maintenance and protection of mangrove rehabilitation areas
	9	Install signage and conduct CEPA
	10	Conduct water quality monitoring in recreational, mouth of river, marine sanctuaries
	11	Conduct seaborne patrol
	12	Conduct technical assistance to LGU's on coastal and marine related concerns
	13	Water resource disaster response plan crafted
	14	Implement Water resource disaster response plan (monitoring)

Management Focus	ACTIVITIES	
f) Biodiversity Monitoring System (BMS) in four (4) marine sites	1	Conduct Biodiversity Monitoring System in four (4) marine sites
3. Fisheries management	1	Institutionalize SIALEC
	2	Facilitated signing of inter-LGU Fisheries Enforcement MOA
	3	Reactivate/strengthen municipal and barangay FARMCs
	4	Create/strengthen of Bantay Dagat teams; conduct enforcement training
	5	Enact unified fisheries ordinances
	6	Enforce unified registration and licensing systems; open and closed seasons
	7	Conduct Wildlife Trafficking and Monitoring (WTM)
	8	Inventory of unlicensed fish cages
	9	Conduct Technical Assistance to the LGUs
	10	* Recognize the NAMRIA approved municipal water boundaries for LGU management (PAMB approved resolution) for opinion of PENRO-TWG
4. Foreshore Management	1	Inventory of existing uses and development in foreshore areas
	2	Process appropriate permits and tenurial instruments (SAPA)
	3	Conduct monitoring and evaluation on Foreshore areas
5. Easement Management	1	Inventory of existing infrastructure and other development facilities
	2	Demarcate easement
	3	Recover easement
	4	Issuance of notice of violation
	5	Conduct monitoring and evaluation
5) Development and Implementation of Biodiversity Friendly Enterprise and other livelihood activities	1	Identify and conduct feasibility assessment of alternative livelihood activities and funding sources
	2	Organize and strengthen PO; conduct training on enterprise and financial management
	3	Assist in initial operations; link with markets and support facilities
	4	Implement BDFE and other livelihoods
	5	Implement community based ecotourism and related livelihood activities

Management Focus	ACTIVITIES	
C. Cross Cutting Management		
1. Eco-tourism development	1	Review/update of SIPLAS Eco-tourism Management Plan
	2	Update list of ecotourism sites
	3	Formulate site-specific ecotourism management plan
	4	Update Site specific ecotourism management plan
	5	Review of current operations, physical development plan and marketing plans for current tourism sites; refinement of plans
	6	Forge agreements with tourism operators and ecotourism site managers on biodiversity conservation and responsible tourism
	7	Coordinate with DOT and other tourism organizations for promotion of responsible ecotourism
	8	Review of Special Use Agreement for PA with establishments along easement
	9	Review gamefishing regulations for sustainable fisheries
	10	Review ecologocial impact of potential cruise ship operations
	11	Review of Provincial Tourism Master Plan that will anchor in the SIPLAS Management Plan
	12	Implement regulations on responsible anchoring practices of pumpboats
	13	Review of tourism activities within SPZ
	14	Conduct and implement site-specific research studies on Carrying Capacity of the ecotourism destinations
	15	Conduct carrying capacity study of entire SIPLAS
2. Waste management	1	Charactize waste materials
	2	Train, design cluster/integrated SWM facilities and appropriate WWM facilities for major point sources
	3	Enact ordinances
	4	Quarterly review and physical inspection of open dumpsites
	5	Conduct studies on waste water discharge from barangay to coastal waters
	6	Conduct studies on the use of mini Sewerage Treatment Plants (STPs) for the management of waste water

Management Focus	ACTIVITIES	
	7	Establish sanitary system projects and fund sourcing
	8	Conduct STP feasibility study
	9	Implement public-private partnership in the management of waste water
	10	Review the responsibility of water suppliers with regards to waste water management
	11	Conduct Communication, Education and Public Awareness
	12	Update, review and implement LGU SWM and WWM Plan
	13	Establish and inspect Residual Containment Area (RCA)
3. Disaster risk reduction planning and preparedness	1	Review/update of LGU DRRM plans
	2	Formulate municipal and barangay DRRM plans
	3	Conduct training on DRR planning
	4	Implement disaster readiness programs
	5	Research natural protection vs. coastal erosion
	6	Review municipal medical facilities
	7	Conduct climate and Disaster Risk Assessment
	8	Identify and develop safe evacuation and resettlement sites
	9	Secure hazard maps from MGB,PAGASA,PHILVOLCS
	10	Update the vulnerability maps
4. Communication, Education and Public Awareness	1	Review/update communication plan supporting all programs
	2	Develop CEPA materials
	3	Mobilize LGU and other partners for LGU level and PA-wide CEPA
	4	Celebrate SIPLAS Week
	5	Promote SIPLAS Super Squad Flagship Species for social marketing
	6	Develop environmental education programs with DepEd for schools within SIPLAS
	7	Develop SIPLAS Module for school curriculum
	8	Coordinate with Telecommunication companies for the dissemination of information about SIPLAS

Management Focus	ACTIVITIES	
5. Development of sustainable financing schemes	1	Identify potential activities for Payment for Ecosystem Services (PES)
	2	Review/study user fees: adequacy, collection systems (entrance fee), collection efficiency
	3	Identify potential activities for Resource Valuation studies
	4	Develop and implement Payment for Ecotourism Service (PES) schemes
	5	Utilize and manage IPAF collection
	6	Implement the collection of entrance fee from tourists
	7	Forge potential SAPA to qualified applicants
	8	Enact ordinances/PAMB resolutions related to sustainable financing
	9	Inventory all potential funding sources;
	10	Monitoring and Evaluation on sustainable financing
D. Governance Enhancement and Institutional Strengthening		
1. Knowledge and capability building for PAMB and SIPLAS Protected Area Management Office (PAMO)	1	Conduct capacity building trainings (e.g., coordination, planning, M and E) SIPLAS PAMO personnel and PAMB members
	2	Conduct SIPLAS Summit
	3	Conduct PAMB meeting (executive committee, En Banc, and Sub-Committee)
2. Collaboration and resource mobilization	1	Facilitate and forge agreements with various stakeholders on protected area management
3. Policy support	1	Develop policy agenda
	2	Establish database on Policy support
	3	Conduct PAMB meetings (ExeCom, <i>En Banc</i> , Sub-Committee)
4. Monitoring and evaluation of plan implementation	1	Establish baseline and develop database
	2	Monitor results on management effectiveness
	3	Conduct impact assessment

Management Focus	ACTIVITIES	
E. General Administration and Management		
1. Institutionalize Plantilla Positions for PAMO SIPLAS staff and personnel	1	Fill-up SIPLAS PAMO Plantilla positions
2. Hiring of SIPLAS PAMO Technical and Support Staff	1	Hiring of personnel through contract of service
3. Establishment and maintenance of PAMO SIPLAS support facilities	1	Construct support facilities
	2	Maintenance of facilities
4. Procurement and maintenance of equipment and vehicles, and purchase of office supplies	1	Facilitate purchase requests and order for equipment and vehicles, and office supplies
	2	Maintenance of equipment and vehicles

IX. 10-YEAR SIPLAS FINANCIAL PLAN

9.1 Overview of Current Budget Allocation and Revenues

One of the core goal of the SIPLAS 10-year plan is to promote equity among local communities through sustainable livelihoods including community based ecotourism, social services and broader benefit-sharing mechanisms. In order to meet this goal, the SIPLAS PAMB formulated the SIPLAS 10-year Financial Plan which calculated the budget requirements of all activities including the revenues and schemes for sustainable management.

The previous CY 2015-2020 management plan budget is Php 220,807,933.00 that lay down the protection, rehabilitation and effective on-site management of SIPLAS and funded the five (5) management programs/focus namely; 1) Terrestrial, 2) Coastal and Marine Resources Management, 3) Cross Cutting, 4) Governance Enhancement and Institutional Strengthening, and 5) General Administration and Management. Sources in the implementation of activities were from regular General Appropriations Act (GAA) funding the respective Work and Financial Plan of each fiscal year within the implementation plan period.

While, the overall funding requirement for the 10-year implementation plan is Php 555,713,720 as shown in Table 91. The terrestrial management has the highest funding demand of the five (5) main management focus at Php 190,700,000 or 34% of the overall projected implementation expense which is similar to the previous CY 2015-2020 SIPLAS Management Plan. A considerable portion of this budget would go toward socio-economic growth, mainly agroforestry development and water conservation and management. Although the latter two component activities will increase local households' incomes and water protection, they will also make a major contribution to improving forest cover and biodiversity conservation.

The second highest projected budget allocation for the ten (10) year implementation plan is the coastal and marine resources management with a cumulative budget of Php 147,120,500 or 26% of the overall projected implementation expense. Considering that the biggest portion of the protected area is marine, coastal habitat and species restoration are the priority activities which includes mangrove preservation and regeneration, reef rehabilitation, and MPA management. This portion will receive additional funding from other sources such as LGUs and NGOs.

The cost of general administrative and personnel support for the PAMO operations is projected to be Php 110,508,220 equivalent 20% of the overall implementation cost. This management focus includes personnel costs, administrative expenses, establishment and enhancement of facilities and the purchase of necessary equipment are all covered.

The criteria for the governance enhancement and institutional growth are the simplest. This initiative, which is primarily centred on the PAMB and PASu staff's continued capacity building, policy support activities, and monitoring and assessment activities, would require a budget of Php 55,140,000 equivalent to 10% of the overall implementation cost.

The cross-cutting management would cost a total of Php 52,245,000 equivalent to 9% of the overall implementation cost and will include eco-tourism, waste management, disaster risk mitigation, CEPA, and environmental sustainability. It should be remembered that this management focus budget projection excludes facilities and equipment funding for program components such as eco-tourism, waste management, and disaster risk reduction and management. The cost estimates exclude the installation of physical infrastructure in ecotourism areas, a cluster sanitary landfill, materials recycling facilities, and suitable point-source wastewater treatment facilities for waste management, and resettlement sites for DRRM, as these can only be decided once comprehensive plans are established.

Table 91. Ten-Year Budget Requirements of the SIPLAS Management Plan Implementation

Management Focus	UWM	Unit Cost	Estimated Costs (thousand pesos)										
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
A. Terrestrial Management			23,358,000	24,608,000	26,078,000	23,758,000	21,818,000	15,258,000	14,758,000	14,258,000	14,648,000	12,158,000	190,700,000
1. Biodiversity Protection and Conservation													
a. Demarcation of management zones (strict protection zone and watershed conservation areas)	No. of kilometers	2,000/monument marker	2,000,000	800,000			315,000				140,000		3,255,000.00
b) Biodiversity research and documentation (develop research framework and protocols, execute agreements, conduct research, develop database)	No. of research conducted	500,000.00		500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	300,000	4,300,000.00
c) Habitat restoration and rehabilitation	No. of hectare	26,000.00/hectare	9,608,000	9,608,000	9,608,000	9,608,000	8,178,000	3,208,000	3,208,000	2,708,000	2,708,000	2,708,000	61,150,000.00
d) Cave Conservation and Management	No. of caves assessed	250,000/cave	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000.00
e) Wetland Conservation and Management	No. of wetland assessed	250,000/wetland	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000.00
f) Wildlife Conservation and Management	No. of activity/ MOA	500,000.00	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000.00
g) Biodiversity Monitoring System (BMS) of four (4) terrestrial sites	No. of BMS site	125,000/PA	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	1,250,000.00
h) Biodiversity Assessment and Monitoring Site (BAMS) Terrestrial Site	No. of BAMS site	1,000,000/site		1,000,000			300,000						1,300,000.00
i) Conservation of water production areas	No. of watershed	225,000/watershed	225,000	225,000	225,000	225,000	450,000	225,000	225,000	225,000	225,000	225,000	2,475,000.00

Management Focus	UWM	Unit Cost	Estimated Costs (thousand pesos)										
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
j) Community-based resource protection	No. of site	500,000/site	1,250,000	1,250,000	1,250,000	1,250,000	500,000	500,000	500,000	500,000	500,000	500,000	8,000,000.00
k) Strengthening of Enforcement (Patrolling and Surveillance)	No. of kilometers	10,000/ every 10 km	4,500,000	4,500,000	5,000,000	5,000,000	4,500,000	4,500,000	4,500,000	4,500,000	5,000,000	5,000,000	47,000,000.00
2. Socio-Economic Development													
a.) Provision of land tenure security (PACBRMA)	No. of hectare	250,000/PACBRMA	200,000	300,000	3,070,000	550,000	450,000	450,000	450,000	450,000	200,000	100,000	6,220,000.00
b) Agroforestry farm development	No of hectare	26,000/hect are	2,750,000	3,100,000	3,100,000	3,100,000	3,100,000	3,100,000	2,600,000	2,600,000	2,600,000	600,000	26,650,000.00
c) Fuelwood plantation and woodlots development	No. of hectare	26,000/hect are		300,000	300,000	500,000	600,000	100,000	100,000	100,000	100,000	100,000	2,200,000.00
d) Development of BDFE and other livelihood activities	No. of PACBRMA	500,000/PACBRMA holder	1,200,000	1,400,000	1,400,000	1,400,000	1,300,000	1,050,000	1,050,000	1,050,000	1,050,000	1,000,000	11,900,000.00
B. Coastal and Marine Resources Management			16,855,500	16,905,000	19,655,000	19,355,000	18,655,000	12,455,000	11,985,000	10,735,000	10,435,000	10,085,000	147,120,500
1. Delineation of SIPLAS Boundary	No. of kilometers	5,000,000/ PA		1,625,000	1,625,000	1,625,000	1,625,000						0
2. Coastal habitat and species conservation													
a) Identification of local conservation habitats and demarcation of management zones	No. of local conservation habitat	300,000/ Local conservation habitat	1,000,500	1,050,000	1,350,000	600,000	300,000	300,000	1,050,000	100,000			5,750,500
b) Management of MPAs	No. of MPA	100,000/ MPA	3,650,000	3,650,000	3,650,000	3,650,000	3,650,000	3,400,000	3,400,000	3,150,000	3,150,000	3,150,000	34,500,000
c) Seagrass monitoring	No. of hectare	250/ hectare	250,000	250,000	250,000	300,000	250,000	250,000	300,000	250,000	250,000	300,000	2,650,000
d) Coral rehabilitation	No. of coral rehabilitation	300,000/ Municipality	150,000	150,000	350,000	750,000	750,000	550,000	550,000	550,000	550,000	150,000	4,500,000

Management Focus	UWM	Unit Cost	Estimated Costs (thousand pesos)										
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
e) Mangrove protection and rehabilitation	No. of hectare	30,000/ hectare	3,175,000	3,175,000	3,275,000	3,375,000	3,375,000	3,250,000	3,150,000	3,150,000	3,150,000	3,150,000	32,225,000
f) Biodiversity Monitoring System (BMS) in four (4) marine sites	No. of BMS site	125,000/ PA	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000	1,250,000
3. Fisheries management	No. of activity (Unified Ordinance, TWG meeting)	100,000/ activity	5,960,000	5,960,000	6,160,000	6,060,000	5,860,000	460,000	360,000	360,000	360,000	360,000	31,900,000
4. Foreshore Management	No. of SAPA	50,000/ activity	50,000	50,000	200,000	200,000	200,000	100,000	100,000	100,000	100,000	100,000	1,200,000
5. Easement Management	No. of easement of municipality	200,000/ activity	2,370,000	2,370,000	1,370,000	1,370,000	1,220,000	1,220,000	150,000	150,000	150,000	150,000	10,520,000
6. Development and implementation of Biodiversity Friendly Enterprise and other livelihood activities	P.O each municipality	800,000/ PO	125,000	125,000	2,925,000	2,925,000	2,925,000	2,800,000	2,800,000	2,800,000	2,600,000	2,600,000	22,625,000
C. Cross-Cutting Management			1,725,000	10,195,000	9,475,000	6,775,000	6,175,000	4,150,000	3,450,000	3,550,000	3,800,000	2,950,000	52,245,000
1. Eco-tourism development	No. of ecotourism site	300,000/ ecotourism site	150,000	3,170,000	1,850,000	1,450,000	1,050,000	1,050,000	1,050,000	1,050,000	1,200,000	1,200,000	13,220,000
2. Waste management	No. of activity	300,000/ activity	125,000	2,575,000	2,475,000	1,075,000	975,000	1,000,000	400,000	500,000	400,000	500,000	10,025,000
3. Disaster risk reduction planning and preparedness	No. of activity	150,000/ LGU	350,000	2,750,000	2,750,000	2,550,000	2,450,000	900,000	800,000	800,000	800,000	50,000	14,200,000
4. Communication, Education and Public Awareness	No. of activity	500,000/ activity	1,000,000	1,300,000	2,000,000	1,300,000	1,300,000	1,000,000	1,000,000	1,000,000	1,200,000	1,000,000	12,100,000
5. Development of sustainable financing schemes	No. of activity	50,000/ activity	100,000	400,000	400,000	400,000	400,000	200,000	200,000	200,000	200,000	200,000	2,700,000

Management Focus	UWM	Unit Cost	Estimated Costs (thousand pesos)										
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
D. Governance Enhancement and Institutional			4,954,000	5,754,000	5,354,000	5,754,000	5,354,000	5,754,000	5,354,000	5,754,000	5,354,000	5,754,000	55,140,000
1. Knowledge and capability building for PAMB and SIPLAS PAMO	No. of capability building conducted	400,000/ activity	400,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	7,600,000
2. Hiring of SIPLAS PAMO Technical and Support Staff	Approved contract of service	3,704,000/ year	3,704,000	3,704,000	3,704,000	3,704,000	3,704,000	3,704,000	3,704,000	3,704,000	3,704,000	3,704,000	37,040,000
3. Collaboration and resource mobilization	No. of activity	150,000/ activity	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000
4. Policy support	No. of activity	500,000/ activity	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,500,000
5. Monitoring and evaluation of plan implementation	No. of activity	600,000/ activity	600,000	1,000,000	600,000	1,000,000	600,000	1,000,000	600,000	1,000,000	600,000	1,000,000	8,000,000
E. General Administration and Management			16,920,822	10,020,822	10,020,822	10,220,822	10,320,822	12,020,822	10,220,822	10,020,822	10,520,822	10,220,822	110,508,220
1. Personnel Services			6,890,822	6,890,822	6,890,822	6,890,822	6,890,822	6,890,822	6,890,822	6,890,822	6,890,822	6,890,822	68,908,220
2. Capital Outlay			6,900,000	0	0	200,000	0	2,000,000	200,000	0	500,000	200,000	10,000,000
*IT Equipment	No. of IT equipment	40,000/ IT equipment	400,000			200,000			200,000			200,000	1,000,000
*Office Vehicle (Van, Pick-up truck)	No. of office vehicle	2,000,000/ office equipment	2,000,000					2,000,000					4,000,000
*Speed Boat	No. of speed boat	2,000,000/ speedboat	2,000,000										2,000,000
*Motorcycles	No. of motorcycle	250,000/ motorcycle	500,000										500,000
*Pumpboat	No. of pumpboat	250,000/ pumpboat	500,000										500,000
*Diving Equipment	No. of diving equipment	200,000/ diving set	1,500,000								500,000		2,000,000

Management Focus	UWM	Unit Cost	Estimated Costs (thousand pesos)										
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
* Establishment and maintenance of PA Facilities (PAMO Office, Watch Tower, Mangrove View Deck, two (2) Paghungawan Marsh Tower, Sohoton and Tagbuyakhaw Ranger Station)	No. of PA facility	187,500/ PA Facility	2,230,000	2,230,000	2,230,000	2,230,000	2,230,000	2,230,000	2,230,000	2,230,000	2,230,000	2,230,000	22,300,000
3. MOOE (Office Operating Expenses, maintenance)			900,000	900,000	900,000	900,000	1,200,000	900,000	900,000	900,000	900,000	900,000	9,300,000
GRAND TOTAL			63,813,322	67,482,822	70,582,822	65,862,822	62,322,822	49,637,822	45,767,822	44,317,822	44,757,822	41,167,822	555,713,720.00

a) Current budget allocation

SIPLAS is financially assisted largely from the General Appropriations Act (GAA). Current budget allocation in SIPLAS is shown in Table 92. For CY 2020 implementation plan, SIPLAS has an allocated budget of Php 12,584,936.00 to mobilized six (6) programs.

Table 92. SIPLAS budget allocated for CY 2020

Projects/Activities	Financial allocation (Php)	Expense
Natural resources enforcement and regulatory program	1,922,000.00	Personnel services, permit issuance, protected areas, caves, wetlands, development and management, wildlife resources conservation, coastal and marine ecosystem rehabilitation
Protected Areas, Caves and Wetlands Development and Management program	4,036,000.00	Protected area habitat protection, Personnel services, PAMB operations, maintenance of PA facilities, cave and wetland assessment and classification
Wildlife resources conservation program	320,000.00	Conservation and Protection of Wildlife
Coastal and marine ecosystems rehabilitation program	3,150,000.00	Water quality, maintenance and protection of coastal and marine ecosystem, technical assistance component
General Administration Support	100,000.00	Personnel services, Data management, system development and maintenance, monitoring plans, policies and programs
Land Management program	40,000.00	Residential free patent under RA 10023, resolution and land disputes, land records maintenance
National Greening Program	3,016,936.00	Seedling production, maintenance and protection
TOTAL	12,584,936.00	

b) Current revenues

In contrast to the safety and rehabilitation activities to be carried out under SIPLAS, the proposed amount of funding for the protected area is deemed inadequate. The SIPLAS PAMO has begun charging fees for the use of resources within SIPLAS to augment government support. Despite the potential of Siargao Islands, data from the Integrated Protected Area Fund (IPAF) collections since 2005 indicate that inflows have been poor and erratic in the last seven (7) years. The IPAF Deposits from 2015 until June 2021 is presented in Table 93.

Table 93. IPAF Deposits from 2015 to 2021

Year	Regular Fund (Php)	IPAF	Total Yearly Collection (Php)
		(PA-RIA and SAGF) (Php)	
2015	23,574.51	38,250.00	61,824.51
2016	46,578.37	40,941.98	87,520.35
2017	73,489.75	106,595.05	180,084.80
2018	165,279.60	273,502.98	438,782.58
2019	234,123.24	1,945,958.93	2,180,082.17
2020	160,844.90	2,206,187.89	2,367,032.79
2021 (As of June)	126,676.08	314,422.02	441,098.1
Total	830,566.45	4,925,858.85	5,756,425.30

Source: SIPLAS PAMO, CY 2021

9.2. Capital requirements

The proposed Activity-Based Cost Accounting allocation for SIPLAS 10 Year Implementation Plan is explicated in Table 94. These identifies all detailed activities and assigns cost for each program according to the specific budget items (i.e. personnel, meetings, travels, supplies, etc.). This also facilitates effective implementation when confronted with budget constraints as information generated provides required budget information per activity which will allow PAMO Office to realign budget costs and make other adjustments as necessary.

Capital requirements will focus on the institution-building cost, recurring capital requirements, proposed management and financial scenario, and revenue shortfall.

Table 94. Activity-Based Cost Accounting (ABC) Framework of SIPLAS

Management Focus	Personnel/ Core Staff (Php)	Professional Services and Consultants (Php)	Infrastructure, equipment, furniture, vehicle (Php)	Meetings, Workshops and Special Events (Php)	Travel (Php)	Supplies and Materials (Php)	Printing, Publication and Reproduction Services (Php)	Utilities- Electricity, Water, Communication (data and print) (Php)	Incentives (law enforcement, livelihood, etc.) (Php)	Miscellaneous (Insurance, registration, repair, etc.) (Php)	TOTAL (Php)	%
A. Terrestrial Management	0	10,000,000.00	0	58,400,000.00	13,800,000.00	81,400,000.00	0	0	26,700,000.00	400,000.00	190,700,000.00	34.32%
B. Coastal and Marine Resources Management	0	18,500,000.00	0	19,000,000.00	27,900,000.00	54,970,500.00	750,000.00	0	26,000,000.00	0	147,120,500.00	26.47%
C. Cross- Cutting Management	0	4,475,000.00	300,000.00	13,670,000.00	18,300,000.00	8,500,000.00	2,000,000.00	0	5,000,000.00	0	52,245,000.00	9.40%
D. Governance Enhancement and Institutional Strengthening	37,040,000.00	0	0	7,848,000.00	5,000,000.00	2,500,000.00	0	0	2,752,000.00	0	55,140,000.00	9.92%
E. General Administration and Management	68,908,220.00	0	8,800,000.00	5,000,000.00	2,500,000.00	19,300,000.00	0	6,000,000.00	0	0	110,508,220.00	19.89%
SUB-TOTAL:	105,948,220.00	32,975,000.00	9,100,000.00	103,918,000.00	67,500,000.00	166,670,500.00	2,750,000.00	6,000,000.00	60,452,000.00	400,000.00		
									GRAND TOTAL		555,713,720.00	100%

a) Institution-Building Costs

The institution building costs defines the start-up funds needed in pursuing the most viable sources or revenues for the protected area.

The highest demand will be in the Supplies and Materials estimated to be Php 166,670,500.00. These specifies the procurement of the office, workshops and field supplies, including survey materials and data purchases (e.g. maps and images).

The second highest will be the The Personnel/Core Staff services such as hiring of Forest Extension Officers (FEO), Monitoring Staffs (Biologists), Coastal Extension Officers (CEO), Administrative staffs and other support staffs has an estimated budget of Php 105,948,220 including the total amount for full-time, part –time and temporary staff salaries including fringe benefits.

Meetings and Special Events such as PAMB Meetings, LWG Meetings, SIPLAS Week Celebrations and other important meetings and events covers the estimated budget of Php 103,918,000. These costs incurred for meetings, workshops, surveys, trainings, focused group discussions, consultations, and other specific activities as stated in the management programs/focus.

The budget for travel expenses is also high with a cost of Php 67,500,000. This includes the estimated costs for transportations and per diems of all SIPLAS PAMO personnel. Similarly, Incentives particularly the law enforcement honorarium provided to the community members (i.e. Bantay Gubat, Bantay Dagat), PAMB Members during their travels, livelihood programs such as the Biodiversity Friendly Enterprises, community –based ecotourism programs and other related costs for the provision of the alternative livelihood programs is estimated to be Php 60,452,000. This will acquire the main goals in the management plan which is the to promote equity among local communities through sustainable livelihoods.

Short-term project staff/consultants/Professional Services includes the costs of hiring professional consultants with special or highly technical has an overall estimate budget allocation of Php 32,975,000. These activities refer to the formulation of the management plans, habitat assessments, and short-term programs which is highly required the research experts such as the academe institutions and professional consultants.

Establishment of Infrastructures, facilities, and purchasing of equipment, furniture, and vehicles has an estimated allocated budget of Php 9,100,000. The budget for utility expenses which includes the corresponding cost for electricity, water and communications incurred with Php 6,000,000 for ten (10)-year plan. Whereas, the budget for printing and publications including the reproduction development has a total of Php 2,750,000. Miscellaneous expenses including the insurance, registration, and repair of facilities has a total cost of Php 400,000. Furthermore, the budget of the 10-year summary per line item is expounded in Table 95.

Table 95. Ten (10) year budget summary per item in SIPLAS

Line Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL	%
Personnel/ Core Staff	10,594,822.00	10,594,822.00	10,594,822.00	10,594,822.00	10,594,822.00	10,594,822.00	10,594,822.00	10,594,822.00	10,594,822.00	10,594,822.00	105,948,220.00	19%
Professional Services and Consultants	5,100,000.00	6,050,000.00	2,900,000.00	2,000,000.00	2,000,000.00	6,975,000.00	600,000.00	600,000.00	750,000.00	6,000,000.00	32,975,000.00	6%
Infrastructure, equipment, furniture, vehicle	910,000.00	910,000.00	910,000.00	910,000.00	910,000.00	910,000.00	910,000.00	910,000.00	910,000.00	910,000.00	9,100,000.00	2%
Meetings, Workshops and Special Events	10,318,000.00	10,400,000.00	10,400,000.00	10,400,000.00	10,400,000.00	10,400,000.00	10,400,000.00	10,400,000.00	10,400,000.00	10,400,000.00	103,918,000.00	19%
Travel	6,500,000.00	6,700,000.00	6,750,000.00	6,750,000.00	6,700,000.00	6,800,000.00	6,800,000.00	6,800,000.00	6,850,000.00	6,850,000.00	67,500,000.00	12%
Supplies and Materials	14,600,000.00	15,900,000.00	15,900,000.00	16,800,000.00	16,800,000.00	16,720,000.00	17,750,000.00	17,600,500.00	17,300,000.00	17,300,000.00	166,670,500.00	30%
Printing, Publication and Reproduction Services	275,000.00	275,000.00	275,000.00	275,000.00	275,000.00	275,000.00	275,000.00	275,000.00	275,000.00	275,000.00	2,750,000.00	0%
Utilities- Electricity, Water, Communication (data and print)	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	6,000,000.00	1%
Incentives (law enforcement, livelihood, etc.)	5,000,000.00	6,452,000.00	6,500,000.00	6,500,000.00	6,500,000.00	6,500,000.00	6,500,000.00	6,500,000.00	5,000,000.00	5,000,000.00	60,452,000.00	11%
Miscellaneous (Insurance, registration, repair, etc.)	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	400,000.00	0%
TOTAL	53,937,822.00	57,921,822.00	54,869,822.00	54,869,822.00	54,819,822.00	59,814,822.00	54,469,822.00	54,320,322.00	51,969,822.00	58,719,822.00	555,713,720.00	100%

b) Recurring Capital Requirements

Based on Table 90, the items on a) professional services and consultants, b) meetings, workshops and special events, c) travel, d) supplies and materials, and e) incentives are the recurring capital requirements. For the 10-year implementation period, the highest capital requirements are supplies and materials, and workshops and special events incurring Php 166,670,500.00 and Php 103,918,000.00, respectively.

c) Proposed Management and Financial Scenario

This refers to the current revenue or sources of funds and revenue streams. This plan will also be communicated further to relevant stakeholders to address the funding gap.

Budget allocation: General Appropriations Act (GAA)

The PASu, in consultation with the Regional Director and Biodiversity Management Bureau, should identify financial resources that can be allocated by the DENR. This should be reflected in the Annual Work and Financial Plan of the protected area and submitted through regular budgeting procedures of the government. This particular item may include the administrative cost of the protected area management.

For SIPLAS, previous annual allocation ranges from Php 17 Million to Php 31 Million which funded enforcement, coastal and marine ecosystem rehabilitation and management, national greening program, wildlife resources conservation, patent titling, and protected area development and management. To date, meager budget is allocated for activities related to protected area management and biodiversity conservation.

Partners and NGO's allocations

There are several partner NGO's that operates in SIPLAS which cater some of the activities identified in the plan. This is particularly in the coastal and marine resources management sector, fishery, Communication, Education and Public Awareness (CEPA), Solid Waste Management, and livelihood. These NGO's include Rare Philippines Incorporated, Sustainable Interventions for Biodiversity, Oceans and Landscapes (SIBOL), *Sentro para sa Ikaunlad ng Katutubong Agham at Teknolohiya* (SIKAT), and Sea Movement.

Local Government Units within SIPLAS

There are nine (9) Local Government Units (LGUs) within SIPLAS that have also allocation for coastal resource management, solid waste management, and disaster risk reduction. The LGUs are expected to continue budgeting for their fisheries management operations as these are devolved functions. As protected area managers, LGUs shall allocate budget for protected area management.

d) Revenue Shortfall

Revenue shortfall refers to the funding gap that will sufficiently fund the implementation of the 10-year management plan. The total budget needed is Php 555,713,720.00 to implement the five (5) major management focus and its activities.

PAMB Resolution No. 2014-09, which was approved on March 27, 2014, provided a rough estimate of the revenue that could be created for SIPLAS. SIPLAS should expect to produce potential revenues of Php 26,612,500 million (net of central IPAF share) within 10 years if management and the LGUs are adamant about fund generation and fee collection efforts. The revenues are made up of PES wages, various taxes, licenses, fines, and penalties, as shown in Table 96.

Table 96. Estimated Annual Revenues from Various Sources (in Php)

Revenue Sources	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
PES (Water Districts, Forshore development)	280,000	308,000	338,000	372,000	400,000	428,000	456,000	484,000	512,000	540,000	4,118,000
Conservation Fee	150,000	165,000	180,000	200,000	220,000	240,000	260,000	280,000	300,000	320,000	2,315,000
Resource Use Fees											
*Quarrying	500,000	550,000	600,000	650,000	700,000	750,000	800,000	850,000	900,000	950,000	7,250,000
*Fish Cages	50,000	55,000	60,000	65,000	70,000	75,000	80,000	85,000	90,000	95,000	725,000
*Resorts	210,000	230,000	250,000	270,000	290,000	310,000	330,000	350,000	370,000	390,000	3,000,000
Development Fees	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000
Concession Fees	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000
Entrance Fee	200,000	220,000	242,000	265,000	292,000	322,000	354,000	391,000	431,000	473,000	3,190,000
Permits	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	200,000
Other Income (Fines and Penalties)	100,000	110,000	120,000	130,000	140,000	150,000	160,000	170,000	180,000	190,000	1,450,000
Less: Share of Central IPAF	474,000	511,000	551,700	595,000	642,500	679,500	716,500	753,500	790,500	827,500	864,500
TOTAL	2,334,000	2,519,000	2,711,700	2,917,000	3,124,500	3,324,500	3,526,500	3,733,500	3,943,500	4,155,500	26,612,500

This means that in order to carry out the programme, the PAMB and PASu would need to expand and intensify their resource generation efforts. The NGP, DENR, the Province, and the nine (9) LGUs and their barangays will provide additional funding for SIPLAS' programs and activities. Proposals for grants and contributions from Overseas Development Assistance donors, private businesses, and individuals can be written and submitted based on the programs listed in the plan.

9.3. Revenue Generation Strategy

These are the detailed strategies, next steps and investments required to capitalize on the most viable opportunities. These include the following:

- **Project/partner identification.** The PASu should identify potential conservation projects by other institutions that maybe able to cover some components of the Financial Plan and negotiate possible partnerships through forging of memorandum of agreement.
- **Stakeholders' forum.** The PAMB should initiate a forum to present the protected area Financial Plan to priority stakeholders. It is important that prior to this activity, the PAMB, through the protected area staff, identify potential funding partners that maybe able to fill in the financial gaps of the Financial Plan.
- **Social marketing.** The SIPLAS PAMO, supported by the concerned DENR regional office, should prepare and initiate social marketing of the Financial Plan to ensure that the funding requirements of the protected area management are met. The marketing strategy may involve presentation and lobbying with local development councils and *sanggunians* for the allocation of certain funds, particularly in biodiversity protection measures and socio-economic requirements of communities; establishing partnership with conservation NGOs; research institutions and academic community for the implementation of research agenda and conservation education and awareness components of the protected area management plan; developing private-public partnership to generate funds that may include resources for habitat restoration and ecotourism development.

Entrance fee to tourist entering in SIPLAS both locals and foreigners will be collected. Entrance fees will be implemented in the identified strategic locations entering SIPLAS such as seaports and airports. To date, entrance fee for IPAF collection has not yet been implemented in SIPLAS.

Further, there are eleven (11) MOA holders subject for SAPA conversion utilizing SIPLAS area of approximately 52.6468 hectares that has been paying the annual development fee.

a) Proposed Revenue Generating Schemes from the Project

This refers to the projects such as ecotourism developments and livelihoods that are notably income generating in SIPLAS. Ecotourism projects which generated income will allocate certain proceeds to the host community and to the PAMB which they can be both utilized for the actual operation, development and conservation efforts of the destination as well as the protected area. Particularly, SIPLAS PAMB LGU/ potential partners sharing scheme on the collection of the entrance fee will contribute on the revenue generating schemes.

Likewise, collection of other fees and penalties will also contribute to revenue generation. Based on fees collected, the PAMO SIPLAS collection averaged to Php 800,000.00 to Php 900,000.00 annually.

Ecosystem services valuation and natural capital accounting will provide long term economic policies and economic incentives that enable sustainable management of SIPLAS natural resources.

Payment for Environmental Services (PES) by water concessioners to the land owners and SIPLAS PAMB to improve biodiversity management, conservation and protection actions in the area. PES could be of a variety of arrangements wherein the water concessioners would compensate the land owners and SIPLAS PAMB through an actual monetary payments or provision of livelihoods.

The implementation of SAPA is one of the revenue generating schemes in SIPLAS. There are several projects that are implemented in the national park which are potential sources of revenue upon entering SAPA with potential proponents. To date, there are ten (10) MOA's issued which are bound for conversion to SAPA.

Further, as provided in RA 11038, tourism developments in protected areas has to pass through the approval of the PAMB and that no actual implementation of such activities shall be allowed without it. PAMO SIPLAS has been collecting fines and penalties from tourism developments such as resorts, restaurants, hotels and etc. that has started/finished their construction without PAMB clearance. Collections were deposited to the SIPLAS IPAF RIA.

b) Revenue Projections

Based on Table 92, the revenue projection for SIPLAS 10-years implementation plan is Php 26,612,500.00 million. The revenues projected are made up of PES, Conservation Fee, Resource Use Fees, Development Fees, Concession Fee, Entrance Fee, Permits, and Fines and Penalties. The highest projected revenue source is from Resource Use Fees followed by PES and Entrance Fee.

Section 4 of DAO 2016-24 also known as the 'Revise Rates of Fees for Entrance and Use of Facilities and Resource in Protected Areas amending DAO 1993-47', for protected area, entrance fees, collected revenues shall cover, as much as possible, a proportionate amount of all costs incurred in protecting, maintaining and enhancing the natural attractions of the protected area.

The entrance fees shall cover sight-seeing in designated visitor areas; professional filming and photography; trekking, biking, mountain climbing, caving and similar activities; scuba diving, whitewater rafting, non-motorized water sports and similar activities; and use of the common facilities, i.e. comfort room, visitor center, view deck, etc, where available. The collection fees shall cover, as much as possible, a proportionate amount of all cost incurred in building and maintaining the man-made facilities in protected area.

Further, Annex C (1) of DAO 2018-05 known as 'Addendum to DAO 2007-17 on the rules and regulations governing special uses within protected areas' stipulated that development fee shall also be paid by the proponent upon approval of the Special-use Agreement in Protected Area (SAPA) by the DENR Secretary and annually thereafter by depositing the amount to the IPAF. The fees shall be equivalent to five percent (5%) of the most recent zonal value of the commercial zone in the nearest barangay or municipality where the project area is located multiplied by the size of the area for development and one percent (1%) of the value of improvement as premium to the protected area.

An Administrative Fee in the amount of Php 5,000.00 shall be paid by the proponent for every SAPA application filed to cover the cost of examining, assessing, and processing the requirements submitted by the proponent relative to the application for a special use agreement in a specific protected area. The Administrative Fee shall be collected by the DENR and deposited to the IPAF.

Rule 25.5 of DAO 2019-05 stated that for water supply and renewable energy projects of national significance, the proponent shall be subjected to a one-time payment of Development Fee as computed above and an Annual Fee equivalent to Php 7,200.00 per hectare, or a fraction thereof, and to be increased cumulatively by 10% every year.

c) User Fees

Rule 18 of DAO 2008-26 mandated to establish a trust fund known as Integrated Protected Area Fund (IPAF) for the purpose of financing projects of the NIPAS. The disbursement of IPAF shall be made solely for protection, maintenance, administration, and management of the protected area and duly approved projects endorsed by the PAMBs, in the amounts authorized by DENR.

SIPLAS IPAF sources are the following:

- ✓ Fees from the permitted sale and export of flora and fauna and other sources derived from the protected areas;
- ✓ Proceeds from lease of multiple-use zones;
- ✓ Contributions from industries and facilities directly benefiting from the protected area; and
- ✓ Such other fees and incomes derived from the operation of the protected area.

Potential protected area user fees:

- Protected Area Entrance Fee – is a fee paid to enter a protected area;
- Facilities User Fee – is a fee paid for the privilege of using man-made facilities inside a protected area;
- Recreational Fee – is a fee paid for recreational activities, e.g., swimming, snorkeling;
- Resource User Fee – is a fee paid for the sustainable commercial use of a specified quantity of resources within protected area over a specified period of time. Use of a protected area involves extraction of resources, e.g., water for irrigation and domestic water uses.
- Development Fee – is a fee for the use of land or other resources for the privilege of undertaking small, medium and other bigger scale development. Use and development of land, water and ecosystem resources and facilities within the MUZ.
- Concession Fee – is a fee paid for the use of land or other resources for the privilege of undertaking micro and cottage-scale development for a specified period of time and for a specified nature of development. micro and cottage-scale development, i.e., any economic activity which requires an investment of P150,000 and below.
- Royal Fee – is a fee paid based on the gross output value or gross sales from products out of resources derived from a protected area. When protected area use involves resource use extraction, e.g., rattan, bamboo and nipa.

d) Enterprise Building

Enterprise building refers to the construction of enterprise related structures within the protected area managed by the PAMB. SIPLAS PAMB had established eight protected area facilities that are maintained and monitored quarterly as presented in Table 97.

Table 97. Identified eight (8) Protected Areas facilities subject for maintenance

Name of Facilities	Location
PASu Dormitory	Sitio Dinakpan, Brgy. Del Carmen, Del Carmen, SDN
PASu Office Del Carmen	
PASu Office Dapa	Brgy. 12, Dapa, SDN
SIPLAS Tourism Assistance Office	Brgy. Del Carmen, Del Carmen, SDN
Del Carmen Look-out Tower	
Tagbuyakhaw Ranger Station	Brgy. Caub, Del Carmen, SDN
Paghungawan Marsh Monitoring Station I	Brgy. Jaboy, Pilar, SDN
Paghungawan Marsh Monitoring Station II	Brgy. Jaboy, Pilar, SDN

Utilization of these protected area facilities and collected fees on its use will contribute on the revenue generation of SIPLAS. Additional facilities maybe established such as food stalls, exhibits, souvenir shops and the like will be usefull especially during seasonal festivals, celebrations and other gatherings wherein appropriate collection of rental fees with the approval of the PAMB, will be added to the SIPLAS IPAF revenue.

e) Damage Fees: Land Rehabilitation Charges and Damage Fines

Provided on Section 20 of DAO 2019-05 known as 'Implementing Rules and Regulation of RA 11038 (ENIPAS)' acts such as disturbing and hunting or collecting of any wildlife, cutting timber without necessary permit, transporting any forest products or wildlife, constructing any business enterprise without prior clearance from the PAMB, constructing any permanent structure within forty (40) meter easement, undertaking mineral exploration or extraction, and similar activities are prohibited within the protected areas.

Section 21 of DAO 2019-05 provides penalties for violations under this act from fines to imprisonment. Section 21 (d) emphasized that for every continuing violation, or if the violation continues to be committed for thirty (30) days and upon reaching a total fine of Php 500,000.00, the PAMB through the PASu and other deputized government entities, shall cause the cessation of operation and either forfeit in favor of the PAMO or demolish the facility at the cost of its owner. If the facility is government-owned, the agency in-charge shall submit a plan for a substitute facility that complies with the protected area standards and, within one (1) year, execute the approved protected area management plan.

Further, Administrative fines of not less than Php 50,000.00, but nor exceeding Php 5 million, shall be imposed by the DENR Secretary for the violation of any rule, regulation, or provision of any agreement reached within the PAMB: Provided, that if an area which has sustained damage from any activity conducted therein requires rehabilitation or restoration,

the offender shall be required to restore or pay compensation for such damages, which payment shall accrue to the IPAF.

The penalties specified in Section 21 of DAO 2019-05 shall be in addition to the penalties provided in RA 9072 or the 'National Caves and Cave Resources Management and Protection Act', RA 9147 or the 'Wildlife Resources Conservation and Protection Act', RA 8550 or the 'Philippine Fisheries Code of 1998' and other related laws.

For the SAPA, Rule 25.7 of DAO 2019-05 specified that failure to pay the Development Fee will result to the following:

- ✦ Failure to pay on or before the due date shall be subject to monthly surcharge of 8.33% of the annual Development Fee.
- ✦ Failure to pay for at least one (1) year shall be subject to surcharges of 100% of the annual Development Fee for every year of non-payment, provided that, a fraction of a year beyond one (1) year shall be counted as a full year. Such non-payment shall also cause the suspension of the SAPA, and the SAPA holder's receipt of revenue-sharing allocation proceeds, if applicable.
- ✦ Failure to pay the annual Development Fee for two (2) consecutive years shall be a ground for cancellation of the SAPA.

X. 10-YEAR SIPLAS MANAGEMENT PLAN IMPLEMENTATION

10.1 Implementation Schedule

The proposed implementation schedule for SIPLAS' 10 Year plan is shown in Table 97. In order to ensure the institutionalization of the plan, said shall be presented to all the nine (9) Local Government Units (LGUs) of SIPLAS for adoption as part of the commitment of the LGUs.

The implementation plan indicate the resources needed, budget requirement, source of fund and the implementation institution in order to meet expected output of the management strategies. The first three (3) years of implementation will be devoted to implementation phase such as management zone delineation, biodiversity study (to update previous data), establishment and training of Bantay Gubat and Bantay Dagat teams, classification and organization of upland settlers (in the MUZ), identification and demarcation of water production and production forestry areas, and mobilization of PAMB members on the project. Site development operations, on the other hand, such as actual regeneration projects, habitat preservation and restoration, agroforestry development, mangrove protection, fuel wood cultivation development, and eco-tourism site planning, are scheduled to begin in the fourth to eight years. The PAMB is expected to prepare and approve management plans for essential ecosystems, agroforestry sites, eco-tourism locations, fuelwood plantations, marine conservation areas, and other areas for restoration and development between preparatory activities and actual site development.

An annual Work and Financial Plan (WFP) shall be prepared by the PASu based on the implementation plan following the annual national government budgetary cycle and its corresponding guidelines including the utilization of the IPAF-RIA. The WFP serve as guidance on the implementation of programs and projects within SIPLAS. Furthermore, the WFP should be endorsed by the PAMB-SIPLAS and submitted to the DENR XIII Regional Office for approval.

The PASu as the Chief Operating Officer in SIPLAS shall be accountable for the effective implementation of these plans with the guidance of the Regional Executive Director together with the PAMB. The DENR CARAGA Regional Office shall likewise that the timely technical and financial assistance are provided to support the implementation of the management plan. The DENR through the CDD and BMB shall provide overall guidance and technical assistance in the implementation of the management plan.

PASu Office is also required to review the progress and outcomes of plan implementation during the execution period and make any relevant changes to the plan, as well as begin work on the project plan for the next five years.

Table 98. Schedule of activities for implementation of the 10 Year Management Plan of SIPLAS

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
Terrestrial Management						
1. Biodiversity protection and conservation						
a) Demarcation of management zones (Strict Protection Zones and Watershed Conservation Areas)						
*Community consultations	Report on the Consultation Meeting conducted with Attendance and Photo documentations	Year 1 to Year 2	*Logistics: LCD, DSLR Camera Laptop/computer, Bond papers, printer, ink *Catering and venue (meeting)	Php 3,255	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; NGO Funds; Private sector sponsor/donations	DENR, PLGU, MLGU, NGO, Private Sector
*Ground demarcation	CSW/Report with recommendations and photo documentation and maps with technical descriptions	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses			
*Updating of SIPLAS and LGU/barangay maps, plans and ordinances to reflect established boundaries	Report on the Demarcation with Approved Map and the following: -Copy of updated SIPLAS maps -Photo documentation		*Logistics: Bond papers, printer, ink,laptop/computer, Cellphone for geotag pictures			
b) Biodiversity research and documentation (develop research framework and protocols, execute agreements, conduct research, develop database)						
*Linkaging with academic and research institutions for any recent studies undertaken or for any interest to undertake biodiversity studies in SIPLAS.	Report on the Coordination Meeting with the Academe	Year 1 to Year 5	*Logistics: LCD, DSLR Camera Laptop/computer, Bond papers, printer, ink *Catering and venue (meeting)	Php 4,300		DENR, PLGU,MLGU, Academe, DOST, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
* Conduct research studies in SIPLAS by Undergraduate students and funded by SIPLAS PAMB.	* No. of proposed research studies accepted and approved by the PAMB *Report on the no. of approved PAMB Resolutions with copy of research studies from the researcher	Year 2 to Year 10			DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF, Research Projects, Private Sector Donations/Sponsors	DENR, PLGU, MLGU, Academe, DOST, Private Sectors
*Agreement between researchers and SIPLAS-PAMB to present their final results and copy furnish before leaving SIPLAS.	*Agreement signed between researchers and PAMB to present their initial results before leaving SIPLAS. * Report of the research study submitted to the PAMB	Year 2 to Year 6	*Logistics: LCD, DSLR Camera Laptop/computer, Bond papers, printer, ink *Catering and venue (meeting)			DENR, PLGU, MLGU, Academe, DOST, Private Sectors
*SPZ which contains rich biodiversity resources will be prioritized as study areas.	* Approved PAMB Resolutions endorsing the SPZ areas to be prioritized for the study area	Year 1 to Year 6				
*Implementation of additional Biodiversity Assessment Monitoring System (BAMS) Site	* Full Site Assessment Report on the selected BAMS Site conducted by the academe	Year 1 to Year 2, Year 6 and Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses			DENR, PLGU, MLGU, Academe, DOST, Private Sectors
* Develop protocols for collaborative researches in SIPLAS.	*Report on the coordination meeting conducted by the academe to the PAMO-SIPLAS	Year 1 to Year 5	*Logistics: LCD, DSLR Camera Laptop/computer, Bond papers, printer, ink			DENR, PLGU, MLGU, Academe, DOST, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
	* Develop protocols for the researches to be conducted in SIPLAS approved and endorsed by the PAMB		*Catering and venue (meeting)			
*Enhancement of Arboretum in SIPLAS.	Report/Plan in enhancement of arboretum which includes the following: 1.Name of species to be planted 2. Photo documentation 3. Area development plan	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses			DENR, PLGU, MLGU, Academe, DOST, Private Sectors
c) Habitat restoration and rehabilitation						
* Identification and mapping of sites for restoration/rehab; planning and fund sourcing (e.g., NGP)	Report on the conducted assessment/survey	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 4,000	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF, Private Sector donations/sponsors	DENR, PLGU, MLGU, Academe, Private Sectors
* Actual restoration/rehabilitation	-Report on the conducted rehabilitation and restoration with photo documentations	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 10,000		DENR, PLGU, MLGU, Academe, Private Sectors
* Maintenance and enhancement of NGP plantation	-Report on maintenance and enhancement of NGP plantation with photo documentation	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures,	P 18,370		DENR, PLGU, MLGU, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
			motorbike/van/pick-up truck, gasoline/diesel *Travel expenses			
*Enhancement of existing seed production area for SIPLAS	Report on the list of existing seedling productions managed by PO including the no. of existing seedlings, name of the species produce	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Procurement of seedling materials (polyethylene bags, sticks, etc.) *Seedlings *Travel expenses	P 21,780		DENR, ERDB, PLGU, MLGU, Academe, Private Sectors
*Operationalization/Maintenance of SPA	Report on the list of existing seedling productions managed by PO including the no. of existing seedlings, name of the species produce	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Procurement of seedling materials (polyethylene bags, sticks, etc.) *Travel expenses	P 3,000		DENR, ERDB, PLGU, MLGU
*Nursery establishment of indigenous species per LGU and DENR-SIPLAS will capacitate the LGU in managing it	*Report on the coordination meeting with LGU and DA *Agreement between LGU and DENR on the Nursery establishment through MOA	Year 1 to Year 7	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel	P 2,000		DENR, ERDB, PLGU, MLGU, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
			*Procurement of seedling materials (polyethylene bags, sticks, etc.) *Travel expenses			
*Closely coordinate with tertiary schools with regards to mandatory tree planting of their graduates	*Agreement between PAMB-SIPLAS and tertiary schools with regards on mandatory tree planting of their graduates through MOA * Report from the academe in the conduct of the tree planting activity including the location, total area and total of the trees planted of their graduates	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Procurement of seedling materials (polyethylene bags, sticks, etc.) *Travel expenses	P 2,000		DENR, Academe, Private Sectors
d.) Cave Conservation and Management						
*Update inventory of caves	*Report on the updated cave inventory in SIPLAS with maps	Year 1 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 300	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU
*Assess and classify cave	Report on the assessment and classification conducted	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Prepare and formulate 5-year cave management plan	*Report on the workshop/writeshop conducted * Crafted 5 Year Cave Mgt. Plan endorsed and approved by the PAMB through PAMB Resolution	Year 1 to Year 10	*Logistics: LCD, DSLR Camera Laptop/computer, Bond papers, printer, ink * Catering and venue (meeting)	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors
*Implement cave management plan (secure MOA and LGU and PAMB Resolutions)	* MOA signed by PAMB Chairman and LGUs *Report on the activities conducted in the formulation of cave management plan	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors
*Update/Formulate cave management plan	*Report in the conduct of updating of cave management plan workshop/writeshop *Updated/formulated Cave Mgt. Plan endorsed and adopted by the PAMB through PAMB Resolution	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors
*Conduct monitoring and evaluation of cave management	*Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Provision of Group Insurance for Cave Management Focal Persons	* Group insurance acquired (no.)	Year 1 to Year 10	*Travel expenses	P 200	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors
e.) Wetland Conservation and Management						
*Update inventory of wetland	*Report on the updated wetland inventory in SIPLAS	Year 1 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU
*Assess and classify wetland	Report on the full site assessment and classification with map	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors
*Update/Prepare and formulate 5-year wetland management plan	*Report on the wetland mgt. workshop/writeshop conducted * Crafted 5 Year Wetland Mgt. Plan endorsed and adopted by the PAMB through PAMB Resolution	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Implement wetland management plan (secure MOA and LGU and PAMB Resolutions)	* MOA signed by PAMB Chairman and LGUs *Report on the activities conducted in the formulation of wetland management plan	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors
*Conduct monitoring and evaluation	*Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors
*Update wetland management plan	*Report in the conduct of updating of cave management plan workshop/writeshop *Updated Cave Mgt. Plan endorsed and adopted by the PAMB through PAMB Resolution	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Private Sectors
f) Wildlife Conservation and Management						
*Inventory of wildlife sighting areas/ nesting sites	* Report on the inventory of sighting areas with map	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Research Projects;	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
					Private Sector donations/sponsors	
*Conduct wildlife habitats/nesting sites assessment	*Report on the conduct of habitat full site assessment with the map	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 2,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Research Projects; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Establish nesting sites/ wildlife habitat Sanctuary	* Barangay Resolution and Municipal Resolution on the establishment of the nesting sites/ wildlife habitat Sanctuary * PAMB Resolution adopting the establishment of the nesting sites/ wildlife habitat Sanctuary	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Research Projects; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Conduct inter-agency joint patrol and surveillance thru LAWIN patrol	*Report on the conduct of patrolling and surveillance with findings and recommendations from patrollers with the following attachments: *Copy of the Approved Regional Special Order for the Creation of the patrolling/surveillance team.	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, PNP, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Conduct Communication, Education and Public Awareness (CEPA)	*Report on the CEPA conducted in LGUs/Barangays	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses *Catering and venue (meeting)	P 200	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Conduct monitoring and evaluation	*Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 200	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIKAT Inc., SIBOL, Academe, Private Sectors
*Compliance monitoring of permit holders (Wildlife Registration and Wildlife Farm Permit)	* List of permit holders (Wildlife Registration and Wildlife Farm Permit)	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 200	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Operation and Mobilization of Wildlife Traffic Monitoring Units	*Report on the monthly Operation and Mobilization of Wildlife Traffic Monitoring	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Mobilization of WEO with quarterly report including biodiversity related cases acted	* Submission of WEO monthly report on the including biodiversity related cases acted	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 200	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
g) Biodiversity Monitoring System (BMS) in four (4) terrestrial sites						
*Conduct Biodiversity Monitoring System in four (4) terrestrial sites	* BMS Report including the identified threats submitted and presented to PAMB * PAMB Resolution endorsing the BMS report with recommendation * Actions taken in support to the recommendation given by the PAMB	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, DSLR camera, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 2,500	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	DENR, PLGU, MLGU, SIKAT Inc, SIBOL, Private Sectors
h) Biodiversity Assessment and Monitoring Site (BAMS) Terrestrial						
Establishment and monitoring of BAMS Site	*BAMS site established *BAMS report *PAMB Resolution endorsing BAMS report	Year 2 and Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, DSLR camera, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses *Catering	P 1,300	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	DENR, PLGU, MLGU, SIKAT Inc, SIBOL, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
i) Community-based resource protection						
*Delineation and demarcation of designated forest protection area	* Report on the Delineation and demarcation of designated forest protection area with maps	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 4,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Deputation of the DENRO (Deputized Environment and Natural Resources Officer)	* List of the Deputized Environment and Natural Resources Officer endorsed by the PAMB	Year 1 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and venue (meeting)	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Capability Trainings on Forest Protection and Rehabilitation	* Report on the Capability Trainings related to the Forest Protection and Rehabilitation	Year 1 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Capacitate protected area communities especially PACBRMA holders	* Capacity trainings and workshops conducted in support to the implementation of the 5 Yr CRMP	Year 3 to Year 7	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and venue (meeting)	P 1,500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Monitoring and Evaluation of PACBRMAs	*Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
j) Conservation of water production areas						
*Identification and assessment of current and potential sources of water for domestic use and irrigation	* Report on the full site assessment to the potential sources of water for domestic use and irrigation area with maps	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 100	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Ground demarcation of identified water source	* Report on the Delineation and demarcation of identified water source with maps and technical descriptions	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 175	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Identification of resource managers, negotiation and signing of agreements with PAMB; application of permits with NWRB	*Number of Memorandum of Agreement with PAMB and resource managers * Database on the list of applicants applied in the NWRB *Number of permits given by the NWRB	Year 2 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 200	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, NWRB, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Participatory preparation/ upadating of watershed management plans through workshop/writeshop and other related training	*Report on the conduct on formulation/ updating of watershed management plan * Crafted 5 Year Watershed Mgt. Plan endorsed and adopted by the PAMB through PAMB Resolution	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Management and rehabilitation by designated resource manager	* MOA signed by the PAMB Chairman and resource managers *Report on the conduct of rehabilitation and management in support to the 5 Yr Action Plan	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
k) Strengthening of Enforcement (Patrolling and Surveillance)						
*Bantay-Gubat formation/ capacity building and deputation	*Report on the conduct of capacity building and deputation trainings	Year 2 to Year 8	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and venue (workshop)	P 3,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, PNP, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Regular patrol and surveillance; documentation and reporting of violations through LAWIN	*Report on the conduct of regular patrolling and surveillance with documentation and reporting of violations and following report attachments: - Copy of the Approved Regional Special Order for the Creation of the patrolling/surveillance team.	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 5,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, PNP, Academe, Private Sectors
*Apprehension of undocumented forest products including NTFPs, vehicles, equipment and other implements thru proper channel	* Report on apprehension of the undocumented forest products including NTFPs, vehicles, equipment and other implements	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses	P 1,000	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	DENR, PLGU, MLGU, DILG, SIKAT Inc, SIBOL, Private Sectors
*Hauling of apprehended forest products and vehicles	* Hauling of apprehended forest products and vehicles	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	DENR
*Immediate administrative and adjudication proceedings for apprehended forest products including conveyances, tools and implements	* Proceedings for apprehended forest products including conveyances, tools and implements were documented	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	DENR, DILG

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Inventory of apprehended/confiscated forest products	* Report on the documented inventory of apprehended/confiscated forest products	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	DENR
*Support to investigation, filing and prosecution of criminal complaints	* Report on the investigation * Affidavit on the filing and prosecution of criminal complaints	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 2,000	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	DENR, NGO (SIBOL)
* Internet subscription for field offices and AILTF checkpoints	* Procured gadget and other telecommunication devices given to the AILTF field personnel *Logistics for internet (load cards) procured and given to the AILTF field personnel	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, internet load cards	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Private Sector donations/sponsors	DENR
SIALEC Operationalization	*Report on SIALEC Operationalization	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, PNP, Academe, Private Sectors
*Establishment, operation and maintenance of check points	*Report on the maintenance of existing checkpoints/guard house	Year 1 to Year 10	* Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures,	P 3,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU	DENR, PLGU, MLGU, PO, SIBOL, PNP,

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
			motorbike/van/pick-up truck, gasoline/diesel *Infrastructure Materials: port cement, corrugated rooftop, steel, etc.)		IRA;MLGU IRA; Private Sector donations/sponsors	Academe, Private Sectors
*Establishment of guard house	* Submitted report on the constructed guardhouse to the identified areas * Report on the maintenance of the facilities	Year 2 to Year 5	* Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Infrastructure Materials: port cement, corrugated rooftop, steel, etc.)	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, PNP, Academe, Private Sectors
*Conduct of CEPA related on environmental laws and policies	* Report on the conduct CEPA to the identified barangays quarterly	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and venue (meeting)	P 5,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, PNP, Academe, Private Sectors
*Appropriation/allocation of budget for the honorarium/ monetary incentives of deputized Bantay Gubats	* PAMB Resolution on the approved WFP for the honorarium/monetary incentives of deputized Bantay Gubats	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van/ pick-up truck, gasoline/ diesel *Travel expenses *Hiring of Bantay Gubats * Catering and venue (meeting)	P 24,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, PNP, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
2. Socio-economic development programs						
a. Provision of land tenure security						
*Updating of SRPAO (Survey and Registration of Protected Area Occupants)	*SRPAO Report on the conduct of inventory of land claims and development in forestland with maps and technical description	Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses *Hiring of Enumerators	P 2,520	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	SIPLAS PAMO, PLGU, MLGU
*Delineation of land claims in forestlands MUZ	*Delineated of land claimants within MUZ forestlands with maps and technical description	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, Academe, Private Sectors
*Organization of eligible claimants into POs	*Organized People's Organizations registered in Security Exchange Commission (SEC)	Year 3 to Year 8	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and venue (meeting)	P 1,500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, PO, SIBOL, Academe, Private Sectors
*Processing of appropriate tenure instrument (i.e PACBRMA/SAPA,MOA)	* Approved PACBRMA/SAPA/MOA endorsed and adopted by the PAMB *Database on the list of tenurial instrument	Year 2 to Year 9	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 800	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Preparation of management plan for tenured areas	* Report on the Community Based Mgt. Plan Workshop/ Writeshop to the PACBRMA holders * Crafted 5 Yr CRMP endorsed and approved by the PAMB	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (workshop)	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU
*Conduct Monitoring and evaluation of PACBRMA implementation	*M&E Report	Year 5 and Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU
b) Agroforestry farm development						
*Identification and assessment of current and potential sources of water for domestic use and irrigation	*Report on the identified and assessed of current and potential sources of water for domestic use and irrigation with maps	Year 2 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Delineation of agroforestry farms;	*Report on the conduct of delineation of agroforestry with maps and technical description	Year 1 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses	P 900	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Trainings on SWC and farm planning	Report on the conduct of SWC and farm planning trainings	Year 2 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (workshop)	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Farm development and maintenance	*Report on the conduct of farm development plan and maintenance formulated with maps and technical description *Report on the implementation of Sloping Agricultural Land Technology (SALT)	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 5,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Production/procurement of planting material	*List of planting materials to be procured *No. of seedlings planted	Year 1 to Year 9	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Procurement of seedling materials (polyethylene bags, sticks, etc.) *Seedlings *Travel expenses	P 10,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Conduct soil sampling and analysis	*Report on the conduct of soil sampling and analysis	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses *Soil sampling	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Implement Sloping Agricultural Land Technology (SALT)	* Report on the implementation of Sloping Agricultural Land Technology (SALT)	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 8,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
c) Fuelwood plantation and woodlots development						
*Validation of areas; identification of farmer beneficiaries	*Report on the conduct of validation with maps and technical descriptions	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 400	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Preparation of farm plans; identification of funding sources	<ul style="list-style-type: none"> *Database of the farmer beneficiaries *Report on the conduct of farm planning workshop/writeshop * Private sectors identified for funding source 	Year 2 to Year 3	<ul style="list-style-type: none"> *Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting) 	P 200	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Establishment of plantations (with technical assistance in sourcing planting materials)	<ul style="list-style-type: none"> *Report on the findings of established plantations with maps and technical descriptions *Report on the consultation meeting with LGU for identification of selective cuttings per municipality *Database of issuance of permits, PAMB Resolutions and tenurial instruments 	Year 4 to Year 5	<ul style="list-style-type: none"> *Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses 	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Monitoring and evaluation of Fuelwood Plantation and woodlots development	*Monitoring Report	Year 5 to Year 10	<ul style="list-style-type: none"> *Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses 	P 600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
d) Development and Implementation of Biodiversity Friendly Enterprise (BDFE) and other livelihood activities						
*Identification and conduct feasibility assessment of potential community enterprises; identification of potential funding sources	*Report on the conduct feasibility assessment with findings * Potential partners for sponsorship of the community livelihood	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 400	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Organization and strengthening of People's Organization (PO); training on enterprise and financial management	*Report on the updated list of POs in SIPLAS	Year 2 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (workshop)	P 600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Preparation of business plans; assistance in initial operations; link with markets and support facilities	*Report on the conduct of trainings (business plans) * Identified potential partners in link with markets and support facilities (DOLE,DTI)	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (workshop)	P 500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*DENR and LGU shall seek funds for livelihood and tap other agencies such as DOLE, DA, etc.	* Approved Business Plan Proposal to be submitted to DA and DOLE for budget allocation	Year 2 to Year 9	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, *Travel expenses	P 400	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Implementation of the BDFE and other livelihoods	* Approved MOA for BDFE to the identified recipients	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck * BDFE or livelihood materials	P 10,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
* Implement Women Related livelihood projects	* Report on the implementation of BDFE and other livelihood activities	Year 9 to Year 10	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van/ pick-up truck * BDFE or livelihood materials		DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, SIKAT Inc., Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
Coastal and Marine Resources Management						
1. Delineation of SIPLAS Boundary and Management Zone based on the DAO 2019-05 updated Technical Description	No. of kilometers	Year 2 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat/speedboat, gasoline/diesel, mooring buoys, rope, port cement *Travel expenses	6,500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, Academe, Private Sectors
2. Coastal habitat and species conservation						
a) Identification of wildlife nesting sites and demarcation of its management zones						
*Conduct inventory to the Identified wildlife nesting sites	*Report on the inventory of sighting areas with map	Year 1 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat/speedboat, gasoline/diesel *Travel expenses	P 600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, Academe, Private Sectors
*Conduct community consultations	* Report on the community consultations regarding on the identification of wildlife nesting sites in their area	Year 1 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering (meeting)	P 600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NOG Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc, RARE, SIBOL, Academe, Private Sectors
* Fund sourcing	* Approved WFP with the allocated budget	Year 1 to Year 10				

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
* Demarcation of areas	* Report on the Delineation and demarcation of identified nesting sites with maps and technical descriptions	Year 2 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat/speedboat, gasoline/diesel, mooring buoys, rope, port cement *Travel expenses	P 500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, Academe, Private Sectors
* Updating of SIPLAS and LGU/barangay maps, plans, ordinances to reflect established boundaries		Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat/speedboat, gasoline/diesel *Travel expenses	P 200	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, Academe, Private Sectors
*Implementation of Biodiversity Assessment Monitoring System (BAMS) for marine	* Full Site Assessment Report on the selected BAMS Site conducted by the academe	Year 1 to Year 2, Year 6 and Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat/speedboat, gasoline/diesel, mooring buoys, rope, port cement *Travel expenses	P 3,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Research Projects; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Conduct monitoring and evaluation	*Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	Year 2 to Year 7	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat/speedboat, gasoline/diesel *Travel expenses	P 600	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
b) Management of Marine Protected Areas						
* Validation of location and areas of individual MPAs	*Report on the validation conducted with maps and technical description * Municipal Ordinance in the established MPAs	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat/speedboat, gasoline/diesel, mooring buoys, rope, port cement *Travel expenses	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; BFAR GAA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Private Sectors
*Participatory preparation/ updating of individual MPA management plans; legitimization and approval by PAMB	*Report on the conducted of management plan * Crafted 5 Yr MPA Mgt. Plan endorsed and approved by the PAMB	Year 1 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/diesel *Travel expenses *Catering and venue (meeting)	P 900	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; BFAR GAA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Private Sectors
*Protection and management of individual MPAs to designated MPA managers	* Marine Habitat Assessment conducted *Report on the marine habitat assessment and monitoring *MPA Patrolling Report	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel, SCUBA Gears *Travel expenses	P 15,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; BFAR GAA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
*Demarcate and re-install boundary bouys	*Report on the turned-over of bouys with the following attachments: -Notice of Awards -Deed of Donations	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 2,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; BFAR GAA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Review/updating of initial MPA Network Action Agreement and Plan	* Approved MPA Network Action Plan endorsed by the PAMB * MOA signed by the stakeholders regarding on the implementation of the MPAN	Year 1 to year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; BFAR GAA; NGO Funds; Research Projects; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PNP-MARITIME, PCG, PO, Academe, Private Sectors
*Conduct of joint activities: CEPA, enforcement and M and E	*Reports on CEPA, enforcement and M and E activities conducted with the stakeholders	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 3,500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; BFAR GAA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PNP-MARITIME, PCG, PO, Academe, Private Sectors
*Periodic MPA Network Forum and MPA effectiveness assessment (MEAT and NEAT)	*Report on the conduct of MPA Network Forum and MPA effectiveness assessment (MEAT and NEAT) *Report on the accomplishment of the MPA	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PNP-MARITIME, PCG, PO, Academe, Private Sectors
*Monitoring and Evaluation of the MPA Management Plan	*Report on the accomplishment of the MPAs	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel, SCUBA Gears *Travel expenses	P 10,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PNP-MARITIME, PCG, PO, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
c) Seagrass Monitoring						
*Seagrass Assessment Habitat Focus	*Report on the conduct of seagrass monitoring with map	Year 3, Year 6 and Year 9	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel, SCUBA Gears *Travel expenses *Catering	P 900	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Research Projects; NGO Funds; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL Incorporated, Academe, Private Sectors
*Seagrass Assessment and Monitoring threat focus	*Report on the conduct of seagrass monitoring with map	Year 1, 2,4,5,7,8 and year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel, SCUBA Gears *Travel expenses *Catering	P 1,750	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Research Projects; NGO Funds; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL Incorporated, Academe, Private Sectors
d) Coral Rehabilitation						
*Identification and assessment of suitable sites	*Report on the conduct of identification of suitable sites for coral rehabilitation with map	Year 2 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel, SCUBA Gears *Travel expenses	P 300	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Research Projects; NGO Funds; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
*Consultation with coral rehab experts; preparation of coral rehab plan and budget; source funding	*Report on the conduct of consultations meetings with Coral rehab experts	Year 2 to Year 4	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/var, gasoline/diesel *Travel expenses *Catering and venue (meeting)	P 300	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Rehabilitation, protection and maintenance (with necessary training)	*Report on the conduct of rehabilitation and maintenance to the ARs (monitoring, assessment)	Year 3 to Year 8	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel, SCUBA Gears *Travel expenses	P 600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Research Projects; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
*Install ARs (using indigenous materials)	*Contract of Service in the construction of ARs *Contract of Service in the installation of the ARs to the selected sites *Report in the construction of ARs and installation *Database of ARs status, location and map	Year 3 to Year 8	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel, SCUBA Gears *Materials for ARs: port cement, bamboo stick, coconut lumbars, etc. *Travel expenses	P 1,800	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
Conduct monitoring and Fish Visual Census (FVC) with focus on threats	*Report on the conduct of coral reef monitoring and Fish Visual census (FVC) with focus on threats *PAMB resolution on the adoption of the technical report	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel, SCUBA Gears *Travel expenses	P 1,500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
e) Mangrove protection and rehabilitation						
*Identification of areas for enhancement	*Report on the conduct of identification of suitable sites for mangrove enhancement with map	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, underwater camera, pumpboat/ speedboat, gasoline/diesel *Travel expenses	P 500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
*Establishment and maintenance of nurseries for seedling production	* Report on the established and maintenance of the nurseries	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat, gasoline/diesel *Travel expenses	P 900	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
*Implement Adopt NGP Programs	*Report on the implementation of adopt NGP Programs with maps and technical descriptions * Approved MOA signed between DENR and recipient POs	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat/ speedboat, gasoline/diesel *Materials for seedlings: polyethylene bags, sticks, seedlings, etc. *Travel expenses	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
* Enhancement of mangrove reforestation under abandoned unlicensed fish ponds		Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat, gasoline/diesel *Materials for seedlings: polyethylene bags, sticks, seedlings, etc. *Travel expenses		DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Assessment / monitoring of mangrove area with focus on threat	*Report on the monitoring of mangrove area with focus on threat *Map	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat, gasoline/diesel *Travel expenses	P 1,500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
*Maintenance and Protection of enhanced mangrove area	*Report on the conduct of rehabilitation and maintenance of enhanced mangrove area	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat, gasoline/diesel *Materials for seedlings: polyethylene bags, sticks, seedlings, etc. *Travel expenses	P 2,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
*Mobilization of communities and partners/stakeholders for mangrove planting	*Report on the conduct of mangrove rehabilitation and maintenance	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat, gasoline/diesel *Materials for seedlings: polyethylene bags, sticks, seedlings, etc. *Travel expenses	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
*Mobilization of communities for maintenance and protection	* Total area on the mangrove areas planted with maps	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat, gasoline/diesel *Materials for seedlings: polyethylene bags, sticks, seedlings, etc. *Travel expenses	P 1,000	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Install signage and conduct CEPA	*Signage billboard installed to the identified public areas *Report on the conduct of CEPA and installation of signage	Year 3 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, pumpboat, gasoline/diesel *Billboard materials: Tarpaulin, steel bars, *Travel expenses	P 300	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, Private Sectors
Water quality monitoring in recreational, mouth of river, marine sanctuaries	* Report on the Water Quality Monitoring to the TREs	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses *Laboratory Expenses *Catering	P 10,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/sponsors	DENR, EMB, PLGU, MLGU, SIBOL, Academe, Private Sectors
Joint seaborne patrol	*Report on the conduct of seaborne patrol	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 3,000	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Academe research projects; Private Sector donations/ sponsors	DENR, EMB, PLGU, MLGU, SIBOL, Academe, Private Sectors
Technical assistance to LGU's on coastal and marine related concerns	*Report on the conduct of Technical Assistance to LGU's	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 5,000	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Academe research projects; Private Sector donations/ sponsors	DENR, EMB, PLGU, MLGU, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
Crafting of Water resource disaster response plan	* Water resource disaster response plan	Year 1	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 600	DENR GAA	DENR, EMB, PLGU, MLGU, SIBOL, Academe, Private Sectors
Implement Water resource disaster response plan (monitoring)	*Report on the conduct of public consultation and meetings in the development of response plan *Adoption of SIPLAS PAMB to the plan	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 5,400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Academe research projects; Private Sector donations/ sponsors	DENR, EMB, PLGU, MLGU, SIBOL, Academe, Private Sectors
f) Biodiversity Monitoring System (BMS) in four (4) marine sites						
*Conduct Biodiversity Monitoring System in four (4) marine sites	* BMS Report including the identified threats submitted and presented to PAMB * PAMB Resolution endorsing the BMS report with recommendation * Actions taken in support to the recommendation given by the PAMB	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, DSLR camera, mask and snorkel, Cellphone for geotag pictures, motorbike/ van/pick-up truck, pumpboats, gasoline/diesel *Travel expenses *Catering	P 1,250	DENR GAA; PLGU IRA; MLGU-IRA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF	DENR, PLGU, MLGU, SIKAT Inc, SIBOL, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
3. Fisheries management						
*Institutionalize and operationalized SIALEC	*Report on the institutionalization and operationalization of SIALEC	Year 1 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 300	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors
*Signing of inter-LGU Fisheries Enforcement MOA	* MOA signed by the partner stakeholders	Year 1 to Year 2	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 200	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors
*Reactivation/strengthening of municipal and barangay FARMCs	* List of FARMCs identified by the LGUs * Municipal Resolutions and PAMB Resolutions endorsing the FARMCs * WFP for the honorarium/allowance of the FAMRCs	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 400	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors
*Creation/strengthening of Bantay Dagat teams; enforcement training	*Report on the conduct in creating and training for bantay dagat (Deputization, para legal, SCUBA training) * Deputized of bantay dagats	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (workshops)	P 27,600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Enactment of unified fisheries ordinances	* Approved Unified Fisheries Ordinance signed by the LGUs * PAMB Resolution adopting the Unified Fisheries Ordinance	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and venue (meeting)	P 900	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors
*Enforcement of unified registration and licensing systems; open and closed seasons	*Database of the registered boats, gears per municipality	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses	P 500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors
*Wildlife Trafficking and Monitoring (WTM)	* Report on the Wildlife Trafficking and Monitoring	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 500	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors
* Inventory of unlicensed fish cages	* Inventory report on the List of unlicensed fish cages	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 200	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Technical Assistance Component	* Report on technical assistance to the LGUs (Assessments, monitoring, trainings and workshops)	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,600	DENR GAA; DENR FASPS; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, PO, Academe, PNP MARITIME, Private Sectors
4. Foreshore Management						
Inventory of existing uses and development in foreshore areas	*Report on the inventory of existing uses and development within foreshore areas *List of identified existing uses and development within foreshore areas with maps	Year 2 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 300	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, DILG, PLGU, MLGU, Private Sectors
Process appropriate permits and tenurial instruments (SAPA/MOA)	*No. of SAPA/MOA with the endorsement and approval of the PAMB * Database of the SAPA/MOA	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Private Sectors donations/sponsors	DENR, Private sectors
Conduct monitoring and evaluation on Foreshore areas	*Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 450	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, NGO

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
5. Easement Management						
Inventory of existing infrastructure and other development facilities	*Report on the conduct of inventory existing facilities and other development facilities	Year 1	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses	P 1,000	DENR GAA; DILG GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, DILG, PLGU, MLGU, Private Sectors
Demarcate easement	*Report on the conduct of demarcation and recovery of easement * No. of demarcation markers constructed and installed in the easement area	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Materials for demarcation: port cement, sand, steels, etc. *Travel expenses	P 4,000	DENR GAA; DILG GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, DILG, PLGU, MLGU, Private Sectors
Recover easement	*Report on the demolition of the infrastructures within the easement area with map	Year 1 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,350	DENR GAA; DILG GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, DILG, PLGU, MLGU, Private Sectors
Issuance of notice of violation	*No. of NOV letters delivered and received by the violators	Year 1 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 450	DENR GAA; DILG GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, DILG, PLGU, MLGU
Conduct monitoring and evaluation of easement areas	*Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses	P 1,500	DENR GAA; DILG GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; Private Sector donations/sponsors	DENR, DILG, PLGU, MLGU, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
6) Development and Implementation of Biodiversity Friendly Enterprise and other livelihood activities						
* Identify and conduct feasibility assessment of alternative livelihood activities and funding sources	*Report on the conduct feasibility assessment with findings	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/ diesel *Travel expenses	P 500	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., SIBOL, PO, DTI, Private Sectors
* Organize and strengthen of PO; Conduct training on enterprise and financial management	* List of the identified registered POs *Report on the conduct of trainings (business plans) * Crafted Business Plans approved and endorsed	Year 2 to Year 7	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van, gasoline/diesel *Travel expenses *Catering and venue (workshop)	P 1,200	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., SIBOL, PO, DTI, Private Sectors
* Assist in initial operations; link with markets and support facilities	* Identified potential partners in link with markets and support facilities (DOLE, DTI)	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/ diesel *Travel expenses	P 900	SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DTI Fund; DOLE Fund; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., SIBOL, PO, DTI, Private Sectors
*Implement BDFE and other livelihoods	* Approved MOA for BDFE to the identified recipients * Report on the implementation of BDFE and other livelihood activities	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/ diesel *Travel expenses *Procurement of BDFE paraphernalia	P 22,500	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DTI Fund; DOLE Fund; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., SIBOL, PO, DTI, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Implement community based ecotourism and related livelihood activities		Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses		DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DTI Fund; DOLE Fund; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., SIBOL, PO, DTI, Private Sectors
Cross Cutting Management						
1. Eco-tourism development						
*Review/update of SIPLAS Eco-tourism Management Plan	*Conduct workshop/writeshop on the updating EMP * Updated the 5 Year SIPLAS EMP	Year 2 to Year 3, Year 9 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 600	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DOT Fund; Private Sector donations/sponsors	DENR, DOT, PLGU, MLGU, PO, DTI, Private Sectors
*Review of current operations, physical development plan and marketing plans for current tourism sites; refinement of plans	*Report on the conduct of review with DOT and other tourism organization for responsible tourism	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 400	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DOT Fund; Private Sector donations/ sponsors	DENR, DOT, PLGU, MLGU, PO, DTI, Private Sectors
*Agreements with tourism operators and ecotourism site managers on biodiversity conservation and responsible tourism	* MOA signed between PAMB and tourism operators and ecotourism site managers on biodiversity conservation and responsible tourism	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van, gasoline/diesel *Travel expenses *Catering and venue (meeting)	P 200	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DOT Fund; Private Sector donations/sponsors	DENR, DOT, PLGU, MLGU, PO, DTI, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Coordination with DOT and other tourism organizations for promotion of responsible ecotourism	* MOA signed between PAMB, DOT and tourism operators and ecotourism site managers on promotion of responsible tourism	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 200	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DOT Fund; Private Sector donations/sponsors	DENR, DOT, PLGU, MLGU, PO, DTI, Private Sectors
*Review of Special Use Agreement for Protected Area (SAPA) with establishments along foreshore and timberland areas	* Approved SAPA endorsed by the PAMB	Year 2 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 300	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DOT Fund; Private Sector donations/sponsors	DENR, DOT, PLGU, MLGU, PO, DTI, Private Sectors
* Update the list of ecotourism sites	*Report/Database on list of updated eco-tourism sites	Year 1 to Year 2	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 200	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DOT Fund; Private Sector donations/ sponsors	DENR, DOT, PLGU, MLGU, PO, DTI, Private Sectors
* Review gamefishing regulations for sustainable fisheries	* PAMB Resolutions Imposed regulations for game fishing activities	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 100	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; DOT Fund; Private Sector donations/ sponsors	DENR, DOT, PLGU, MLGU, PO, DTI, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
* Review ecological impact of potential cruise ship operations	*Report on conducted EIA with findings, approved resolution from the PAMB before ship cruise operation	Year 2 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 150	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; DOT Fund; Private Sector donations/ sponsors	DENR, DOT, PLGU, MLGU, Academe, Private Sectors
* Review of Provincial Tourism Master Plan that will anchor in the SIPLAS Management Plan	* Findings report on the Provincial Tourism Master Plan with recommendations *Meetings with the PLGU on the harmonization of the Tourism Master Plan and SIPLAS PAMP	Year 2 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 300	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; DOT Fund; Private Sector donations/sponsors	DENR, DOT, PLGU, MLGU, SIBOL, Private Sectors
* Implement regulations on responsible anchoring practices of pumpboats	*PAMB Resolution imposing the regulations on responsible anchoring practices of pumpboats	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 5000	DENR GAA; FASPS GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; DOT Fund; Private Sector donations/sponsors	DENR, DOT, PLGU, MLGU, SIBOL, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
* Conduct research studies on Carrying Capacity to the ecotourism sites	*Report on conducted CarCap studies with findings, approved resolution from the PAMB before the conduct of the CarCap Studies, presentation of the result to the PAMB	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 600	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, DOT, PLGU, MLGU, SIBOL, Academe, Private Sectors
Formulation of Site specific ecotourism management plan	*Report on the conduct of workshops and writeshops on the preparation of site specific management plan	Year 2 to Year10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 2,250	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, DOT, PLGU, MLGU, SIBOL, Academe, Private Sectors
Updating of Site specific ecotourism management plan	*Report on the conduct of workshops and writeshops on the updating of site specific management plan	Year 4 to Year10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 2,100	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, DOT, PLGU, MLGU, SIBOL, Academe, Private Sectors
Carrying capacity study of entire SIPLAS	*Carrying capacity study report	Year 2	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, DOT, PLGU, MLGU, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
2. Waste management						
*Waste characterization; preparation of LGU SWM and WWM plans	*Report on the conduct of inspection and existing RCA Facility with maps * Conduct workshops and writeshops on the preparation of the SWM and WWM plans *Database on the approved LGU SWM plan	Year 2,4,6,8 and Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; EMB GAA; PLGU IRA;MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/sponsors	DENR, EMB, PLGU, MLGU, SIBOL, Academe, Private Sectors
*Training; design of cluster SWM facilities and appropriate WWM facilities for major point sources; fund sourcing	* SWM facilities and appropriate WWM facilities constructed to the major point source	Year 2 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 2,500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; EMB GAA; PLGU IRA;MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, EMB, DOT, PLGU, MLGU, SIBOL, Academe, Private Sectors
* Enactment of ordinances; SWM and WWM implementation; IEC	*Database on approved ordinances	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; EMB GAA; PLGU IRA;MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/sponsors	DENR, EMB, PLGU, MLGU

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
* Quarterly review and physical inspection of open dumpsites	*Report on the inspection of the open dumpsite	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 750	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; EMB GAA; research projects; private sector donations/ sponsors	DENR, EMB, PLGU, MLGU, Private Sectors
* Conduct studies on waste water discharge from barangay to coastal waters	*Report on conducted studies with findings, approved resolution from the PAMB before the conduct of the study, presentation of the result to the PAMB	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,350	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; EMB GAA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, EMB, DOT, PLGU, MLGU, SIBOL, Academe, Private Sectors
* Conduct studies on the use of mini STPs for the management of waste water		Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1000	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; EMB GAA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, EMB, PLGU, MLGU, Academe, Private Sectors
Establish sanitary system projects and fund sourcing	*Report on the establishment of sanitary system projects	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses	P 675	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; EMB GAA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, EMB, PLGU, MLGU, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
STP feasibility study	*Report on the conducted of feasibility study with findings, approved resolution from the PAMB before the conduct of the study, presentation of the result to the PAMB	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 2,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; EMB GAA; PLGU IRA; MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, EMB, PLGU, MLGU, Academe, Private Sectors
* Partnership with other sectors in the management of waste water	* MOA signed between PAMB and partner sectors in the management of wastewater	Year 2 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 300	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; EMB GAA; PLGU IRA; MLGU IRA; Academe research projects; DOT Fund; Private Sector donations/ sponsors	DENR, EMB, PLGU, MLGU, Academe, Private Sectors
* Review responsibility of water suppliers with regards to waste water management	* Monitoring report on the waste water management to the water suppliers	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 450	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; EMB GAA; PLGU IRA; MLGU IRA; Academe research projects; Private Sector donations/sponsors	DENR, EMB, PLGU, MLGU, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
3. Disaster Risk Reduction Planning and Preparedness						
*Review/ update of LGU DRRM plans	*Database on the LGU DRRM plan	Year 2 to Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; MGB GAA; PLGU IRA;MLGU IRA; Academe research projects; DRRM Fund; Private Sector donations/sponsors	DENR, MGB, PLGU, MLGU, Private Sectors
*Training on DRR planning; formulation of municipal and barangay DRRM plans	*Reports on the conduct of trainings/workshops in the formulation of the DRRM plans	Year 2 to Year 6	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (workshop)	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; MGB GAA; PLGU IRA;MLGU IRA; Academe research projects; DRRM Fund; Private Sector donations/sponsors	DENR, MGB, PLGU, MLGU, Private Sectors
*Implementation of disaster readiness programs; identification and development of safe evacuation and resettlement sites	*Monitoring report on the conduct of implementation of DRR programs	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; MGB GAA; PLGU IRA;MLGU IRA; Academe research projects; DRRM Fund; Private Sector donations/ sponsors	DENR, MGB, PLGU, MLGU, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
* Research natural protection vs. coastal erosion	* Research studies on related on natural protection and coastal erosion	Year 2 to Year 9	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (Meeting)	P 6,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; MGB GAA; PLGU IRA;MLGU IRA; Academe research projects; DRRM Fund; Private Sector donations/sponsors	DENR, MGB, PLGU, MLGU, Private Sectors
* Review municipal medical facilities	* Database Report and findings on the conduct of survey of the medical facilities	Year 2 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Academe research projects; DRRM Fund; Private Sector donations/ sponsors	DENR, PLGU, MLGU, Private Sectors
* Climate and Disaster Risk Assessment	* Report on the Climate and Disaster Risk Assessment provided by the PLGU and MLGUs	Year 2 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (Meeting)	P 5,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; MGB GAA; DOST Projects; PLGU IRA;MLGU IRA; Academe research projects; DRRM Fund; Private Sector donations/sponsors	DENR, MGB, PLGU, MLGU, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Unified hazard maps from MGB, PAGASA, PHILVOLCS, Province	* Shape files of the hazard maps in SIPLAS given by MGB, PAGASA,PHILVOLCS, and PLGU	Year 1 to Year 4	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (Meeting)	P 400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; MGB GAA; DOST Projects; PLGU IRA;MLGU IRA; Academe research projects; DRRM Fund; Private Sector donations/sponsors	DENR, MGB, DOST-PAGASA, DOST-PHILVOLCS, PLGU, MLGU
* Updating of the vulnerability maps	* Shape files of the vulnerability maps in SIPLAS	Year 1 to Year 5	*Logistics: Mylar papers, plotter printer, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and Venue (Meeting)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; MGB GAA; DOST Projects; PLGU IRA;MLGU IRA; Academe research projects; DRRM Fund; Private Sector donations/sponsors	DENR, MGB, DOST-PAGASA, DOST-PHILVOLCS, PLGU, MLGU
4. Communication, Education and Public Awareness						
*Review/update of communication plan supporting all programs	* Report on the KAP Survey Results *Updated the 5 Yr Communication Plan of SIPLAS based on findings during the study of KAP * Endorsed and adopted the Comm Plan by the PAMB	Year 3 and Year 9	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
*Develop CEPA materials	* CEPA materials procured (t-shirts, brochures, caps, video promotions, etc)	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, DSLR camera for videography, unmanned aircraft systems (UASes)/drone for aerial cinematography, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses *CEPA Materials (T-shirts, cups, ecobags, AVPs, etc.)	P 2,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
* Mobilization of LGU and other partners for LGU level and protected area wide CEPA	* Reports on the conduct of CEPA LGU level and protected area wide CEPA (Dalaw Turo, PA Youth Summit, Lakbay Aral, etc.)	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
* Celebration of SIPLAS Week	* Report on the activities conducted in support to SIPLAS week	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 2,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
* Implementation of the SIPLAS Super Squad Flagship Species for social marketing	<ul style="list-style-type: none"> * Reports on the special events featuring the SIPLAS Super Squad * Promotional video featuring SIPLAS Super Squad 	Year 1 to Year 10	<ul style="list-style-type: none"> *Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting) 	P 5,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
* Develop environmental education programs with DepEd for schools within SIPLAS	<ul style="list-style-type: none"> * MOA between DENR and DepEd on the develop of the environmental education programs * Environmental education programs included in the books and modules * Report on the Environmental Education Drive Campaign about SIPLAS to the schools in Siargao and Bucas Grande Island 	Year 2 to Year 5	<ul style="list-style-type: none"> *Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/ van/pick-up truck, gasoline/ diesel *Travel expenses * Catering and venue (meeting) 	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; DepEd GAA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, DepEd, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
* Coordinate with Telecommunication companies for the dissemination of information about SIPLAS	<ul style="list-style-type: none"> * MOA between PAMB and telecommunication companies on the dissemination of information about SIPLAS * Financial support in production of the CEPA materials (video promotions) 	Year 2 to Year 5	<ul style="list-style-type: none"> *Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting) 	P 200	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, PLGU, MLGU, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
Develop SIPLAS Module for school curriculum	* Financial support in production of materials	Year 3	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
5. Development of sustainable financing schemes						
*Identify potential activities for Payment for Ecosystem Services (PES)	*Report on the inventory to the potential activities for Payment for Ecosystem Services (PES)	Year 2 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, pumpboat/speedboat, gasoline/diesel *Travel expenses	P 400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
*Review/study user fees: adequacy, collection systems, collection efficiency; enact ordinances	* Research studies results on the users fees based on the Value of the Ecosystem Services of the important habitats within SIPLAS	Year 2 to Year 5	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and venue (meeting)	P 400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Academe research projects; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
* Focus on the collection of entrance fee from tourists	* No. of distributed environmental entrance fee tickets *Report on the entrance fee collection remitted to the IPAF RIA	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses	P 450	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU
Monitoring of Payment of Ecosystem Services (PES) to SIPLAS	*No of ORs released *Report on the PES collection remitted to the IPAF RIA	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel	P 450	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, PLGU, MLGU
*Study and establish systems for management and utilization of IPAF	* Study results on the management and utilization of IPAF * Approved WFP of the IPAF RIA endorsed by the PAMB * Report on the WFP for IPAF, presentation of the WFP to the SIPLAS-PAMB	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (meetings)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; Academe research projects; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
Governance Enhancement and Institutional Strengthening Programs						
1. Knowledge and capability building for PAMB and SIPLAS Protected Area Management Office (PAMO)						
*Conduct of capacity building trainings for SIPLAS PAMO personnel and PAMB members	* Reports on the capacity building trainings attended by the SIPLAS PAMO Personnel and PAMB members	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (workshops)	P 1,800	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
*Conduct of SIPLAS Summit/Forum	*Reports in the conduct of SIPLAS Summit/ Forum attended by the PAMB Members	Year 2 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (meetings)	P 1,800	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
Conduct of PAMB meeting (executive committee, En Banc, and Sub-Committee)	*No of approved PAMB Resolutions *No. of the minutes of the meeting	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, motorbike/van/pick-up truck, gasoline/diesel * Catering and Venue (meetings)	P 4,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA;MLGU IRA; NGO Funds; Private Sector donations/sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
2. Hiring of SIPLAS PAMO Technical and Support Staff						
*Hiring of Legal Assistant II	* Hired Legal Assistant II through Contract of Service	Year 1 to Year 10	*Contract of Service	P 2,640	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Downloaded	SIPLAS PAMO
*Hiring of Forest Protection Officer	* Hired Forest Protection Officers through Contract of Service	Year 1 to Year 10	*Contract of Service	P 3,600	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Downloaded	SIPLAS PAMO
*Hiring of Monitoring Staff (Biologist)	*Hired Monitoring Staff (Biologist) through Contract of Service	Year 1 to Year 10	*Contract of Service	P 12,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Downloaded	SIPLAS PAMO
*Hiring of Communication Staff	*Hired Communication Staff through Contract of Service	Year 1 to Year 10	*Contract of Service	P 4,400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Downloaded	SIPLAS PAMO
*Hiring of Coastal Extension Officer (CEO)	*Hired Coastal Extension Officer (CEO) through Contract of Service	Year 1 to Year 10	*Contract of Service	P 5,400	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Downloaded	SIPLAS PAMO
*Hiring of Forest Extension Officer (FEO)	*Hired Forest Extension Officer (FEO) through Contract of Service	Year 1 to Year 10	*Contract of Service	P 9,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Downloaded	SIPLAS PAMO

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
3. Collaboration and resource mobilization						
*Establish database of Memorandum of Agreement (MOA) and PAMB Resolution issued by SIPLAS PAMO	* Report on the database of the MOA and PAMB Resolutions issued by SIPLAS PAMO	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (meetings)	P 1,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA; MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
4. Policy support						
*Establish database on Policy support	* Report on the database on policy support	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (meetings)	P 1,500	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA; MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
*Report/minutes of meeting on the conduct of PAMB Meetings	* No. of PAMB Minutes and PAMB Resolutions approved and endorsed					
*Passage of Policy Resolutions in SIPLAS	*No of policy the PAMB resolutions passed					
5. Monitoring and evaluation of plan implementation						
*Report on the conduct of Monitoring and Evaluation, inspection and assessment	*Report on the conduct of Monitoring and Evaluation with findings and recommendations from the evaluators	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van, gasoline/diesel *Travel expenses * Catering and Venue (meetings)	P 2,000	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
Conduct MEA-MEAT every two (2) years	*Report on the conduct of MEA-MEAT with findings and recommendations from the evaluators	Year 2, 4, 6, 8, and 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses *Catering and venue (meetings)	P 2,000	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, BFAR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors

Strategies and Activities	Expected Output	Schedule of implementation	Resource needed	Budget ('000)	Source of Fund	Implementing Institution/Person
Conduct impact monitoring	*Site specific impact monitoring report	Year 1 to Year 10	*Logistics: Bond papers, printer, ink, laptop/ computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Travel expenses * Catering and Venue (meetings)	P 4,000	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; PLGU IRA; MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
General Administration and Management						
*Personnel Services	* Hiring of support staff personnel (admin. Staff, IT, utility, security guard, etc.) * Vouchers (Travel expenses)	Year 1 to Year 10	*Logistics: Bond papers, printer, ink,laptop/computer	P68,908,220	DENR GAA; SIPLAS IPAF-RIA and IPAF-SAGF; PLGU and MLGU IRA; NGO Funds; Private Sector donations/ sponsors	DENR, PLGU, MLGU, SIKAT Inc., RARE, SIBOL, Academe, Private Sectors
* Establishment and Maintenance of the Protected Area Facilities	* Approved WFP signed by the DENR Central Office *Report on the maintenance of the PA facilities with pictures	Year 1 to Year 10	* Logistics: Bond papers, printer, ink, laptop/computer, Cellphone for geotag pictures, motorbike/van/pick-up truck, gasoline/diesel *Infrastructure Materials: port cement, corrugated rooftop, steel, etc.) *Contract for the Winning Bidder	P 22,300	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Private Sector donations/sponsors	DENR, Private Sectors
*Procurement of office supplies, furniture and maintenance equipments	*Approved WFP signed by the DENR Central Office *Report on the procurement of the supplies with pictures *Procured office supplies, furniture and equipment	Year 1 to Year 10	* Logistics: Bond papers, printer,ink,laptop/computer	P 19,300	DENR GAA; SIPLAS IPAF-RIA, SIPLAS IPAF-SAGF; Private Sector donations/sponsors	DENR, Private Sectors

XI. MONITORING AND EVALUATION

11.1. Monitoring and Evaluation Framework for SIPLAS

The updated SIPLAS Management Plan Monitoring and Evaluation (M and E) is based on a results-based framework which means that it is focused more on the outcomes or progress of the different programs and activities identified in the plan. The desired results refer to the changes that are expected to occur from the series of interventions and activities identified in the management plan. Identifying the results of activities and measuring them are more critical concerns of M and E.

There are three (3) levels of results: outputs, outcomes and impacts corresponds to the management plan's short-term objectives, intermediate objectives or purpose, and long-term objectives or goals. The outputs are produced by the proper and timely use of inputs in various activities. Outputs that are used and managed correctly will deliver the desired outcome. If the outcomes are sustained, the desired impact will be achieved in the long term. Figure 72 shows that inputs, activities and outputs are parts of the results chain. Only when these are linked to the achievement of higher-order results do they become significant. A results-based M and E system will continuously evaluate if the management plan's implementation will result in the desired outcomes and impacts.

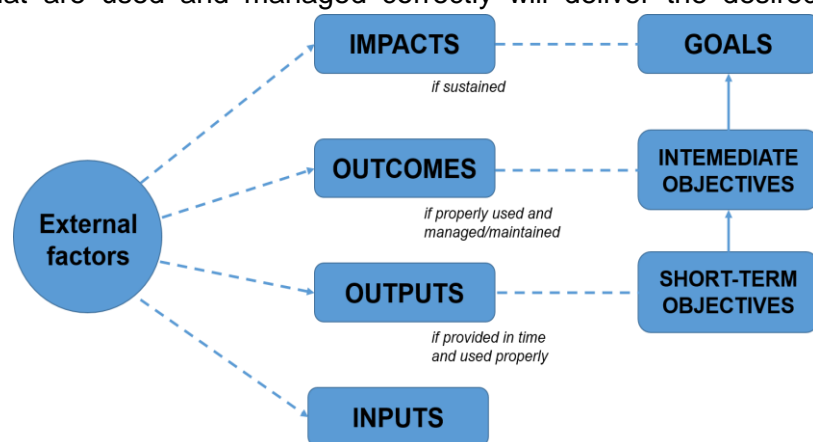


Figure 65. Hierarchy of Objectives and Results

The M and E plan provides guidelines for data collecting using a variety of approaches, as well as for evaluating the extent to which the management plan's major outputs and outcomes are achieved. It also suggests how the changes that occur in respect to the desired impacts will be documented and examined. M and E should be able to indicate or project whether the direction of the change is positive or negative, and whether the long-term impact of the change will be substantial. Changes in national policies, prioritization of national agency programs, and resource/budget allocation should all be identified as external factors that are either facilitating or hindering protected area performance. Climate change will be one of the most significant challenges to protected area management. The threats and vulnerabilities that SIPLAS faces are exacerbated by the fact that it is an island ecosystem located off the coast of the Pacific.

The SIPLAS Results Framework is presented in Figure 73 which provides the basis for the design of the M and E system. The stated results are derived from the statements of goals and objectives in Chapter IV of the updated SIPLAS Management Plan. These findings are presented in a logical order, beginning with outputs and progressing to outcomes and, eventually, impacts. Since the results are inextricably linked, M and E decisions and actions that keep implementation activities on track and steer interventions toward the attainment of the desired outputs and outcomes should increase the chances of attaining planned long-term results.

<div>IMPACTS</div> <div></div>	* Improved socio-economic conditions of upland and lowland/coastal communities		
	• Increased resilience of ecosystems and communities to threats of climate change		
	*Sustained ecosystem goods and services, i.e.,		
	*Biological diversity		
	☑ Food		
	☑ Water (surface and groundwater)		
	☑ Natural protection from hazards		
	☑ Aesthetics		
<div>OUTCOMES</div> <div></div>	Effective management of critical habitats		
	• Improved vegetative cover		
	• Improved availability of water for domestic water supply and irrigation		
	• Diversified sources of income and employment of communities		
	• Reduced exposure of communities in the nine LGUs to natural and climate change related hazards		
•Improved PA management effectiveness			
<div>OUTPUTS</div> <div></div>	Management of Strict Protection Zone	Management of Multiple Use Zone	Institutional Strengthening
	*Critical habitats with approved management plans.	*Areas under productive development (agroforestry, fuelwood plantations, woodlots)	*Functional PAMB
	*Water Production areas with approved Management Plans.	*Tenured areas in forestlands with approved management plans	*Active and effective cluster managemnet committees
	*Marine Protected Areas (MPA's) established	*Water Production areas with approved Management Plans.	*Signed PAMB agreements with stakeholders, reasearch and academic institutions
	*Active enforcement bodies (terrestrial and coastal)	Eco-tourism areas with approved management and business plans	*Governance enhanced policies, procedures and enforcement protocols
	*Areas under rehabilitation (including corals)	*Community-based enterprises established	*User fee/PES systems developed
	*No-build zones (in high hazard areas) established	*Approved disaster risk reduction plans for LGU's and highly vulnerable communities/Barangays	*IPAF management system established
ACTIVITIES	Site-Based Management Activities		Institutional Strengthening Activities
<div></div> <div></div>	*Formulation of detailed management plans for critical habitats and water production areas	*Formulation of Management Plans for tenured areas, water production areas	*Capability assessment and development
	*Training and Deputation of enforcement team	*Formulation of coral rehabilitation plans.	*Review enhancement and harmonization of policies procedures and enforcement protocols
	*Demarcation of SPZ boundaries (terrestrial and coastal and marine)	*Formulation of Management and business plans for eco-tourism areas (with carrying capacity analysis)	*Joint planning activities (e.g., MPA Forum)
	*Biodiversity research/documentation	*Disaster Risk Reduction Management (DRRM) planning and disaster preparedness at LGU and community barangay level	*Resource valuation/user fee determination studies
	*Protection and Rehabilitation	*Agroforestry Development; reforestration and rehabilitation; establishment of fuelwood plantation and woodlots.	
		*Market Studies and Business planning for community enterprises	
	Cross-cutting Activities : Information, education and communication (IEC); enforcement; training		
	Line agency and LGU budgets, staff services, technical assistance inputs, PAMB approved management plan, inputs of cooperators and other partners		
INPUTS			

Figure 66. SIPLAS Results Framework

M and E will cover outputs, outcomes, and impacts, with an emphasis on the outcomes. The outcomes will serve as proof that the generated outputs are correct and are being used or properly implemented. The outcomes will also determine whether or not the desired impacts can be accomplished.

The M and E plan identifies appropriate indicators for each of the outputs and outcomes identified in the results framework. These indicators are discussed and defined with the corresponding suggested method for data collection, recording and analysis. For the outcomes, the data that may be used as baseline or reference point for measuring the change are indicated.

M and E plan focuses on the evaluation on the resiliency goal, since climate change adaptation is the main theme of the updated SIPLAS management plan. Climate change vulnerability is determined by three factors, namely, (1) forms and magnitudes of climate change exposure; (2) system sensitivity to climate hazards; and (3) system adaptive capacity. Significant to the evaluation process is the examination of the continuing relevance, effectiveness and sustainability of interventions designed or reduce the vulnerability of ecosystem and communities. Observation on indicator species that are sensitive to the effects of climate change such increasing temperature will be used as evidences of improved resilience.

The indicators in the Results Framework are a selected set from a large set of indicators and data that can be possibly be gathered for SIPLAS. These indicators are deemed to support the decision making that is expected to be made by the SIPLAS PAMB, DENR Region XIII, SIPLAS PAMO, the nine (9) SIPLAS LGUs, Non-Government Organization (NGOs), National Government Agencies (NGAs), and other key stakeholders regarding the SIPLAS management. The suggested methods for data collection make use of tools that are available, deemed practical and cost-effective. It is suggested though that the currently used standard data collection methods of DENR and the Biodiversity Management Bureau (BMB) be reviewed and modified to enhance the utility of these tools and consider the uniqueness of different protected areas.

In case there will be new policies on protected area management and/or unforeseen events/scenarios, the operational plan will be adjusted if necessary. Changes or adjustments will be based on the results of the monitoring and evaluation.

11.2. Outputs and Indicators

The major outputs shown in the Results Framework (Figure 73) represents the final outputs of activities and processes that include assessments, stakeholder consultations, and evaluation of management options, detailed implementation planning and budgeting, and legitimization or approval of management plan. The final outputs are classified into three (3) sets. One set applied to strict protection zone (SPZ) and another set is for the multiple use zone (MUZ). The SPZ and MUZ have different functions and on-site activities to be undertaken within each zone, in the same manner, the set of outputs for each zone will also will differ from each other. The third set of output relates to the strengthening of the institutions involved in managing the SPZ and MUZ in SIPLAS.

The three (3) sets of outputs are reflective of the combination of site management and institutional development interventions in the SIPLAS management plan. Basically, this suggests that institutional strengthening must go hand in hand with the site management of SPZ and MUZ in order to achieve the next level of results.

Taken altogether, the identified outputs can also be classified into six (6) general types:

- Important management units within the SPZ or MUZ of SIPLAS is to have an approved management plan. These management units will include wildlife habitats/sanctuary, marine protected areas (MPAs), watershed areas, eco-tourism sites, tenured areas, and no-build zones in high risk/highly vulnerable areas. In the zoning map of SIPLAS, these management units are distributed across LGUs. The site specific management plans will operationalize the overall protected area management plan and define the specific objectives, strategies, targets, and resource manager for each management unit. The site management plans will be the basis of the succeeding rehabilitation and protection.
- Disaster risk reduction and management (DRRM) plans of the LGUs that incorporate the clear plans of action for upland and coastal communities/barangays that are located in areas identified as highly vulnerable to various types of natural and climate related hazards. The communities and barangays may opt to have their own DRRM plans.
- Income enhancing activities such as agroforestry and community-based enterprises.
- Organizations and organizational arrangements for management plan implementation and policy making. This primary refers to the SIPLAS PAMB organization and the various institutions which have management agreements with the PAMB, including those which have been granted tenurial rights over forestlands.
- Governance-enhanced policies, procedures and protocols for SIPLAS-wide activities or for specific sites or land uses.
- User fee and other financing schemes (including payment for environmental services or PES and the IPAF) that are established to enable resource managers to generate additional funds for resource management.

Table 98 provides the list of the suggested quantitative and qualitative indicators. Qualitative indicators describe the conditions that will determine the accomplishment of the outputs. The rationale for the output and the indicators are discussed in the remarks. Such will be a useful reference understanding the outputs.

Table 99. Summary of Output Indicators and Data Sources

Outputs	Indicators	Sources of Data	Remarks
A. Strict Protection Zone			
1. Local Conservation areas with approved management plans	<ul style="list-style-type: none"> Types of habitats with management plans reviewed and approved by PAMB for implementation * Established BAMS sites 	SIPLAS PAMO records	The SIPLAS management plan provides the overall zoning and management strategies for the protected area. These need to be translated into more detailed management activities (based on set management prescriptions) for specific management units in specific locations such as important indicator species habitats, e.g., Philippine tarsier, Rufous Hornbill, Tarictic Hornbill, Saltwater Crocodile, Philippine Crocodile and other important habitats such as old growth forests in Sudlon, Socorro; mangrove forests of Del Carmen. These sitespecific management plans have to be approved by the SIPLAS PAMB.
2. Water production areas with approved management plans	<ul style="list-style-type: none"> Identified and delineated water production areas in SPZ with management plans approved by the PAMB Area (in hectares) of water production areas covered by management plans 	SIPLAS PAMO, municipal and barangay LGUs, water utilities records	Actual and potential sources of water located in the SPZ for domestic water supply will be identified and delineated for protection and management. These areas should be covered by management plans which will indicate the entity (LGUs, water districts, water well operator) should be responsible for the protection of the water sources and the protection activities that will be undertaken. The management plans have to be approved by SIPLAS PAMB.
3. Cave classified as Class I with approved management plans	<ul style="list-style-type: none"> *Types of cave with PAMB approved management plans *Existing cave covered by approved management plans 	SIPLAS PAMO, municipal and barangay LGUs	
4. Inland Wetland Conservation with approved management plan			

Outputs	Indicators	Sources of Data	Remarks
5. Marine protected areas (MPA) established	<ul style="list-style-type: none"> Number of MPAs meeting the indicators and benchmarks for Level 1 management effectiveness Area (in hectares) of MPAs established 	LGU reports on MEAT results for each MPA	The MPA Effectiveness Assessment Tool (MEAT) is being used by the MPA Support Network (MSN) ⁴ to assess the effectiveness of the management of MPAs. It has four (4) levels. Each has a corresponding set of indicators and benchmarks. Level 1 is the lowest level and is equivalent to the establishment of an MPA. An approved management plan is a requirement for Level 1 thus for MPAs there is no separate indicator for the management plan.
6. Active enforcement bodies		Memorandum of Understanding, operation report, training reports, deputation order) SIPLAS PAMO, municipal and barangay LGU enforcement reports and records	DENR and LGUs are supposed to have joint enforcement teams (e.g., Bantay Gubat; Bantay Dagat) that regularly patrol upland forests, mangrove areas and coastal and marine areas. These teams include volunteers from the local community. These enforcement teams are supposed to be trained, deputized
7. Areas under rehabilitation (including corals)	Areas within natural forests, old growth mangroves and coral reefs within MPAs that are under rehabilitation and have been rehabilitated, per approved management plan and agreed prescriptions.	SIPLAS PAMO and municipal and barangay LGUs field monitoring reports; Municipal Agriculturist's Office (MAO) records;	The approved management plans for critical habitats may provide for the rehabilitation of specific sections that are degraded, including coral reefs. The extent of rehabilitation work done will need to be measured and reported.
8. No-build zones established in high hazard areas	No-build zones delineated and declared as such in the LGU zoning ordinance or other local ordinance	Municipal LGU Comprehensive Land Use Plan (CLUP)/zoning ordinance; other ordinances/issuance	There are high hazard areas, especially in the coastal areas, which should be established as no-build zones to reduce risks of communities from climate related events such as coastal flooding and storm surges. The LGU should include identified high hazard areas in their CLUP and zoning ordinance, or enact a separate ordinance for its enforcement.

⁴MPA Support Network (MSN) was formed through a Memorandum of Agreement (MOA) signed in 2006 by various government agencies, non-government organizations and academic institutions which have committed to work together for the sustainable development of the country's coastal and marine resources. Signatories include DENR-PAWB (now BMB), DA-BFAR, DILG-BLDG, DOST-PCAMRD, U.P. Marine Science Institute (UPMSI), Conservation International-Philippines (CI-P) World Wildlife Fund –Philippines (WWF-P), and Coastal Conservation and Education Foundation, Inc. (CCEF). MSN's support to MPAs includes providing an incentive system for good MPA governance and performance through biannual recognition awards to communities with outstanding MPA management performance. Refer to www.mpasupportnetwork.org.

Outputs	Indicators	Sources of Data	Remarks
B. Multiple Use Zones			
1. Tenured areas with approved management plans	Tenured areas (in hectares) in forestlands with management plans approved by DENR/PAMB	SIPLAS PAMO records	PACBRMA holders are required to prepare management plans for the area tenured to them. These tenure holders are to be assisted by DENR PENRO in the preparation of their management plans which are to be approved by DENR/PAMB.
2. Water production areas with approved management plans	<ul style="list-style-type: none"> Identified and delineated water production areas in MUZ forestlands with management plans approved by the PAMB Area (in hectares) of water production areas covered by management plans 	SIPLAS PAMO, municipal and barangay LGUs, water utilities records	Actual and potential sources of water located in MUZ forestlands for domestic water supply and small scale irrigation will be identified and their catchment areas mapped and delineated for protection and management. These areas should be covered by management plans which will indicate who (municipal or barangay LGU, water district, water cooperative) should be responsible for the management of the watershed/recharge areas of the water sources and what management activities will be undertaken. The management plans have to be approved by PAMB.
3. Areas under productive development	<ul style="list-style-type: none"> Areas in forestlands or private lands (in hectares) that are under development as agroforestry farms, multi storey croplands, orchards, perennial crop plantations, tree plantations and fuelwood lots 	SIPLAS PAMO and municipal and barangay LGUs field monitoring reports; Municipal Agriculturist's Office (MAO) records; tenure holders and private land owners	SIPLAS has areas in its forestlands (tenured areas) and A and D lands that can be developed more productively. Tenure holders and private landowners will be encouraged to diversify crop production through agroforestry, multi-storey cropping, orchards, and perennial crop plantation. Production of fuelwood is also encouraged to reduce the threat to mangroves and forests. The areas where these developments are taking place will be periodically monitored. The area under development will be estimated and reported.
4. Eco-tourism areas with approved management and business plans	<ul style="list-style-type: none"> Eco-tourism areas (by type) with management and business plans that are approved by the PAMB 	LGU reports on operation of eco tourism sites	A number of eco-tourism areas in SIPLAS are being operated and promoted by LGUs. There are more that have yet to be developed. These eco-tourism areas should have management and business plans that consider their carrying capacities (i.e., tourists) and that promote the protection/ conservation of natural resources found within them. These management plans must be approved by the SIPLAS PAMB.

Outputs	Indicators	Sources of Data	Remarks
5. Community based enterprises established	<ul style="list-style-type: none"> · Potential community-based agriculture, fisheries or tourism based enterprises with business plans · Community-based agriculture, fisheries or tourism based enterprises that are financed · Total public and private investments (in pesos) in community-based enterprises 	Reports of People Organizations (POs) on their business operations; LGU reports	Community-based enterprises are to provide alternative sources of incomes to local communities, which will enhance their adaptive capacity. The potential viability of proposed business enterprises must be closely studied and actual investments must be supported by a business plan, otherwise, these might not result in increased employment and incomes. Investments will include actual capital to start the enterprise (which may come from the PO, private investor or government agency) as well as support facilities that may be provided by the government (e.g., access road) or private sector.
6. Disaster risk reduction plans approved	<ul style="list-style-type: none"> · Approved LGU and community or barangay DRRM plan for high risk areas within SIPLAS · LGUs annual budget allocation for DRRM 	Municipal and barangay LGUs DRRM plans; LGU DRRMC reports	DRRM plans are critical in SIPLAS in view of the natural and climate related hazards that local communities face. DRRM planning is included in the management plan as an important climate adaptation measure. It is also indicative of the preparedness of municipal and barangay LGUs for any disaster that might hit Siargao Island. LGUs are required by law to prepare DRRM plans and allocate budget for their implementation. The highly vulnerable communities and barangays should be encouraged to prepare their own DRRM plans.
C. Institutional Strengthening and Governance			
1. Functional PAMB	<ul style="list-style-type: none"> · PAMB with active committee system and secretariat support, and funding · Annual average percent attendance of members or designated alternates in PAMB meetings · Continuing education program organized for PAMB members 	SIPLAS PAMB meeting documentation	The SIPLAS PAMB en banc has 160 members and is supposed to meet twice a year. The 28-member Executive Committee meets quarterly. A functional SIPLAS PAMB is one which has a PA management plan, regular budget for PAMB Manual of operations, technical support from DENR and LGUs, and a committee system in place that enables it make fast and effective decisions. Its functionality is enhanced by a high rate of attendance and a continuing education program (through short technical sessions, information materials, best practices sharing) that will allow them to understand current and emerging concerns in PA management.

Outputs	Indicators	Sources of Data	Remarks
2. Active and effective cluster management committees	<ul style="list-style-type: none"> Sub-committees formed and regularly holding meetings to address concerns relevant to the sub-watershed Annual average percent attendance of members or designated alternates in PAMB meetings 	SIPLAS PAMB Sub-committee meeting documentation	It supported by the PAMB Manual of Operations that emphasizes the SIPLAS PAMB create 9 committees to further decentralize discussions and deliberations on issues and plans that concern a particular cluster of LGUs. Each committee represents a different set of issues and challenges. These committees will thresh out issues, monitor performance, review proposals/applications, and evaluate options for specific concerns. Recommendations will be elevated to the ExeCom or the PAMB en banc for confirmation and adoption.
3. Signed PAMB agreements with stakeholders	<ul style="list-style-type: none"> Number of agreements (e.g., MOAs) between PAMB and stakeholders MPA network agreement among LGUs and signed by SIPLAS PAMB 	SIPLAS PAMO	<p>Stakeholder participation is encouraged in the management of SIPLAS. The PAMB can enter into agreement with municipal and barangay LGUs, POs, NGOs, water districts, operators of tourism establishments and other entities for the management of specific areas within SIPLAS. These MOAs will not only pertain to the use of resources but should assign clear management responsibilities to the other signing party.</p> <p>The MPA network agreement is one such agreement. Under this agreement, LGUs are designated as the managers of the MPAs that they will set up in their respective municipalities. The PAMB can also have formal agreements with private resort owners for the management of natural resources that are near their areas of operation.</p>
4. Governance enhanced and harmonized policies, procedures and enforcement protocols	<ul style="list-style-type: none"> Policies, procedures and protocols reviewed and approved for implementation by SIPLAS PAMB PAMB approved policies, procedures and protocols translated into LGU ordinances or integrated in LGU plans Unified (inter-LGU) fishery ordinances enacted by individual LGUs 	SIPLAS PAMO and LGU records	The management plan will require policy support for implementation. These will be in the form of PAMB resolutions and issuances on specific procedures and protocols related to the management of SIPLAS. These will become more enforceable if these are translated or supported by LGU ordinances and/or harmonized or integrated into LGU plans. The formulation of unified fishery ordinances by the nine LGUs in SIPLAS will strengthen enforcement of fishery regulations within SIPLAS.

Outputs	Indicators	Sources of Data	Remarks
5. User fee and other schemes developed	<ul style="list-style-type: none"> User fee proposals and other revenue generation schemes developed and approved by the PAMB for implementation 	SIPLAS PAMO and LGU records	There are in SIPLAS a number of opportunities to generate revenues/ funding from user fees and other schemes particularly in water use and tourism/eco-tourism. Some LGUs have already introduced user fees in their eco-tourism/tourism sites. Current and proposed user fee and other schemes, including PES will have to be reviewed, based on resource valuation studies or similar assessments, and approved by PAMB. The user fee system should provide for the plow-back of revenues to resource management.
6. IPAF management system established	<ul style="list-style-type: none"> Revenue inflows to IPAF per year (in Php) Utilization of IPAF per year (in Php) 	SIPLAS PAMO	The IPAF is derived from various revenues resulting from the operation of the protected area, including grants and donations. About 75% of the revenues is retained by the PAMB and used for the protection, maintenance, administration, and management of the protected area and PAMB-approved projects. It is important that the PAMB has a transparent system for accounting revenues and the utilization of the fund.

For the monitoring of each of these outputs indicators, it is necessary to consider the following:

- The baseline or the pre-implementation condition. This can be based on the situational analysis in the plan or through initial data collection. For most of the identified indicators there may be no applicable baseline data as most of the activities can be considered as new initiatives in SIPLAS. For these, a qualitative description of the situation will suffice.
- Targets for specific time periods: quarterly, semi-annual or annual. The updated management plan provides the major targets and the indicative timeframe for the completion of specific activities.
- The frequency of data collection. This can be monthly, quarterly or annually, depending on the regularity of the activity and the time needed to produce the output. The data collection frequency may be based on how the targets are programmed over the plan period.
- The data recording format and the database structure for the storage of the collected data. A data record or template will have to be developed for each indicator or group of indicators. The recording form should be simple enough to facilitate the integration of related data sets into a database.
- Data interpretation. For the output level, the data analysis will mostly involve comparison of the data gathered on each indicator with the target in the plan and the time within which the output is supposed to be completed. M and E findings are often expressed in terms of percent of target that is met (e.g. 55% of LGUs or 5 out of the 9 LGUs have DRRM plans and budget allocation of PxxM), progress milestones or

requirements that are achieved (e.g., MPA X has achieved 2 out of the 5 thresholds under Level 1 management effectiveness), percent of time that has elapsed (e.g., 20% accomplishment vs 50% of time elapsed) and time slippage (25% accomplishment vs 60% that should have been achieved to date). Targets, even indicative ones, are thus important to be able to analysed progress or performance.

- Reporting frequency to SIPLAS PAMB, LGU and other stakeholders. Reporting to SIPLAS PAMB will be based on the frequency of its *en banc* meetings (i.e., at least twice a year) or of its Executive Committee meetings (i.e., quarterly). The SIPLAS PASu and the Local Working Group (LWG) will determine opportunities and appropriate venues for reporting on protected area performance to LGU Sangguniang Bayan, communities/barangays and other key stakeholder groups.
- Submission of reports. While some data collection will be done quarterly, it is recommended that the analysis and the reporting on specific outcomes be on semi-annual or annual basis.

An Output Indicator Sheet may be prepared for each output.

11.3. Outcomes and Indicators

Similar to the outputs, the outcomes that are shown in the Results Framework (Figure 73) are also classified into three (3) sets. One set pertains to resource management outcomes: improved management of critical habitats, improved vegetative cover, and improve availability of safe water, diversified sources of income and employment, and reduced exposure of communities to threats of disaster and climate change. It will be noted that the water indicator appears in both sets. This is because the improvement of water availability is both a resource management and socio-economic concern. For SIPLAS, it is recommended that the indicator be made part of socio-economic outcomes as the indicator emphasizes “access” and “safe” water both of which are important to protect the health of water users. The 3rd type of outcome is on governance or the improve effectiveness of protected area management.

The mix of bio-physical, socio-economic and governance outcomes is again reflective of the multi-dimensional objectives of the updated protected area management plan. Biodiversity conservation is an important concern in SIPLAS as it is known to be biodiversity rich. However, since the protected area covers the whole island with nine LGUs (including alienable and disposable or A&D lands), the management plan necessarily has to provide for the socio-economic development of the local communities, and better governance and collaboration arrangements among LGUs and key stakeholders. The management plan seeks to put into place better resource management for the socio-economic development in SIPLAS. Improved governance comes into play in the strengthening link and interaction between communities and natural resources.

The plan also aims to strengthen the resiliency of both ecosystems, and communities and their livelihoods to the impacts of climate change. Part of building up resiliency and the adaptation capacity of communities is the improvement of their economic conditions. Organization and institutions that are given management responsibility over specific resources have to be capacitated to become effective resource managers and be provided with more options to improve their livelihoods. SIPLAS successful management depends on how the different interventions are balanced and carried out so that interrelated resource management, socio-economic well-being and good governance objectives are met.

These outcomes and the suggested indicators are summarized in Table 99 where indicators are described/defined with the corresponding unit of measure, management utility, data sources, method and frequency of collection, responsibility centers, data quality issues, and available/suggested baseline data. Such tools are Biodiversity Monitoring System (BMS), MEAT, NEAT, and METT. The Management Effectiveness Tracking Tool (METT) shall be utilized for assessing the performance and effectiveness of the Management Board and shall be conducted every two (2) years.

The outcome indicators are also a mix of quantitative and qualitative measures. Some of the outcomes have multiple indicators. This applies to outcomes or desired changes (i.e., improvement and effectiveness) that cannot be measured directly or described sufficiently using a single indicator, or to changes or results that can best be described using a set of desirable conditions or threshold actions. For example, vegetative cover and water have both quality and quantity aspects. Information on both aspects are needed to describe the result being examined.

Table 100. Summary of Outcome Indicators and Data Sources

Outcomes	Indicators	Source of Data
A. Resource Management		
Effective management of critical terrestrial, and coastal and marine habitats	<p>Area of critical habitats that are under effective management</p> <p>For terrestrial habitats and mangroves, under management means:</p> <ul style="list-style-type: none"> Management activities are being carried out according to the approved management plan Incidence of illegal activities and forest fires reduced significantly Sightings and observations show evidences of the presence of indicator species (flora and fauna) <p>For established marine protected areas (MPAs), under effective management mean:</p> <ul style="list-style-type: none"> MPA management effectiveness level is at least Level 2 Incidence of illegal fishing and harvesting practices reduced significantly Sightings and observation show evidences of the presence of indicator species (flora and fauna) within and outside the MPA Observations and feedback that indicate improving fish abundance or fish catch 	<ul style="list-style-type: none"> DENR/PASu, DENR Provincial Environment and Natural Resources Office (PENRO) reports PASu Office, municipal and barangay LGUs enforcement reports, records (logbooks, field diaries, geo-tagged photos) BMS (modified) reports LGU MPA assessment results using the MEAT LGU enforcement records/reports Results of participatory coral reef monitoring of LGU/LWG Results of LGU perception surveys, fish visual census
Improved vegetative cover	<ul style="list-style-type: none"> Percent of SIPLAS land area with good vegetative cover Area of closed canopy forest 	<ul style="list-style-type: none"> National Mapping and Resource Information Authority (NAMRIA) vegetative cover maps; site validation reports/map
B. Socio-Economic Development		
Improved availability of safe water	<ul style="list-style-type: none"> Percent of population of SIPLAS barangays with access to water supply Percent of water wells meeting water quality standards /Number of SIPLAS barangays with reported occurrences of water-related health problems Area of farms irrigated by small communal irrigation systems Water extraction for water supply and small irrigation systems 	<ul style="list-style-type: none"> Municipal LGUs updated profile Inventory of water systems Reports on top causes of morbidity LGU-Municipal Agriculturist's Office (MAO) reports on small irrigation systems established Irrigators associations reports on water extraction (if available) and area irrigated Records of water districts/utilities Records of other major water systems (resorts, hotels, large establishments)
Diversified income sources and employment opportunities	<ul style="list-style-type: none"> Number employed in community-based ecotourism services Number of operational/viable community enterprises and Number of members employed Area of productive agroforestry and Number of households benefitted 	<ul style="list-style-type: none"> Report of partner POs or operators of ecotourism facilities Production record of POs managing community enterprise PASu Office, tenure holders, and LGU-MAO reports

Outcomes	Indicators	Source of Data
Reduced exposure of communities to threats of disasters from natural hazards and climate change	<ul style="list-style-type: none"> Disaster preparedness of LGUs and vulnerable barangays/communities Value of damages to property, infrastructure and livelihoods of events related to natural hazards and climate change 	<ul style="list-style-type: none"> LGU-DRRMC reports Barangay reports
C. Governance		
Improved SIPLAS management effectiveness	<ul style="list-style-type: none"> Annual PA management effectiveness rating MPA network effectiveness level Harmonized LGU and PA management plans Increased resources/revenues generated for on site management activities 	<ul style="list-style-type: none"> DENR report on results of METT(modified) LGU/MPA network report on results of NEAT LGU-Municipal Planning and Development Office staff; approved LGU-CLUP DENR/PASu and LGU reports on environment and natural resources (ENR)-related revenues and expenditures

11.4. Impacts and Indicators

SIPLAS is vulnerable to climate hazards such as increasing temperature, erratic rainfall distribution, and extreme climate events such as typhoons with strong winds and intense precipitation, droughts, and heat events. As an island ecosystem, SIPLAS is also vulnerable to storm surges and sea level rise. A long-term goal in the SIPLAS management plan is enhancing its climate resilience to reduce the vulnerability of the protected area to the adverse effects of these hazards.

Vulnerability to climate change is a function of three (3) factors, namely: (1) types and magnitudes of **Exposure** to climate change; (2) **Sensitivity** of the ecosystem to climate hazards; and (3) **Adaptive Capacity** of the system. In the updated 10-year SIPLAS management plan and expected complementary actions and plans of LGUs, the climate change adaptation strategies and measures towards reducing **Exposure**, minimizing **Sensitivity**, and increasing **Adaptive Capacity** are summarized below:

Exposure (E)	Sensitivity (S)	Adaptive capacity (AC)
<ul style="list-style-type: none"> Reducing the area of vulnerable areas by zoning and restricting development in high hazard areas Relocation of affected or vulnerable communities Rehabilitation of mangroves to provide natural protection to coastal communities; restricting the conversion of mangrove Slope stabilization measures to reduce occurrence of landslides Regulation of water extraction and water quality monitoring Harmonizing protected area management plans with CLUP; integration of DRR and climate change adaptation to CLUPs Strengthening of disaster management program; disaster readiness 	<ul style="list-style-type: none"> Crop diversification; introduction/ promotion of hazards-tolerant crops/trees Protection and management of water production areas Promotion of water and soil conservation measures in production systems <div> <p><i>Other possible complementary LGU actions:</i></p> <ul style="list-style-type: none"> <i>Structural measures such as dikes, levees, etc. to protect shorelines.</i> <i>Retro-fitting of existing water ways, channels, etc.</i> <i>Improving design standards for infrastructures to cope up with climate hazards.</i> </div>	<ul style="list-style-type: none"> Enhancing biodiversity of ecosystems through effective management and protection of wildlife habitats/sanctuaries; increasing forest areas; enforcement Effective management of Marine Protected Areas (MPAs) Coastal enforcement Raising awareness to communities of potential hazards that make them vulnerable and of adaptation measures Capacity building through trainings, seminars, workshops, etc. Providing alternative livelihood opportunities to communities. <div> <p><i>Adaptive capacity increases as unemployment and poverty incidence decrease.</i></p> </div>

This $V=f(E, S, AC)$ framework will be adopted in the assessment of the impacts of adaptation strategies and measures. However, because of the uncertainties in climate change variables and of data limitations, the changes in vulnerability at best can only be assessed qualitatively. At best, the analysis can only show the direction of the change. The proposed evaluation process will have two (2) parts:

1. Detailed review of the adaptation measures implemented to reduce vulnerability, i.e., reducing **Exposure**, minimizing **Sensitivity**, and increasing **Adaptive Capacity**, and assessment of their continuing relevance, effectiveness and sustainability. It is

proposed that this evaluation activity be undertaken at two (2) time periods: at mid-point and at the end or towards the end of the plan period.

The valuation will look into the adopted adaptation measures and the extent to which these are implemented; the results that can be attributed to the adaptation measures; the continuing relevance and appropriateness of the adaptation measures to the current and the longer-term projected conditions in SIPLAS; and the arrangements that are in place to sustain their implementation and results. The evaluation will take into account the occurrences of typhoons, floods, storm surges, droughts and other climate related events in SIPLAS since the management plan was implemented and related the adaptation measures to them. Updated climate change projections released by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) will also be important considerations.

Since climate change adaptation measures are location-specific, the evaluation of the measures will have to be done in relation to specific locations where these were applied. These would mostly be high-hazard or highly vulnerable areas. The key evaluation parameters are:

- a. Effectiveness (or potential effectiveness) to reduce the impacts of climate hazards on the habitat or location;
- b. Suitability of measure to current local conditions and resources available; acceptability to local communities; continuing relevance to projected conditions
- c. Direct and indirect benefits to the ecosystem and to the livelihoods of communities; and
- d. Capability and capacity of LGUs and other stakeholders to implement and sustain the measures.

Reference will be made to the results of output and outcomes monitoring as these will be useful inputs to the evaluation. Specifically, policies, management plans, technical capability, budgets, institutional arrangements, and agreements will be important determinants of the sustainability of adaptation measures.

The assessment will make use of the following methods:

- a. Review the analysis of reports and historical records of the SIPLAS PAMO, municipal and barangay LGUs on past accomplishment of the relevant outputs and outcomes. Compiled data in associated databases will be analysed.
- b. Analysis of climate monitoring and prediction data of PAGASA to establish the changes in rainfall pattern and intensity, changes in temperature and the occurrence of climate related events such as typhoons and droughts in the island and in northeastern Mindanao. Trends will be analysed and comparison will be made between actual data in the past few years and the projections that were used for the vulnerability assessment in the plan. Updated long term climate change projections will also be studied.
- c. Review of LGU-DRRMC and other reports (e.g., DA on droughts) on the occurrence of floods, landslides, droughts and the damages these have caused on crops, livelihood, private property and public infrastructure.
- d. Interview of key informants. Respondents will include the PASu, LGU Chief Executives, Technical Officers (MPDC, MENRO, MAO, etc.) and relevant government agencies.
- e. Participatory workshops and FGDs with community leaders, volunteer enforcers, and members of various local groups (upland farmers, fisherfolks,

people's organizations, eco-tourism workers, women and youth, civil society, operators of tourism facilities/resorts, private sector).

- f. On-site assessments where the adaptation measures have been implemented or where there have been occurrences of climate hazards.

The resulting analysis should show at least in qualitative terms the direction of any change on the vulnerability of specific high hazard areas as a result of the measures to reduce **Exposure**, minimize **Sensitivity**, and increase **Adaptive Capacity**. Recommendations should indicate whether there is a need to intensify the implementation of adaptation measures, refine/revise implementation strategies, or adopt additional/alternative measures given new climate change realities in SIPLAS and in the CARAGA Region.

This evaluation activity will require some expert decision particularly if the available data is limited. The best arrangement is to assign this task to a qualified third party evaluator. The involvement of the academe, e.g., Surigao State College of Technology (SSCT), is encouraged.

2. Periodic monitoring of indicators species that provide easy indicators of climate change effects and impacts.

For a small island ecosystem like SIPLAS, monitoring the immediate effects of climate change is a must. The ultimate fate of all organisms inhabiting every single niche on a small island is that of extirpation. This study will enable the SIPLAS PAMB to understand the extent of biodiversity loss that the SIPLAS is facing with the increasing temperature.

The following flora and faunal species are recommended as frontline indicators for monitoring climate change resilience ecosystems:

- ***Selaginella jagorii*** (kamariang-gubat, Selaginellaceae). This is a herbaceous fern ally that thrives in relatively moist conditions. Their survival will be threatened by increasing temperature and reduction of atmospheric moisture.
- **Tree ferns**, such as *Angiopteris palmiformis* (Pakong buaya, Marattiaceae), *Blechnum orientale* (Blenchnaceae), *Cyathea contaminans* (tree ferns, Cyatheaceae), *Asplenium nidus* (Pak-pak-lawin, bird's nest fern, Aspleniaceae). These terrestrial ferns that thrive along banks of rivers, streams, brooks, and sloughs. With increasing temperature, they exhibit first poor growth conditions followed by poor spore production leading to little or no production of new plant individuals. Eventually, dry condition of the habitats results to death of over mature, unproductive individuals. For tree ferns, the rapid decrease in population density may also be attributed to over-collection of trunks that are used as medium for orchid growing both on small/household or commercial scale. For epiphytic ferns and other plants, reduction in atmospheric moisture at certain time of the day becomes a critical factor determining their survival on a long term basis.
- **Fire orchid** (*Renanthera philippinensis*) and similar orchids (e.g., *Habenaria malintana*, *Calanthe triplicate*, *Spathoglottis plicata*, *S. rosea*, etc.). These are very sensitive monitors of climate change. Fire orchid is an endemic species of

the area and reduction of population density is tied up to the rapid loss of soil moisture in its natural habitats, usually along the fringes of dipterocarp forests.

- **Rana spp.** (Palakang langit, Palakang kabkab, etc.). The terrestrial and arboreal frogs and toads are very sensitive monitors of climate change due to the very nature of their morpho-anatomy. It is common knowledge that frogs and toads breathe through their skin surfaces and in order to have maximum efficiency in breathing, the moist condition of the skin surface must be maintained. With increase in temperature leading to high rate of evapo-transpiration, skin surface become dry and breathing activity is hindered. Persistence of this event leads to various abnormalities and eventually, the death of individuals. On a shorter period, the migration of frogs and toads to higher elevation (presumable with still moist habitats) on an episodic basis is a good monitor of rapid but erratic changes in moisture regime at lower elevation attributable to climate change.
- **Frugivorous monitor lizards** (e.g., *Varanus olivaceous*, Butaan). This species of monitor lizards depends on ripe fruits of forest plants for their food. The usual plant food sources of this species are ripe fruits of Pandanus spp. (e.g. *Pandanus radican*, *P. tectorius*, *P. copelandii*, *P. littoralis*, etc.) as well as *Sararanga philippinensis* (another genus of Pandanaceae) and strangler plant (belonging to genus *Ficus*, e.g. *F. subulata*) and erect member of the genus *Ficus* like *F. minahassae* (Hagimit), *F. nota* (tibig), etc. With climate change already affecting the reproductive capacity of epiphytic as well as terrestrial plant food sources of this lizard species, the ultimate impact is reduction in population size due to mortality. Migration to other islands with more conducive conditions is not possible as this species cannot tolerate salt water.
- **Mangroves.** Mangroves live in intertidal area. Their pneumatophores-breathing roots must be exposed to the air during low tide or else they will die. They are most likely be affected with sea level rise.
- **Seagrasses.** Increase in sea surface temperature will affect the reproductive capacity of seagrasses. With sea level rise and increased turbidity in coastal areas, photosynthetic activity will be reduced affecting the seagrass growth.
- **Limpets and chitons.** These species live in intertidal areas as they need to be exposed during low tide. An increase in sea level will cause the death of these species particularly if their habitat-rock are lost due to coastal retreat.

The semestral monitoring of these particular species are conducted through Biodiversity Monitoring System (BMS). The ways to observe/measure these key indicators include a population survey, ocular field inspection, and rapid assessment techniques. There are established specific observation points for these species. During the observation, all flora and fauna species observed in the site are recorded as well as the threats observed in the area.

For the mangroves and seagrasses, baseline data on their spatial distribution, composition, and density/population were already established through the habitat assessment conducted on CY 2019 and CY 2020, respectively.

11.5. Data Collection, Analysis and Reports

The data collection methods to be used for the different levels of results have been identified in the previous sections. In summary, they consist of:

- Review/collection from secondary sources such as SIPLAS PAMB meeting documentation, reports and records of DENR-PENRO, SIPLAS PAMO, nine (9) LGUs, LGU-DRRMCs, water utilities, Peoples Organizations (POs), and relevant line agencies.
- Key informant interviews (KII) and Focus Group Discussions (FGDs) to generate from local communities qualitative information that will supplement or validate reports and observations. The assessment of the management effectiveness of MPAs and MPA networks, and of the METT will utilize the FGD method.
- Small and rapid household surveys to determine perceived benefits of target beneficiaries.
- Mapping and map overlay analysis using Geographic Information System (GIS)
- Site validation to physical check the presence/status of a reported accomplishment/event. A photo-documentation should be part of this activity.
- Site observations and measurements for the monitoring of indicator species such as BMS. For coastal and marine areas, this will include coral reef monitoring and Fish Visual Census (FVC). A photo-documentation (geo-tagged photos) should also be part of this activity.

Most of the information on the output indicators are based on secondary sources. Most data collection are done quarterly. Analysis and reporting may be synchronized with the regular SIPLAS PAMB Executive Committee and *En Banc* meetings. Progress report of plan implementation are made part of the PAMB meeting agenda. As had been indicated in previous sections, the analysis of data at the output level will mainly entail the comparison between targets and accomplishments, between accomplishments and time elapsed, and between accomplishments and costs, with explanations for performance delays or shortfalls.

A combination of quantitative and qualitative data collection methods is suggested for outcomes. The frequency of data collection differs among the indicators depending on how fast or long it will take to realize the outcome or of the information which will be basis for assessing change. While some data collection will be done quarterly, the analysis and reporting on specific outcomes are on semi-annual or annual basis. A year-end report that will capture all the output and outcome indicators should be produced for the SIPLAS PAMB.

The analysis of the outcomes will mainly involve comparison measurements or conditions at a specific time during the implementation with the measurement or condition at the beginning of implementation. It will also show temporal and spatial trends which can be reflected in graphs and maps. Baseline data are already established at the early part of the implementation. The analysis examines the effects of any changes in external factors (i.e., those beyond the control of SIPLAS PAMB, PASu, and LGUS) on the timeliness and magnitude of the results. The analysis lead to the rethinking/redesign of specific strategies or activities and identified successful practices or processes that are considered for dissemination or replication elsewhere.

The ongoing evaluation that is proposed to be done at the middle and end of the plan period will look into the continuing relevance, effectiveness and sustainability of adaptation measures. This will be complemented with an analysis of the measurements or observations

on indicator species that are sensitive to climate changes. This evaluation activity is an opportunity to involve the academe as a third party evaluator or member of the evaluation team. The conduct of the evaluation activity will have to be organized and spearheaded by the BMB.

The main users of the information generated would be the SIPLAS PAMB, SIPLAS PAMO, and the LGUs who are the primary implementers of the planned interventions. The reports to them should be in a format that will be useful for decision-making, planning and budgeting, making use of pictures, maps and charts, when applicable. Reports to SIPLAS PAMB should highlight the most important findings and present corresponding options for those requiring PAMB actions.

The monitoring and evaluation checklist guide for the SIPLAS PAMO and DENR PENRO are summarized in Table 100, for the Local Government Units are in Table 101, and for the BMB/DENR Central in Table 102.

Table 101. Monitoring and Evaluation Checklist/Data Collection Guide for SIPLAS PAMO and DENR PENRO

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
OUTPUT LEVEL					
A. Strict Protection Zone					
1. Local Conservation Areas with approved management plans	Types of habitats with management plans	PAMO Office	Document review (approved plans)	Annually	Annually
	Area (in hectares) covered by approved management plans		On-site monitoring	Quarterly	Quarterly
2. Water production areas with approved management plans	Identified and delineated water production areas with PAMB approved management plans	PAMO Office	Document review On-site assessment Monitoring	Annually Once Quarterly	Annually Quarterly
3. Cave classified as Class I with approved management plans	Types of cave with PAMB approved management plans	PAMO Office	Document review-	Annually	Annually Quarterly
	Existing cave covered by approved management plans		On-site assessment	Once	
			On-site Monitoring	Quarterly	
4. Inland Wetland Conservation with approved management plan	Types of wetland with PAMB approved management plans	PAMO Office	Document review	Annually	Annually Quarterly
	Identified and delineated wetland with management plans		On-site assessment	Once	
			On-site Monitoring	Quarterly	
5. Marine protected areas (MPA) established	Number of MPAs meeting the indicators and benchmarks for Level 1 management effectiveness	PASu Office, municipal and barangay LGUs	MEAT FGDs; document review (MPA ordinances, management plans)	Annually	Annually
	Area (in hectares) of MPAs established				
6. Active enforcement bodies	SIALEC operationalized trained and deputized	PAMO, partner NGAs and NGOs	Document review (MOU, operation report, training reports, deputation order)	Quarterly	Quarterly

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
7. Areas under rehabilitation	Areas within natural forests, old growth mangroves and coral reefs within MPAs that are undergoing rehabilitation and have been rehabilitated.	PASu Office and municipal and barangay LGUs	Field monitoring; review of monitoring reports	Six-monthly/ annually	Six-monthly/ annually
6. No-build zones (in high hazard areas) established	No-build zones delineated and declared as such in the LGU zoning ordinance or other local ordinance	Municipal LGU	Document review (CLUP, ordinance)	Six-monthly/ annually	Six-monthly/ annually
B. Multiple Use Zones					
1. Tenured areas with approved management plans	Tenured areas (in hectares) with DENR/PAMB approved management plans	DENR PENRO/ PASu Office	Document review (management plans)	Quarterly	Quarterly
2. Water production areas with approved management plans	Identified and delineated water production areas with PAMB approved management plans	PASu Office, water utilities, establishments with own water systems (e.g., hotels, resorts), municipal and barangay LGUs	Document review (management plans)	Quarterly	Quarterly
	Area (in hectares) covered by approved management plans	PASu Office, water utilities, establishments with own water systems (e.g., hotels, resorts), municipal and barangay LGUs	Document review (management plans)	Quarterly	Quarterly

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
3. Areas under productive development	Areas (in hectares) under development as agroforestry farms, tree plantations, perennial crop plantations, orchards, and fuelwood lots by PACBRMA, individual/ private land owners	PAMO-SIPLAS, municipal and barangay LGUs, tenure holders	Field monitoring; review of monitoring reports	Six-monthly/ annually	Six-monthly/ annually
4. Eco-tourism areas with approved management and business plans	Eco-tourism areas (by type) with PAMB-approved management and business plans	PASu Office, Municipal Tourism Officers	Document review (management plans)	Quarterly	Quarterly
5. Disaster risk reduction plans approved	Approved DRRM plans for LGU and communities or barangays in SIPLAS that are highly vulnerable to landslides	Municipal LGUs, MDRRMCs	Document review (LGU and community or barangay DRRM plans)	Quarterly	Annually
C. Institutional Strengthening and Governance					
1. Functional PAMB	Active PAMB with adequate funding and secretariat support	SIPLAS PAMO	Document review (budgets, minutes of meetings)	Quarterly	Annually
	Attendance of members or designated alternates in PAMB meetings (in % of meetings per year)	SIPLAS PAMO	Document review (attendance record)	Quarterly	Annually
	Continuing education program for PAMB members	SIPLAS PAMO	Document review (activity design and report)	When activity is held	Annually
2. Active PAMB Sub-Committees	Sub-committees formed and regularly holding meetings to address concerns relevant to the sub-watershed	SIPLAS PAMO	Document review (minutes of meeting)	Quarterly	Quarterly

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
	Annual average percent attendance of members or designated alternates in cluster committee meetings	SIPLAS PAMO	Document review (attendance record)	Quarterly	Quarterly
3. Signed PAMB agreements with stakeholders	Number of agreements between PAMB and stakeholders (MOA, MOU)	PAMO-SIPLAS, municipal LGUs, NGOs and NGAs	Document review (agreements)	Quarterly	Quarterly
	MPA network agreement among LGUs and with PAMB signed				
4. Governance enhanced and harmonized policies, procedures and protocols	Policies, procedures and protocols reviewed and approved by PAMB	SIPLAS PAMO, PAMB	Document review (policies, procedures, protocols)	Quarterly	Annually
	Unified (inter-LGU) fishery ordinances enacted by individual LGUs	Municipal LGUs		Quarterly	Annually
5. User fee systems developed	User fee proposals/ schemes developed and approved by PAMB for implementation	PASu Office; municipal LGUs	Document review (user fee schemes)	Quarterly	Annually
6. IPAF management system established	Revenue inflows to IPAF per year (in Php); Utilization of IPAF per year (in Php)	PASu Office	Document review (IPAF records)	Quarterly	Quarterly
OUTCOME LEVEL					
A. Resource Management					
1. Effective management of critical terrestrial and coastal and marine habitats	Area of critical habitats that are under effective management, i.e., (a) management activities are carried out according to management plan; (b) incidence of illegal activities and forest fires reduced significantly; and (c) sightings and observations show	PAMO-SIPLAS; DENR-PENRO; municipal and barangay LGUs	Review of status reports on management plan implementation	Quarterly	
			Review of enforcement logbooks; forest fire reports	Monthly/quarterly	
			Geotagged photos	Monthly/quarterly	

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
	evidence of the presence of indicator species (flora and fauna)		Semi-structured/ key informant interviews; FGDs	Semi-annual/ annual	
			Modified BMS (which may also use FGD, field diary, transect walk and photos)	Quarterly/semiannual/annual (depending on characteristics and behavior of indicator species)	
			Monitored BAMS sites	Every 5 years	Every 5 Years
	Area of MPAs under effective management i.e., (a) MPA management effectiveness level is at least Level 2, (b) incidence of illegal fishing and harvesting practices reduced significantly, (c) sightings and observation show evidences of the presence of indicator species (flora and fauna) within and outside the MPA, and (d) observations and feedback that indicate improving fish abundance or fish catch	PAMO-SIPLAS; municipal and barangay LGUs	MEAT FGDs	Annually	Semi-annually/ annually
			Review of enforcement logbooks, reports	Monthly/quarterly	
			Participatory coral reef monitoring; fish visual census	Annually	
			Perception surveys in benefitted barangays	Annually	
			Geotagged photos	Monthly/quarterly	
2. Improved vegetative cover	Percent of SIPLAS land area with good vegetative cover	DENR PENRO; MB/NAMRIA	Mapping and map overlay analysis (GIS)	Upon release of updated NAMRIA maps	Upon release of updated NAMRIA maps
	Area of closed canopy forest				
B. Socio-Economic Development					
1. Improved availability of water	Volume of water extracted for domestic water supply and small irrigation systems	Municipal and barangay LGUs, water utilities, establishments with own water	Gather from Water District records; other water systems	Semi-annual/ end of cropping season	Annually

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
		systems (e.g. hotels, resorts)			
2. Diversified incomes sources and employment opportunities	Area of productive agroforestry farms; number of households benefitted	Municipal LGUs, tenure holders	Annual on-site monitoring, small/ rapid survey, case studies of selected farmer cooperators, SEAT	Annually (i.e., each farm visited at least annually)	Annually
3. Reduce exposure of communities to threats of disasters from natural hazards and climate change	Disaster preparedness of LGU and vulnerable barangays/ communities	Municipal and barangay LGUs	Disaster preparedness checklist	Quarterly until barangays musts meet requirements; annually thereafter	Annually (before onset of typhoon season)
C. Governance					
1. Improved SIPLAS management effectiveness	Annual protected area management effectiveness rating	DENR 13, BMB	FGD with SIPLAS PAMB members, scoring	Every three years	Every three years
	MPA network effectiveness level	SIPLAS PAMO; Municipal LGUs	NEAT FGD	Annually	Annually
	Harmonized LGU CLUP and protected area management plan	SIPLAS PAMO; municipal LGUs	PASu-LGU joint review	Quarterly	Annually
	Increased resources/revenues generated for on site management activities	SIPLAS PAMO; municipal LGUs	Review of various documents and reports (budget documents, IPAF records, donations, user fees, PES, other revenue)	Quarterly	Semi-annually

Table 102. Monitoring and Evaluation Checklist/Data Collection Guide for Local Government Units (LGUs)

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
OUTPUT LEVEL					
A. Strict Protection Zone					
1. Water production areas with approved management plans	Identified and delineated water production areas with PAMB approved management plans	Water utilities, NIA, barangay LGUs	Document review (approved plans)	Quarterly	Quarterly
	Area (in hectares) covered by approved management plans				
2. Active enforcement bodies	Number of local enforcement teams formed, trained, deputized	Municipal and barangay LGUs	Document review (memo orders, training reports, deputation orders)	Quarterly	Quarterly
	Deployment of teams (in person-hours) per week or month		Document review (enforcement logbooks; field diaries)	Monthly	Quarterly
3. Marine protected areas (MPA) established	Number of MPAs meeting the indicators and benchmarks for Level 1 management effectiveness	Municipal and barangay LGUs	MEAT FGDs; document review (MPA ordinances, management plans)	Annually	Annually
	Area (in hectares) of MPAs established				
4. No-build zones established in hazard areas	No build zones delineated and declared as such in LGU zoning ordinance (or other local ordinance)	Municipal LGU	Document review (CLUP/zoning plan and/or ordinances)	When enacted/ issued by LGU	When enacted/ issued by LGU

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
B. Multiple Use Zones					
1. Areas under productive development	Areas (in hectares) under development as agroforestry farms, orchards, perennial crop plantations and fuelwood lots by barangay LGUs	Municipal and barangay LGUs	Field monitoring; review of monitoring reports	Six-monthly/ annually	Six-monthly/ annually
2. Water production areas with approved management plans	Identified and delineated water production areas with PAMB approved management plans	Water utilities, NIA, barangay LGUs, private water systems/wells	Document review (management plans)	Quarterly	Quarterly
	Area (in hectares) covered by approved management plans				
3. Eco-tourism areas with approved management and business plans	Eco-tourism areas (by type) with PAMB-approved management and business plans	Municipal LGU	Document review (management plans)	Quarterly	Quarterly
4. Community-based enterprises established	Potential community-based agriculture, fisheries and tourism based enterprises with business plans	Municipal and barangay LGUs, POs	Document review (business plans)	Quarterly	Quarterly
	Agri and fisheries-based processing and tourism based enterprises that are financed	Municipal and barangay LGUs, POs	Document review (business registration)	Quarterly (at registration of business)	Annually
	Total public and private investments (in pesos) in community-based enterprises	Municipal and barangay LGUs, POs	Document review (business registration report)	Annually	Annually
5. Disaster risk reduction plans approved	Approved DRRM plans for LGU and communities or barangays in PPLS that are highly vulnerable to landslides	Municipal and barangay LGUs, MDRMC	Document review (LGU and community or barangay DRRM plans)	Quarterly	Annually
	Annual budget allocation for DRRM by municipal and barangay LGUs				

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
C. Institutional Strengthening and Governance					
1. Signed PAMB agreements with stakeholders	Number of agreements between PAMB and municipal and barangay LGUs	Municipal LGUs	Document review (agreements)	Quarterly	Quarterly
	MPA network agreement among LGUs and with PAMB signed				
2. Governance enhanced and harmonized policies, procedures and protocols	PAMB-approved policies, procedures and protocols translated into LGU ordinances or integrated in LGU plans	Municipal LGUs	Document review (PAMB policies, procedures, protocols in LGU ordinances/ plans, unified ordinances)	Quarterly	Annually
	Unified (inter-LGU) fishery ordinances enacted by individual LGUs				
3. User fee systems developed	User fee proposals/ schemes developed and approved by PAMB for implementation	Provincial and municipal LGUs	Document review (user fee schemes)	Quarterly	Annually
OUTCOME LEVEL					
A. Resource Management					
1. Effective management of critical terrestrial and coastal and marine habitats	Area of critical habitats that are under effective management: (a) management activities are carried out according to management plan; (b) incidence of illegal activities and forest fires reduced significantly; and (c) sightings and observations show evidence of the presence of indicator species (flora and fauna)	Municipal and barangay LGUs	Review of enforcement logbooks; forest fire reports	Monthly/quarterly	Semi-annually/ annually
			MEAT FGDs	Annually	

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
	Area of MPAs under effective management i.e., (a) MPA management effectiveness level is at least Level 2, (b) incidence of illegal fishing and harvesting practices reduced significantly, (c) sightings and observation show evidences of the presence of indicator species (flora and fauna) within and outside the MPA, and (d) observations and feedback that indicate improving fish abundance or fish catch	Municipal and barangay LGUs	Review of enforcement logbooks, reports	Monthly/quarterly	Semi annually/ annually
			Participatory coral reef monitoring; fish visual census	Annually	
			Perception surveys in benefitted barangays	Annually	
			Geotagged photos	Monthly/quarterly	
B. Socio-Economic Development					
1. Improved availability of water	Percent of population of SIPLAS barangays with access to water supply	Municipal and barangay LGUs	Inventory of water systems per barangay	Annual updating of inventory	Annually
	Number of SIPLAS barangays with reported occurrences of water related health problems	Municipal and barangay LGUs	Water quality monitoring Top ten morbidity reports	Annually	Annually
	Areas of farms irrigated by small irrigation systems	Municipal LGUs	Derive from MAO record	End of cropping season	Annually
	Volume of water extracted for domestic water supply and small irrigation systems	Municipal and barangay LGUs, water utilities, other major users, irrigators association	Derive from Water District, MAO and water users records	Semi-annual/end of cropping season	Annually
2. Diversified incomes sources	Number of employed in community-based tourism services	Municipal and barangay LGUs, POs	Derive from records of PO operations		Annually

Results	Indicators	Data Sources	Methods of Data Collection	Frequency of Data Collection and Recording	Frequency of Reporting
and employment opportunities	Number of operational/viable community enterprises; number of members employed	Municipal and barangay LGUs, POs		Quarterly (but collect monthly employment data)	
	Area of productive agroforestry farms; number of households benefitted	Tenure holders, barangay LGUs	Annual on-site monitoring and mapping of agrof sites	Each farm visited at least annually	Annually
3. Reduce exposure of communities to threats of disasters from natural hazards and climate change	Disaster preparedness of LGUs and vulnerable barangays/ communities	Municipal and barangay LGUs	Disaster preparedness checklist	Quarterly until barangays meet requirements/musts; annually thereafter	Annually (before onset of typhoon season)
	Value of damages to property, infrastructure and livelihoods of events related to natural hazards and climate change	Municipal LGU/MDRRMC	Physical inspection and assessment; derive from DRRMC reports	Immediately after occurrence of disaster or calamity	1-3 months after occurrence of disaster or calamity
C. Governance					
1. Improved PPLS management effectiveness	MPA network effectiveness level	Municipal LGUs	NEAT FGD	Annually	Annually
	Harmonized LGU CLUP and PA management plan	Municipal LGUs	PASu-LGU joint review	Quarterly	Annually
	Increased resources/revenues generated for on site management activities	Municipal LGUs	Review of various documents and reports (budget documents, user fee collection, donations, investments, PES, other revenues)	Quarterly	Semi-annually

Table 103. Monitoring and Evaluation Checklist/Support Requirements from BMB/DENR Central

Results	Indicators	BMB Support to PPLS M and E
OUTPUT LEVEL		
A. Institutional Strengthening and Governance		
1. Functional PAMB	Active PAMB with adequate funding and secretariat support	BMB and DENR Planning and Budget Offices to make sure that PAMB is adequately funded and PASu has adequate/ qualified staff to provide secretariat support
	Continuing education program for PAMB members	BMB to assist PASu develop continuing education program for PAMBs, and provide funding
OUTCOME LEVEL		
Resource Management		
1. Effective management of critical terrestrial and coastal and marine habitats	Area of critical habitats that are under effective management: (a) management activities are carried out according to management plan; (b) incidence of illegal activities and forest fires reduced significantly; and (c) sightings and observations show evidence of the presence of indicator species (flora and fauna)	BMB to spearhead the development of BMS methodology that is suitable to the characteristics of habitats and behavior of selected indicator species for PPLS. The BMB will have to provide guidance and resources for the design of the modified BMS and the training of those who will undertake it. A biodiversity specialist/biologist may need to be tapped.
2. Improved vegetative cover	Percent of PPLS land area with good vegetative covers	BMB to coordinate with FMB/NAMRIA to provide PPLS access to latest vegetative cover maps of NAMRIA and assist in the analysis of forest cover data.
	Area of closed canopy forest	
Governance		
1. Improved PPLS management effectiveness	Annual protected area management rating	BMB to review the METT framework and indicators and consider its refinement so these give more emphasis to key outputs and results and less to inputs and processes.
IMPACT LEVEL		
1. Increased resilience of ecosystems and communities to threats of climate change	Continuing relevance, effectiveness and sustainability of climate change adaptation measures	<p>BMB to organize the conduct of a third party assessment using the V=f(E, S, AC) framework and suggested scope of the evaluation process.</p> <p>BMB to develop the methodology, with support from a biodiversity specialist/ biologist, for the monitoring of indicator species for climate effects/resilience and analysis/interpretation of data. Some indicator species are identified in the M and E plan.</p>

11.6. SIPLAS Database

A SIPLAS database will have to be designed to contain all the quantitative and qualitative data, maps, photos, and document files that will be collected periodically from various sources. The database will basically consist of pre-formatted spreadsheets or summaries for various data sets, and systematically organized and properly labelled maps, geo-tagged photos, documents files (e.g., agreements, policies) and other reference materials. These should as much as possible be in digital format for easy access, sorting, processing and storage.

Among the important data sets that should be maintained as part of the database are:

- a. Meteorological information collected mainly from PAGASA or a hydromet system located in SIPLAS. Arrangements with PAGASA will have to be formalized in order to gain access to their data holdings on rainfall, temperature, weather disturbances and other relevant data.
- b. Occurrence of climate related event (typhoons, storm surges, floods, droughts) in SIPLAS and in the entire CARAGA Region; period of occurrence; intensity; areas affected; households affected; types and value of damages to property, crops/livelihood, and infrastructure, loss of lives.
- c. Forest cover data for SIPLAS to include area by type of land use/vegetative cover; and change from previous period. The data set should be linked to the relevant forest cover maps.
- d. Tenure holders in forestlands to include PACBRMA holders and number of individual farmer members; year of issuance of tenure agreement; expiration date; area under tenure; management plan/farm plans approved; and site development activities within tenured areas to include areas developed for agroforestry, tree or perennial crop plantations, orchards, fuel wood plantations.
- e. Site development activities in A and D area that will include areas developed for agroforestry, orchards, tree or perennial crop plantations, fuel wood plantations; year developed; and farmer co-operators.
- f. Marine protected areas with respective area; year of establishment and ordinance numbers; management organizations (i.e., barangay and/or PO); eco-tourism sites within them; annual MEAT results. A copy of the management plan for each MPA will be maintained in the database.
- g. Enforcement data (terrestrial and coastal) which should include, among others, the formation, training, deputation and deployment of upland and coastal enforcement teams; list of community volunteer-enforcers and deputized enforcers; number and types of violations reported; apprehensions and confiscations of illegally harvested forest and marine products; occurrences of forest fires and damages; and other reported illegal activities.
- h. Identified tourism and eco-tourism area with location; area covered; biodiversity significance; approved management plan; agreements signed; facilities available/for development; investments and annual operating costs; authorized operator of the facility and providers of tourism services; local employment generated; number of visitors per month; schedule of user fees; revenues generated and uses of such revenues; waste management system within tourism/eco-tourism site; and other protection and management programs under implementation.

- i. Biodiversity monitoring data (by indicator species) based on design of the BMS and the recommended frequency of the monitoring. This should include organized files of digital and geo-tagged photos.
- j. Inventory of water supply systems (all levels) within SIPLAS including the location of the water system/well/water pump; water sources; condition of water source/watershed; households served by the water system; condition of water system; operators of the system (water districts, cooperatives, association of water users, commercial/service establishments, barangay); volume of water extraction (for selected sources); and water quality problems encountered by communities.
- k. Small irrigation schemes; location of their water sources; area irrigated per cropping season; water extraction per cropping season (if available); and farmers benefitted.
- l. Community-based enterprises established including type of enterprises; location; year established/first registered; PO operator; investments for the enterprise and related infrastructure; input sources and markets; and employment generated.
- m. Integrated Protected Area Fund (IPAF) with other type of revenues generated (user fees, payments for environmental services) per year; other sources of revenues; and SIPLAS management activities funded by such revenues with corresponding amounts.
- n. Management plans approved by SIPLAS PAMB by type of area (critical habitat, water source, tenured area, eco-tourism, etc); date approved; period of plan; and area covered by the management plan. Copies of the management plans will be made part of the database.
- o. Agreements signed with SIPLAS PAMB; purpose of agreement; parties to the agreement; date signed; key agreement provisions; and expiration date, if any.
- p. Policies, decisions/resolutions and other issuances of SIPLAS PAMB to include subject matter; date of issuance; effective date; important provisions; related ordinances issued by the LGU; date of ordinance; effective date; and key provisions.
- q. Support projects implemented in SIPLAS such as those projects funded by other donors (e.g., Ecotown, B+WISER) and national ENR (e.g., National Greening Program or NGP), social services and rural infrastructures (e.g., Bottom-Up Budgeting Program) programs. This should provide a list of these projects and indicate the type of project; funding source; amount of funding implementor; location of project; timeframe; and O and M arrangements.
- r. New national, regional and provincial policies and issuances that will have implications on the SIPLAS management. This may include relevant bills pending in Congress,

A back-up file of these data sets should always be maintained in an external drive. DENR PENRO will be encouraged to maintain similar data files as a data security measure.

Suggested and illustrative formats to help organize data collection and recording are part of the discussion on the outcome indicators. These will be considered in the design of the databases.

The set of maps will include all the thematic maps contained in the management plan plus the approved SPZ and MUZ maps. As new vegetative maps are released by NAMRIA, an updated vegetative map will be included in the database. The other maps should also be updated as new information is made available. Both the shape files and the JPEG format of the maps will be kept in the database. A back-up file should also be maintained in an external drive

11.7. Monitoring and Evaluation Organization and Funding

The SIPLAS PAMO will be the key responsibility center for monitoring and evaluation. It will be supported by the Local Working Group (LWG) which is composed of LGU staff representing the planning and/or environmental offices of the LGUs. The SIPLAS PAMO will be the depository of all data generated through various monitoring and evaluation activities. The concerned LWG members will be responsible for providing the SIPLAS PAMO the data that are required from their LGUs as shown in Table 88. The SIPLAS PAMO and the LWG will agree on activities that will have to be done jointly by them or with other stakeholders.

The proposed staffing for the SIPLAS PAMO should provide for staff who can be trained and assigned to handle the following key monitoring and evaluation functions:

- a. Organize the overall data collection plan based on the monitoring and evaluation plan and the structure/format of the data collection forms;
- b. Orient members of the LWG on the data requirements for various results and work out with them a more detailed and specific data collection plan;
- c. With the LWG, establish the baseline data/condition for the different output and outcome indicators;
- d. Collect data from concerned LWG members and other data sources; record in appropriate data forms; maintain the SIPLAS database;
- e. Coordinate with the DENR Regional Office for the proposed customization of the BMS and METT (process and content), and for the conduct of the modified BMS and METT;
- f. At the end of the quarter/semester/year, process the data and generate the information for inclusion in reports;
- g. Organized quarterly LWG meetings for discussion of processed information and for preparation of report (important findings, analysis and options for action) for presentation to SIPLAS PAMB;
- h. Prepare report presentation for PAMB (using graphs, maps, photos). The PASu or chairperson of the LWG should present the report;
- i. Disseminate to all concerned the decisions and actions of the PAMB related to the monitoring and evaluation report for appropriate action;
- j. With the LWG, organize feedback sessions with local communities on the findings of the report; and
- k. Annually, prepare and submit to the SIPLAS PASu (for submission to the PAMB) the proposed budget for the monitoring and evaluation.

It is important that the monitoring and evaluation is allocated a budget. Funding will be required for the following:

- a. Travel for data collection and field validation activities
- b. Costs for the conduct of the modified BMS and underwater assessments
- c. Costs for the KII and FGDs, feedback sessions
- d. Acquisition and updating of maps
- e. Procurement of equipment (computers, tablets with GIS capability)
- f. Basic supplies
- g. Reproduction costs

Major data collection activities that will require regular budget allocation from DENR and LGUs are the conduct of the BMS, METT, MEAT and underwater surveys. The budget will be for the training of those who will undertake the BMS, purchase of basic equipments

(identified in the respective manuals), the actual conduct of the field activities, and the groups discussions and FGDs for the METT and MEAT.

The BMB will have to provide the resources for the more specialized assessment on climate change resiliency. As described in Chapter III, this could be a third party evaluation of the relevance, effectiveness and sustainability of climate change adaptation measures in SIPLAS including the field monitoring of indicator species for climate change resilience.

The LWG of SIPLAS may be called upon to provide support to monitoring and evaluation. LGU members of the LWG will be made responsible for information coming from their respective LGUs and assist the PASu in organizing the data. The LWG may be convened periodically (e.g., quarterly) for the analysis of gathered data and a discussion of monitoring and evaluation findings prior to the preparation of the formal monitoring and evaluation report to the PAMB.

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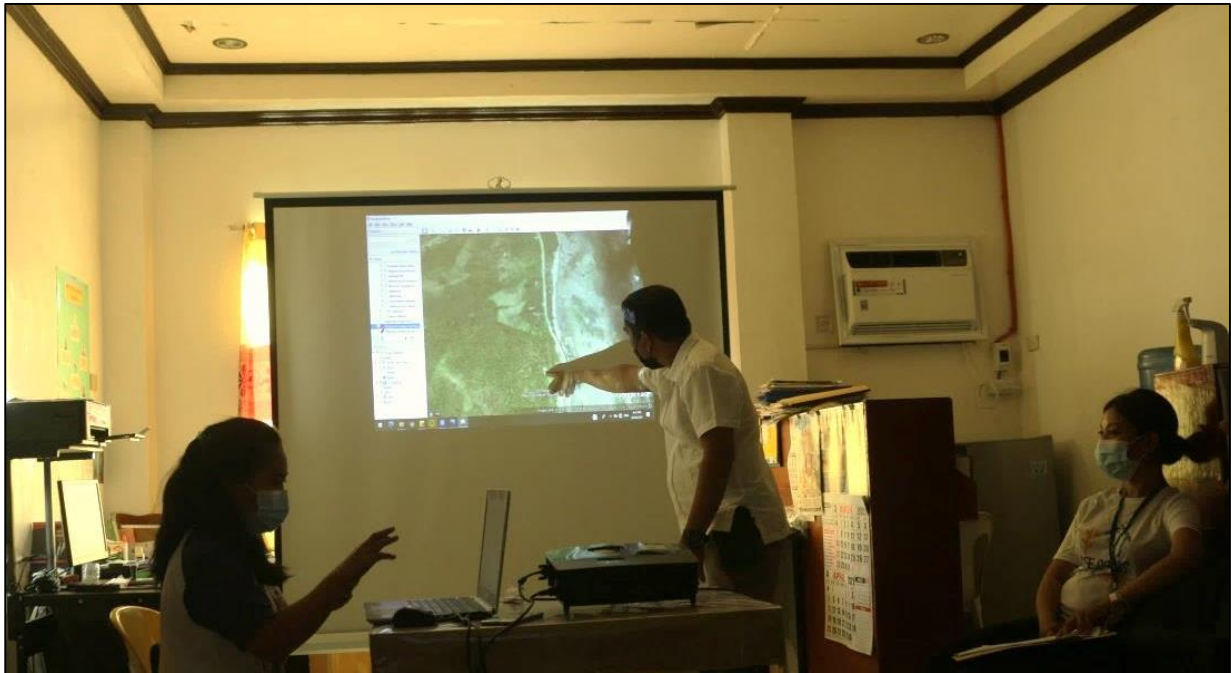
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ANNEXES

ANNEX 1

Photo Documentation during public consultation with different stakeholders in SIPLAS

MUNICIPALITY OF BURGOS



MUNICIPALITY OF DAPA



MUNICIPALITY OF GENERAL LUNA



MUNICIPALITY OF PILAR



MUNICIPALITY OF SAN BENITO



MUNICIPALITY OF SANTA MONICA



MUNICIPALITY OF SOCORRO



MUNICIPALITY OF DEL CARMEN



MUNICIPALITY OF SAN ISIDRO



ANNEX 2

Strength, Weakness, Opportunities and Threat (SWOT) Analysis

SWOT ANALYSIS

	Strength	Weaknesses	Opportunities	Threats
Governance	Supportive LGUs	Governance: Weak of implementation on fisheries ordinance; LGU support to fisheries sector	Opportunity to have a concrete financial programs/ projects in PAMB with the IPAF (Integrated Protected Area Fund)	
	Functional Committees of PAMB	No anti littering campaign (Siargao island wide)- tie up with Dep Ed	Opportunity to enhance law enforcement (Maritime, PNP, Coast Guard)	
	Presence of external partners (NGO, NGA)	Weakness in enforcing coastal easements especially in private projects that cannot be easily inspected. Ex. Current construction of large seawall and reclamation of portions of seashore near Don Paulino, Dapa.	Funding from GAA and other downloaded funds from central office and other agencies	
	Synergistic relationship among leaders	Conflict of Municipal over SIPLAS water	Opportunity to enhance the image of Siargao as a Protected Area through public advertising with the collaborative efforts from DICT, DOT Caraga & PAMB	
	Peace and Order	Conflicts of NIPAS Act with economic / practical development of Siargao. Ex: Land conversion issues with DAR vs Actual use.	Coordination with the academe regarding on the scientific studies that serves as legal basis supports to the policies in SIPLAS	
	Provision of IEC materials focus on conservation	weak of implementation due to prioritization and funding support problem		

	Strength	Weaknesses	Opportunities	Threats
Governance	Social Marketing Strategies	Conflicts of NIPAS Act with economic / practical development of Siargao. Ex: Land conversion issues with DAR vs Actual use.		
		Governance: Weak policy recommendation		
		It should be noted that there must also be Water Use Zoning as it is now CLWUP		
		Comment from Rare: Weakness: CLWP Of LGUs not comprehensive wherein it only covers land use		
		Non implementation of collection of fees (entry points)		
		Lack implementation of Solid Waste Management Plans of the municipalities		
		Weak MPA Network		
		Weak implementation of passed PAMB resolutions		
		Lack of alternative means for stakeholders to attend activities such as this		
		Alignment of Local Government Codes and ENIPAS act		

	Strength	Weaknesses	Opportunities	Threats
Governance		Lack of policy recommendation on land conversion		
		No hazard detection and warning communications		
		Weak implementation of disaster prevention and mitigation strategies		
		No PAMB Resolution focus on Coral bleaching emergency policies		
		Governance: Weak of implementation on fisheries ordinance; LGU support to fisheries sector		
		No anti littering campaign (Siargao island wide)- tie up with Dep Ed		
		Weakness in enforcing coastal easements especially in private projects that cannot be easily inspected. Ex. Current construction of large seawall and reclamation of portions of seashore near Don Paulino, Dapa.		
		Conflict of Municipal over SIPLAS water		
		Conflict of Municipal over SIPLAS water		
		Conflicts of NIPAS Act with economic / practical development of Siargao. Ex: Land conversion issues with DAR vs Actual use.		

	Strength	Weaknesses	Opportunities	Threats
Governance		weak of implementation due to prioritization and funding support problem		
		Conflicts of NIPAS Act with economic / practical development of Siargao. Ex: Land conversion issues with DAR vs Actual use.		
		Governance: Weak policy recommendation		
		It should be noted that there must also be Water Use Zoning as it is now CLWUP		
		Comment from Rare: Weakness: CLWP Of LGUs not comprehensive wherein it only covers land use		
		Non implementation of collection of fees (entry points)		
		Lack implementation of Solid Waste Management Plans of the municipalities		
		Weak MPA Network		
		Weak implementation of passed PAMB resolutions		
		Lack of alternative means for stakeholders to attend activities such as this		
		Alignment of Local Government Codes and ENIPAS act		

	Strength	Weaknesses	Opportunities	Threats
Governance		Lack of policy recommendation on land conversion		
		No hazard detection and warning communications		
		Weak implementation of disaster prevention and mitigation strategies		
		No PAMB Resolution focus on Coral bleaching emergency policies		
Ecological	Presence of Major Ecosystems and habitat	Watershed Management Plan should be developed	Opportunity to analyze water samples through the Water Testing Laboratory with Lab experts in SCFSFF with DOST Caraga.	Natural hazard (climate change, storm surge, etc.)
	Abundance of natural resources that provides food security	Outdated Upland/Watershed Management Plans	Additional more MPAs serve as Strict Protection Zones	Sea level rise due to continuous increase temperature and reclamation of bodies of water
	Aesthetic Characteristics of the Island	No protection against coastal erosion	Conduct more scientific researches focus on biodiversity profile of Siargao Island	Water and food supply shortage
	Presence of important endemic species (Note- other data to gather (SSCT, SIKAT, BFAR)	No on and off season for fishing	Strengthening the Protection of the remaining ultramafic forests in Siargao	Salt water intrusion, since Siargao has no large surface water source
	Established MPAs	Lack of comprehensive pollution prevention measures from land based sources		Potential mass construction of high rise building due to

	Strength	Weaknesses	Opportunities	Threats
Ecological				scarcity of land/space
	Largest Contiguous mangrove forests	Lack of emergency plans and rehabilitation strategies		Biodiversity loss due to the destruction of natural habitat
	High Biodiversity Index (data: follow up SSCT DC, BFAR, SIKAT)	lack of sewage treatment plants- close coordination with water supplier		Uncontrollable disturbance to the natural habitat due to increased air, land, and marine traffic
	Presence of EDGE and threatened species	Occurrence of sinkholes caused by too much extraction of groundwater		Geo hazard (earthquakes)
	*Presence of virgin islands and scenic views			
	Home of the important flora and fauna species			
	fresh air and clean water			
	Passage way of migratory species (Dolphins, birds, etc.)			
	Existing facilities (sports complex, convention center, Cloud 9 Boardwalk, air and sea ports, Eco-CR, etc.)	Climate Change Adaptation in terms of infrastructures i.e. Green-Grey Building Designs	Opportunity to showcase the other tourism sites in Siargao with the strong provincial support	unexpected pandemic health issue that affects the economy

	Strength	Weaknesses	Opportunities	Threats
Economic	High-End Accommodation (Note: Update the latest accommodation from GL and Dapa)	Several establishments did not follow the ECC protocols	Improve the livelihood of the Siargaonons with the Shared Survival Fund from Department of Trade & Industry.	
	Top 5 Best surfing site/destination in the world		Agricultural program (<i>Hardin ng Pagbabago</i> , agri-youth)	
	Local Livelihood/enterprises (Note: update the list)		Double the impact of providing livelihoods and extensions to the coastal and upland communities with the help of active Non-Government Organizations (SIKAT, Rare, SIBOL, <i>Harden ng Pagbabago</i> , Agri-Youth, Espoir School of Life, etc.)	
Economic	Local Products (Pan de Surf, Pan de Coco)		Enhance the socio-economic profile of Siargao with National Economic and Development Authority (NEDA)	
	Abundant of tourism spots (update list of tourist spot c/o STOA and concern LGUs)		More International and Domestic private sectors supports economic development of Siargao	
	Game-fishing Mecca		Transforming Resilience, Inclusive, and Sustainable Tourism (TouRIST) Program	
	Serve as Host for International Events (Surfing, Game-fishing)			

	Strength	Weaknesses	Opportunities	Threats
<div>Social</div> <div>Social</div>	Strong sense of Pride (Siargaonon)	Few knowledge and information on awareness on fishing laws for stakeholders	Knowledge management center in the advances for agriculture and fisheries with the Siargao Climate Field School for farmers and Fisherfolks from Climate Change Commission	Gradual diminishment of local culture which is influence by the immigrant foreigners (culture shock)
	Accredited to PSA Surfers (Trained Surf Instructors, PO: SISA)	Weak support on socio-eco program for violators of coastal and upland laws	Enhancing the research culture in Siargao with the academic institutions (UPLB, UST, DLSU, NYU)	
	Hospitable people of Siargaonons		Strengthen research culture of SIPLAS with DOST (Department of Science & Technology)	
	Accredited People's Organization (Note: update the list of accredited POs)		Fisherfolks tools & materials distribution and other trainings programs from BFAR (Bureau of Fisheries & Aquatic Resources)	
	2 municipal Fisherfolk Federation formed (Del Carmen and San Benito)		Opportunity to realize the plans and initiative in the grass root level with the active and supportive participation of accredited People's Organization in Siargao	
	Several local communities had already aware about Siargao as PA			
	Local communities serve as tour guides			

ANNEX 3

Photo-documentation of Mangrove Species Identified in SIPLAS

Mangrove Species Identified in SIPLAS



Saging-saging (*Aegiceras corniculatum*)



Miapi (*Avicennia alba*)



Bayabason (*Avicennia marina*)



Api-api (*Avicennia officinalis*)



Bungalon (*Avicennia rumphiana*)



Maragomon (*Brownlowia tersa*)



Busain (*Bruguiera cylindrica*)



Pototan (*Bruguiera gymnorhiza*)



Langarai (*Bruguiera parviflora*)



Karakandang (*Bruguiera sexangula*)



Tungog (*Ceriops tagal*)



Baras-baras (*Ceriops zippeliana*)



Bakhaw lalaki (*Rhizophora apiculata*)



Bakhaw babae (*Rhizophora mucronata*)



Bakhaw bato (*Rhizophora stylosa*)



Dungonlate (*Heritiera littoralis*)



Tabao (*Lumnitzera littorea*)



Culasi (*Lumnitzera racemosa*)



Nipa (*Nypa fruticans*)



Bantigi (*Pemphis acidula*)



Nilad (*Scyphiphora hydrophyllacea*)



Pagatpat (*Sonneratia alba*)



Pedada (*Sonneratia ovata*)



Tabigi (*Xylocarpus granatum*)



Piag-ao (*Xylocarpus moluccensis*)

ANNEX 5

Detailed list of unclassified caves and their location and characteristics in Siargao Island Protected Landscape and Seascape (SIPLAS)

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
GENERAL LUNA									
1	General Luna	Consuelo Cave	Brgy. Consuelo	9.803248	126.10622	The entrance is walking distance from the National Highway	A&D Titled Land	1.Guano extraction 2. Visited by tourist 3. 1/2 km from the highway 4. The Cave is about 1km. Long 5. Diff. entrance (Brgy. Consuelo) and exits (Brgy. Mahayahay & Brgy. Corazon) 6. Shows Mining Manifestation	For further assessment
2	General Luna	Corazon Cave	Brgy. Corazon	9.80512	126.109497	10 min. walk from highway	A&D Titled Land	1. Opening is about 7ft. wide	For further assessment
3	General Luna	Panilibon Cave	Sta. Cruz	9°50'19N	126°7'49E	3 minutes walked and 15 meters from the highway road	A&D Titled Land	1. Owned by Antipasado Family 2. Surrounded by Flora 3.The opening is about Vertical	For further assessment
4	General Luna	Bakwitan Cave	Sta. Cruz	9°49'59N	126°7'37E	500 meters walked from the highway	A&D Titled Land	1. Wide entrance 2. Wide Space in the inside 3. 50 meters from the entrance to exit	For further assessment
5	General Luna	Gamoton Cave	Sta. Cruz	52 P 184820 1088361		500 meters walked from the highway road	A&D Titled Land	1. The entrance is surrounded by flora 2. vertical cave 3. the entrance is small	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
6	General Luna	Boyobodha n Cave	Sta. Cruz	52 P 184561 1088487		25 minutes walked from the highway road to the entrance of the cave, 500 meters distance from the highway	A&D Titled Land	1. The entrance is surrounded by flora 2. vertical cave 3. the entrance is small	For further assessment
DAPA									
1	Dapa	Laksuhon Cave	Don Paulino	9.74898	126.088118	Walking distance from the national road	Coastline Area	1. 1 Opening for entrance and exit 2. No Fauna observed	For further assessment
2	Dapa	Mata Cave	Brgy. Corregidor	9.688682	126.085939	Along the shoreline	Coastline Area	2 Openings	For further assessment
3	Dapa	Digoy Cave	Brgy. 12 (Brgy. Catabaan)	9.769773	126.044608	30 mins' walk from the national highway	A&D	1. 2 openings (large: 10 m wide; small: 3 ft) 2. Shoes mining manifestation 3. Depth is about 30 m	For further assessment
4	Dapa	Paningning Vertical Cave	Brgy. 12	9.771215	126.041973	30 mins' walk from the national highway	A&D	1. Vertical cave 2. Only 1 person can pass in the opening, entrance is not safe	For further assessment
5	Dapa	Cave	Brgy. 12	9.768727	126.03586	30 mins' walk from the national highway	A&D	1. Vertical Cave 2. About 25 m long depth 3. Showed mining manifestation	For further assessment
6	Dapa	Cave	Brgy. 12	9.78543	126.03482	25 mins' walk from the national highway	A&D	Vertical Cave	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
7	Dapa	Basurahan Cave	Brgy. 12	9.76043	126.04975	along the road	A&D	Opening the cave serves as a landfill. It is said to have large center and 2 portals.	For further assessment
8	Dapa	Tinabunan Cave	Brgy. 12	9.766655	126.039072	3 m from the road	A&D	1. Vertical Cave 2. The community covered the cave with palm trunk to prevent accident	For further assessment
9	Dapa	Binaungan Cave	Brgy. 12	9.766403	126.039248	3 m from the road	A&D	1. Vertical Cave 2. Entrance is covered with coconut shell	For further assessment
10	Dapa	Sagbuton Cave	Brgy. 12	9.767298	126.038967	3 m from the road	A&D	1. Vertical Cave 2. Naturally covered with vegetation	For further assessment
11	Dapa	Lobo Cave	Sitio Lobo, Brgy 12	9.782045	126.037763	3 m from the road with bushy path	A&D	1. Small opening 2. Unvisited Cave 3. 3 openings can be observed, however, seems like separate caves based on observations from the openings. 4. center opening has an estimated depth of 6 m to the end of the cave with an estimated 13 ft in height.	For further assessment
12	Dapa	Vertical Cave	Sitio Lobo, Brgy 12	9.79147	126.036727	4 km from the highway	A&D	1. Vertical Cave 2. filled with water when raining 3. Cave is unsafe for unexperienced cavers	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
13	Dapa	Sitio Lobo Cave	Sitio Lobo, Brgy 12	9.791298	126.037297	4 km from the highway	A&D	1. Vertical Cave 2. filled with water when raining 3. Cave is unsafe for inexperienced cavers	For further assessment
14	Dapa	Sohoton Cave	Brgy. Osmeña	9.772772	126.074382	Motorcycle ride from the national highway of about 600 m and additional 300 m walk	A&D	1. Owned by Malahura Family 2. Former Water Source 3. Cave is under a tree 4. The opening is about 1 m in radius	For further assessment
15	Dapa	Cantilang Cave	Brgy. Osmeña	9.773493	126.078288	Motorcycle ride from the national highway of about 600 m and additional 150 m walk	A&D	1. Owned by Pamfila Tarife 2. Former water source 3. opening is about 1 m radius	For further assessment
16	Dapa	Kamangon Cave	Brgy. Osmeña	9.773192	126.078618	Motorcycle ride from the national highway of about 600 m and additional 150 m walk	A&D	1. Owned by Ms. Pamfila Tarife near Cantilang Cave 2. Opening is about 1 m vertical and 1 1/2 m horizontal	For further assessment
17	Dapa	Cliff Cave	Brgy. Osmeña	9.770873	126.087103	Motorcycle ride from the national highway of about 600 m and additional 1 1/2 km walk	A&D	1. Owned by Juan Tirantay 2. Unvisited Cave 3. About 25 m depth from the opening 4. serves as water downpour	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATION	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
18	Dapa	Bito Cave 1	Brgy. Osmeña	9.775013	126.080557	Motorcycle ride from the national highway of about 600 m and additional 10 m walk	A&D	1. Owned by Dr. Tiu 2. Opening is about 4m. Sq. and about 34 m in depth 3. Former Community Water source. 4. Opening is covered with vegetation	For further assessment
19	Dapa	Dayakit Cave	Brgy. Osmeña	9.777263	126.073702	about 600 m walk from the highway	A&D	1. Opening is about 1 1/2 m. sq. 2. water inside is intermittent.	For further assessment
20	Dapa	Bito Cave 2	Brgy. Osmeña	9.785878	126.093187	about 1 km walk from the highway	A&D	1. Opening is about 4 m. sq. 2. Cave has water inside and is utilized by the LGU as water source	For further assessment
21	Dapa	Dayakit Cave	Don Paulino	52 P 180648 1079195	The entrance is walking distance from the Diversion road by 100 meters	A&D Titled Land	1. Opening for entrance 2. Depth is about 30 ft.	For further assessment	
22	Dapa	Suksukon Cave	Don Paulino	52 P 80693 1079235	The entrance is walking distance from the Diversion road by 120 meters	A&D	1. Vertical Cave 2. 1 opening for entrance and exit	For further assessment	

NO	MUNICIPALITY	NAME OF CAVE	LOCATION	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
							3. Surrounded by flora		
23	Dapa	Lawon Cave	Don Paulino	52 P 180696 1079179	20 minutes walk from the diversion road	A&D	1. Vertical Cave 2. The entrance is small	For further assessment	
24	Dapa	Tadyahung an Cave	Don Paulino	52 P 181003 1079082	20 minutes walk from the diversion road	A&D Titled Land	01. Owned by Bravo Company 2. Near at surfing spot 3. Opening is covered with vegetation 4. Intermittent	For further assessment	
25	Dapa	Lugsungon Cave	Don Paulino	52 P 180862 1079299	10 minutes walked and 50 meters along the diversion road	A&D	1. Surrounded by flora 2. Owned by Bravo Company 3. The opening is about 1.5 m.sq.	For further assessment	
SAN BENITO									

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
1	San Benito	Pitugo Cave	Sitio Pitugo, Maribojoc	9.920133	125.943882	Cave along the community	Timberland	1. Dead Cave 2.Serves as the community evacuation center	Can be classified as class 3
2	San Benito	Pitugo Cave 1	Sitio Pitugo, Maribojoc	9.919938	125.943757	Cave along the community	Timberland	1. Dead Cave 2.Serves as the community evacuation center	Can be classified as class 3
3	San Benito	Pitugo Cave 2	Sitio Pitugo, Maribojoc	9.919785	125.943748	Cave along the community	Timberland	1. Dead Cave 2.Serves as the community evacuation center	Can be classified as class 3
4	San Benito	Cave	Sitio Campingga non	9.914712	125.93678	Cave along the community	Timberland	1. Dead Cave 2.Serves as the community evacuation center	Can be classified as class 3
5	San Benito	Cave 3	Sitio Campingga non	9.916345	125.93737	Cave along the community	Timberland	1. Dead Cave 2.Serves as the community evacuation center	Can be classified as class 3
6	San Benito	Cave 1	Sitio Campingga non	9.916415	125.937518	Cave along the community	Timberland	1. Dead Cave 2.Serves as the community evacuation center	Can be classified as class 3
7	San Benito	Cave 2	Sitio Campingga non	9.916795	125.93655	Cave along the community	Timberland	1. Dead Cave 2.Serves as the community evacuation center	Can be classified as class 3
8	San Benito	Sangat Cave	Sitio Campingga non	9.920322	125.93842	Sangat Island	Timberland	1. Parcel claimed by certain Bonifacio Alvarez	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								2. Abandoned by claimant, however, it is showed some development of the islet such as cottage above the opening cave 3. Cave underneath the cottage	
9	San Benito	Water Source Cave	Sitio Canhus, Brgy. Talisay	9.949298	126.020952	3 km away from the national road		1. Water source of the municipality 2. Cave with water inside 3. No fauna observed inside	For further assessment
10	San Benito	Taligrapo Cave	Brgy. Maribojoc	9.935255	125.968277	1 km from the brgy. Hall	Timberland	1. 2 openings 2. About 20 ft in depth 3. No fauna found inside	For further assessment
11	San Benito	Mag-adlaw Cave		9 57 32	126 1 58	500km from the brgy. Hall		Developed source of water	For further assessment
12	San Benito	Guyangan Cave		9 54 54	126 0 1	1 km from the brgy. Hall	Timberland	with beautiful blue water inside	For further assessment
13	San Benito	Ompong Cave	P-4 Maribujoc	9 55 56	125 57 47	Cave along the community	Timberland	1. Serve as the community evacuation center 2. Dead cave 3. large opening 4. no exit	For further assessment
14	San Benito	Bingag Cave	P-1 Maribujoc	9 56 10	125 58 2		Timberland	1. Small opening 2. Alive cave 3. Two exits	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
15	San Benito	Payawan Cave	P-4 Maribujoc	9 55 56	125 57 50	1 km from the barangay	Timberland	1. Alive cave 2. Small opening 3. vertical opening 4. Exit to sea	For further assessment
16	San Benito	Hayasan Cave	Brgy. Maribujoc	9 55 47	125 57 50	2 km away from the barangay	Timberland	1. Alive cave 2. Sinking 3. Small opening 4. Timberland	For further assessment
17	San Benito	Kaputian Cave	Brgy. Maribujoc	9 55 42	125 57 52	3 km away from the barangay	Timberland	1. Alive Cave 2. Big opening 3. Water inside the cave 4. drift/45° opening	For further assessment
18	San Benito	Hinagdan Cave	Brgy. Maribujoc	9 55 30	125 57 47	3.5 km away from the barangay	Timberland	1. Small opening 2. Alive cave	For further assessment
19	San Benito	Botong Cave	Brgy. Talisay	9 55 58	126 0 2	10 meters from the highway	Timberland	1. Alive cave 2. Medium opening 3. Presence of <i>Kwanit</i>	For further assessment
20	San Benito	Dakung Buyod Cave	Sitio Campingganon	9 56 1	125 57 14	1 km from the barangay hall	Timberland	1. Large opening 2. live cave 3. presence of flora and fauna 4. No water inside	For further assessment
21	San Benito	Bastian Matang - adlaw Cave	San Juan	9 57 55	126 1 58	3 km from the barangay hall	Timberland	1. live cave 2. no flora and fauna inside 3. medium opening 4. drift or horizontal cave	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
22	San Benito	Beatriz Matang-adlaw Cave	San Juan	9 57 55	126 1 57	3.5 km from the barangay hall	Timberland	1. small opening 2. live cave 3. vertical cave with 6 meters depth 4. sunlight can be seen in the exit	For further assessment
23	San Benito	Arthur Matang - adlaw Cave	San Juan	9 57 56	126 1 54	2.5 km from the barangay hall	Timberland	1. small opening 2. live cave 3. vertical cave with 50 meters depth	For further assessment
24	San Benito	Titoy Matang - adlaw Cave	San Juan	9 75 56	126 1 53	2 km from the barangay hall	Timberland	1. medium opening 2. live cave 3. The cave is situated near the bamboo trees. 4. drift or horizontal cave 5. Presence of water inside 6. No flora and fauna inside	For further assessment
25	San Benito	Pilar Matang - adlaw Cave	San Juan	9 57 54	126 1 52	1.8 km from the barangay hall	Timberland	1. large opening 2. live cave 3. no water inside 4. drift or horizontal cave	For further assessment
26	San Benito	Tayoto Matang - adlaw Cave	San Juan	9 57 55	126 1 50	1.8 km from the barangay hall	Timberland	1. small opening 2. live cave 3. drift or horizontal cave	For further assessment
27	San Benito	Kulas Matang -	San Juan	9 57 51	126 1 53	1.5 km from the barangay hall	Timberland	1. small opening 2. live cave	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
		adlaw Cave						3. drift or horizontal cave	
28	San Benito	Madga Cave	San Juan	9 58 37	126 1 34	1 km from the highway	Timberland	1. medium opening 2. live cave 3. source of water, fresh water and clear 4. drift or horizontal cave	For further assessment
29	San Benito	Camagong Cave	Brgy. Bongdo	9 54 52	125 59 47	1 km from the highway	Timberland	1. large opening 2. drift or horizontal cave 3. with brackish water inside	For further assessment
30	San Benito	Mabaho Cave	Brgy. Bongdo	9 55 8	126 0 21	2 km from the barangay hall	Timberland	1. large opening 2. live cave 3. presence of bats inside 4. has two exits 5. no water inside 6. 25 meters depth 7. drift or horizontal cave	For further assessment
Sta. Monica									
1	Sta. Monica	Danjug Cave	Brgy. Tangbo	10.05554	126.0532	100 m from the highway	A&D	1. Owned by Ricardo Lasco 2. Along the private property beach 3. The cave is totally developed by the owner with permanent infrastructure inside	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								4. Opening is about 20 ft wide and 15 ft. in height	
2	Sta. Monica	Guano Cave	Brgy. Libertad	9.985027	126.052867	1. Steepy path 2. Approximately 150 m from the highway	A&D	1. Owned by Uldarico Jelario 2. Large opening of about 30 ft in height and 40 ft wide 3. Steeply path down to the opening 4. Formerly practiced guano extraction inside 5. With Bats and <i>Sajaw</i>	For further assessment
3	Sta. Monica	Lawhag Cave	Brgy. Libertad	9.983012	126.05352	100 m from the highway	A&D	1. Owned by Eldiponso Buntag 2. Formerly source of livelihood water 3. Approximately 30 ft in depth with 2 ft. in height 4. With small chambers inside 5. With bats 6. Observed water drippings	For further assessment
4	Sta. Monica	Mag aso Cave	Brgy Mabini	9.957208	126.05299	10 min. motorcycle ride and 20 ft. walk	A&D	1. Cave is in good condition based on the cave formations present inside 2. The opening of the cave showed mining manifestation however	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								it does not affect the center of the cave 3. Bats observed 4. In order to room around the cave, people should duck. 5. Opening is about 5 ft.	
5	Sta. Monica	Vertical Cave	Brgy Mabini	9 57 44	126 3 13	10 min walk from the highway	A&D	1. Owned by Puring Lopez Escuyos 2. 1 opening of about 1 ft which only fit one small adult 3. About 6-7 ft in height inside of the cave and extend to 1 km. 4. Source of balay sa sayaw before 5. Presence of stalactites, bats and sayaw	For further assessment
6	Sta. Monica	Mined Cave	Brgy Mabini	9.966695	126.050485	150 m away from the highway	A&D	1. Showed treasure manifestation 2. No cave formations inside 3. Dead cave	Class 3
7	Sta. Monica	Celestino Cave	Brgy. Alegria	10 3 28	126 3 48	20 meters away from the highway	Titled	1. Small opening 2. Sinking 3 meters	For further assessment
8	Sta. Monica	Panlangan an Cave	Brgy. Alegria	10 3 13	126 3 53	5 meters from the diversion road	Titled	1. Big opening 2. Owned by certain Presko Pagola	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
9	Sta. Monica	Virgen sa Sta. Monica	Brgy. Alegria	10 3 28	126 3 48	20 meters away from the highway	Titled	1. Presence of bats 2. Big opening 3. Owned by Manuel Dagkota	For further assessment
10	Sta. Monica	Mahayag Cave	Brgy. Alegria	10 2 46	126 4 9	500 m from the highway	Titled	1. Owned by Rodriguez Bayhon 2. Small opening 3. Drift or vertical cave	For further assessment
11	Sta. Monica	Paulino Cave	Brgy. Alegria	10 2 48	126 4 9	550 m from the highway	Titled	1. Owned by Rodriguez Bayhon 2. Small opening 3. Drift or vertical cave 4. Live cave	For further assessment
12	Sta. Monica	Sikit Cave	Brgy. Alegria	10 2 49	126 4 8	600 m from the highway	Titled	1. Owned by Rodriguez Bayhon 2. Small opening 3. Vertical cave with 2 meters depth 4. Live cave	For further assessment
13	Sta. Monica	Bisai Cave	Brgy. Alegria	10 2 53	126 4 0	650 m from the highway	Titled	1. Owned by Rodriguez Bayhon 2. Large opening 3. Horizontal cave 4. According to the Brgy. Kagawad this cave measures 3.5 km depth 4. Live cave	For further assessment
14	Sta. Monica	Yamamoto Cave	Brgy. Magsaysay	9 59 56	126 2 20	700 m from the diversion road	Titled	1. Owned by Berto Maguhin 2. Has six chambers inside which all leads to	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								a beautiful and clear water pool 3. Live cave	
15	Sta. Monica	Titong Cave	Brgy. Abad Santos	9 59 43	126 2 10	1.5 km from the highway	Timberland	1. Large opening 2. Drift, 45° 3. Live cave	For further assessment
16	Sta. Monica	Tomas Cave	Brgy. Abad Santos	9 58 39	126 2 10	2.0 km from the highway	Timberland	1. The cave has two openings; small and large opening. 2. Vertical cave with 5 meters depth 3. Cave exit is 75° vertical	For further assessment
17	Sta. Monica	Tuod Cave	Brgy. Abad Santos	9 58 38	126 2 8	2.1 km from the highway	Timberland	1. Live cave 2. small opening 3. horizontal cave	For further assessment
18	Sta. Monica	Bagon Cave	Brgy. Abad Santos	9 59 37	126 2 7	2.5 km from the highway	Timberland	1. Live cave 2. large opening 3. vertical cave	For further assessment
19	Sta. Monica	Duyo Cave	Brgy. Abad Santos	9 58 36	126 2 6	3.0 km from the highway	Timberland	1. Live cave 2. large opening 3. presence of bats inside	For further assessment
20	Sta. Monica	Bailan Cave	Brgy. Bailan	10 0 22	126 2 41	1.5 km from the highway	Titled	1. Small opening 2. Vertical, 45° 3. The cave is located near the school 4. has exit	For further assessment
21	Sta. Monica	Vicenta Cave	Brgy. Bailan	10 0 30	126 2 42	1.0 km from the highway	Titled	1. Owned by Vicenta Comendador 2. Horizontal cave 3. has no exit	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
22	Sta. Monica	Tayagad Cave	Brgy. Bailan	9 59 50	126 2 54	250m along the highway	Titled	1. Owned by Disederioga 2. small opening 3. live cave 4. vertical cave 5. has no exit	For further assessment
23	Sta. Monica	Deyonga Cave	Brgy. Bailan	9 59 50	126 2 55	250m from the highway	Titled	1. Owned by Disederioga 2. small opening 3. vertical cave	For further assessment
24	Sta. Monica	Pablo Cave	Brgy. Bailan	9 59 52	126 2 56	300 m from the highway	Titled	h1. Owned by Pablo Bagotsay 2. with two small openings 3. vertical cave	For further assessment
25	Sta. Monica	Tubigan Cave	Brgy. Bailan	9 59 54	126 5 55	350 m from the highway	Titled	1. Owned by Pablo Bagotsay 2. small opening 3. horizontal cave 4. with flowing water	For further assessment
26	Sta. Monica	Bontai Cave	Brgy. Tangbo	10 2 49	126 2 52	250 m from the highway	Titled	1. Owned by Escobal Dagko 2. with three openings 3. live cave	For further assessment
27	Sta. Monica	Sardo Cave	Brgy. Garcia	10 2 48	126 4 14	1 meter from the highway	Titled	1. Small opening 2. Owned by certain Concha	For further assessment
Burgos									
1	Burgos	Bingag Cave	San Mateo	9 59 14	126 4 3	50 meters from the highway	Cocoland	With water inside Fauna observed inside 3 possible openings	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
2	Burgos	Malingin Cave	San Mateo	9 59 20	126 3 56	Along the road	N/A	along the road affected with road widening	For further assessment
3	Burgos	Ilihan Cave	Poblacion 2	10.01262	126.068655	15 min. motorcycle ride to the area and another 300 m walk	A&D	1. Large opening 2. About 30 ft in height and about 250 m wide inside 3. Bats observed	Assessed
4	Burgos	Patag Cave	Poblacion 1	10.008227	126.067462	motorcycle ride and 20 min walk	A&D	1. 2 openings with water inside the cave 2. about 500 m in depth chambers not included	Assessed
5	Burgos	Sumyot Cave	Poblacion 2	9.998448	126.080002	motorcycle ride and 10-15 min walk	A&D	1. about 300 m wide inside chambers not included	Assessed
6	Burgos	Agong-Agong Cave	Brgy. Matin-ao	9 51 39	126 3 51	Walking distance (70 meters from the highway)	Timberland	1. Source of water	For further assessment
7	Burgos	Kangapang Cave	Brgy. Matin-ao	9 51 39	126 3 46	Walking distance (40 meters from the highway)	Timberland	1. Source of water 2. Presence of dripping water	For further assessment
8	Burgos	Mosquito Cave	Brgy. Matin-ao	9 51 34	126 3 45	200 meters from the highway	Timberland	1. Source of water	For further assessment
9	Burgos	Minyong Cave	Brgy. Matin-ao	9 51 34	126 3 50	Cave under the road/highway	Timberland	1. Dead cave 2. Small opening 3. Showed presence of hazard	Not suitable for ecotourism
10	Burgos	Goloan Cave	Brgy. Matin-ao	9 51 29	126 3 24	500 meters from the highway	Timberland	1. 4 meters opening 2. Dead cave 3. No exit	Not suitable for ecotourism

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
11	Burgos	Dayakit Cave	San Mateo	9 59 23	126 4 8	50 meters walk from the barangay road	Timberland	1. Dead cave 2. Sinking	Not suitable for ecotourism
12	Burgos	Jamoyaon Cave	San Mateo	9 59 34	126 4 20	100 meters from the road	Timberland	1. Dead cave 2. 2 m wide opening 3. Water inside the cave 4. Sinking	Not suitable for ecotourism
SOCORRO									
1	Socorro	Nilusungan Cave	Brgy. Sta Cruz	9.65286	125.907762	By land, 30 minutes		1. Presence of water drippings 2. Large portal	suitable for ecotourism
2	Socorro	Bito Cave	Brgy. Sta Cruz	9.642298	125.912587	By land, 28 minutes	Agricultural	1. Presence of water drippings 2. Small portal	For further assessment
3	Socorro	Atanasio Cave	Brgy. Sta Cruz	9.640577	125.911183	By land, 15 minutes		Large portal	suitable for ecotourism
4	Socorro	Cave 1	Taruc	9.592208	125.97041	along the shoreline	Timberland	1. large opening 2. Cave posed hazards due to its fallen rocks 3. No formations and fauna observed 4. shows mining manifestation	Not suitable for ecotourism
5	Socorro	Cave 2	Taruc	9.592025	125.970252	along the shoreline	Timberland	1. tight opening 2. no fauna and formations found inside	Not suitable for ecotourism
6	Socorro	Cave 3	Taruc	9.590753	125.970834	along the shoreline	Timberland	1. about 1.5 m radius opening	Not suitable for ecotourism

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								2. slightly above ground level	
7	Socorro	Kamangun Cave	Taruc	9.590833	125.970967	along the shoreline	Timberland	1. 2 small and tight portals 2. no fauna and formations found inside	Not suitable for ecotourism
8	Socorro	Maze Cave	Taruc	9.594322	125.969182	along the shoreline	Timberland	1. 2 openings 2. with formations and bats inside	For further assessment
9	Socorro	Tulo ka lungag Cave	Taruc	9.592357	125.970195	along the shoreline	Timberland	1. 2 caves (horizontal and vertical) with about 2 m radius 2. No formations and fauna observed	Not suitable for ecotourism
10	Socorro	Guho Cave	Taruc	9.599935	125.968038	along the shoreline	Timberland	1. Large portal 2. small in depth 3. No formations and fauna observed	Not suitable for ecotourism
11	Socorro	Crack Cave	Taruc	9.599128	125.96799	along the shoreline	Timberland	1. Portal is about 1.5 m 2. cave is huge inside 3. No fauna and formations observed	Not suitable for ecotourism
12	Socorro	Tinago Cave	Taruc	9.59908	125.968082	along the shoreline	Timberland	1. portal is about 1 m radius 2. small cave 3. no fauna and formations observed	Not suitable for ecotourism
13	Socorro	Baybay Cave	Doña Helen	9.567288	125.940591	along the shoreline	Timberland	1. tight opening 2. no fauna and formations found inside	Not suitable for ecotourism

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								3. Cave formations can be seen outside 4. cave has water inside	
14	Socorro	Cave	Doña Helen	9.569745	125.943104	1 km from the barangay proper	Timberland	1. Opening seems like a crack in the rock 2. Opening is about 6m long 3. 2 openings 4. With water inside	Not suitable for ecotourism
15	Socorro	Lungag Cave	Doña Helen	9.56728	125.940615	along the shoreline	Timberland	1. Wide opening of about 8 m 2. Vertical cave serves as the community's waste disposal area	Can be classified as class 3
16	Socorro	Naugon Cave	Doña Helen	9.567365	125.941212	about 500 m from the barangay proper	Timberland	1. Tight opening of about 1 ft radius 2. Vertical cave	For further assessment
17	Socorro	Vertical Cave	Doña Helen	9.565648	125.940161	about 500 m from the barangay proper	Timberland	1. Tight opening. 2 openings 2. Vertical Cave 3. Fauna inside according to locals	For further assessment
18	Socorro	Cave	Estrella	9.623437	125.952313	along the highway	Cocoland	1. Opening is large enough for a person 2. Horizontal cave	For further assessment
19	Socorro	Sakaon Cave	Pamosaing an	9.639141	125.917521	along the highway	Cocoland	1. Opening is large enough for a person 2. Horizontal cave	For further assessment
20	Socorro	Cave	Pamosaing an	9.638613	125.917775	along the highway	Cocoland	1. Large opening 2. Horizontal cave	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATION	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
21	Socorro	Baba Buaya Cave	San Roque	9.629377	125.920052	about 10m from the road	A&D	1. Large opening 2. Horizontal cave 3. With diverse flora in the opening	For further assessment
22	Socorro	Cave 1	San Roque	9.629175	125.919692	about 10m from the road	A&D	1. Tight opening cave 2. Horizontal cave 3. Looks like connected to Baba Buaya cave but the guide is not certain	For further assessment
23	Socorro	Cave 2	San Roque	9.628778	125.92018	about 25m from the road	A&D	1. Opening is large enough for a person 2. Horizontal cave 3. With sayaw sightings	For further assessment
24	Socorro	Cave 3	San Roque	9.625539	125.916947	about 25m from the road	A&D	1. Wide opening	Not suitable for ecotourism
25	Socorro	Cave 4	San Roque	9.630221	125.918709	about 25m from the road	A&D	1. Wide opening	Not suitable for ecotourism
26	Socorro	Naugon Cave	San Roque	9.629436	125.919636	about 10m from the road	A&D	1. Large opening 2. Horizontal cave 3. With diverse flora in the opening	For further assessment
27	Socorro	Cave 5	San Roque	9.626232	125.915696	about 25m from the road	A&D	1. Tight opening	For further assessment
28	Socorro	Hidden Cave	San Roque	9.625539	125.916947	about 25m from the road	A&D	1. Tight opening	For further assessment
29	Socorro	Tubigan Cave	San Roque	9.625051	125.916782	about 25m from the road	A&D	1. Large opening	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								2. With water inside that is accordingly affected by the tide 3. Tourist had visited this cave	
30	Socorro	Vertical Cave 1	San Roque	9.626234	125.915834	about 25m from the road	A&D	1. opening is about 1 m radius 2. vertical cave	Not suitable for ecotourism
31	Socorro	Vertical Cave 2	San Roque	9.626293	125.915578	about 25m from the road	A&D	1. opening is about 1 m radius 2. vertical cave	Not suitable for ecotourism
32	Socorro	Posit Cave	Sitio, Tinago, Brgy. San Roque	9°36'46"N	125°55'19"E	The entrance is walking distance from the Diversion road by 100 meters	Timberland	1. entrance is vertical 3ft depth 2. 200 meters Horizontal from the entrance 3. Fauna and Flora observed 4.with sayaw bird sightings	For further assessment
33	Socorro	Abunohan Cave	Sudlon	9°36'41"N	125°56'22"E	979 meters walked from the barangay hall and 20meters from the province road	Timberland	1. Horizontal Cave 2. Inactive cave 3.Fauna observed 4. 2km from the entrance to exit 5.Large Opening 6. Source of fertilizer from the waste of Sayaw	For further assessment
34	Socorro	Tugas Cave	San Roque	9°37'7"N	125°54'32"E	1.9 kilometers walked and rided the pumpboat from the province	Timberland	1. Horizontal Cave 2.Large Opening 3.Fauna Observed	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								4. The exit of the cave is connected to crystal Cave	
35	Socorro	Culinos Cave	Sitio, Tinago, Brgy. San Roque	9°37'10"N	125°57'47"E	1 km. from highway road. 20 feet sinking. 50 meters depth	A&D	1. Horizontal Cave 2. Flora Observed 3. Abundant of Buta-buta Bird 4. Small Opening 5. Active Cave	For further assessment
36	Socorro	Dakit Cave	Sitio, Tinago, Brgy. San Roque	9°37'8"N	125°57'46"E	1 km from the highway road and 500 meters from the Culinos Cave	A&D	1. Large Opening, 20 feet mouth, 50 meters drip. 2. Abundant of Dakit trees 3. Abundant of Buta-buta Bird waste/ Fertilizer 4. Active Cave	For further assessment
37	Socorro	Sangat Cave	San Roque	9°37'33"N	125°54'35"E	Rided pumpboat around 15 minutes.	Timberland	1. Horizontal Cave 2. Large Opening 3. Fauna Observed 4. hide out of Japanese soldier during the war 5. There was <i>tridacna</i> sp. Shells discovered 6. with water inside that is accordingly affected by the tide	For further assessment
38	Socorro	Sihag Cave	Pamosaing an	9°38'16"N	125°55'7"E	29 meters from the road to entrance of the cave.	A&D	1. Horizontal Cave 2. Opening of the Cave is surrounded by flora 3. Wide Opening	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
39	Socorro	Sinabayan Cave	Pamosaing an	9°38'16"N	125°55'3"E	19 meters from the road to entrance of the cave	A&D	1. the entrance is cover by flora 2. Horizontal cave 3. Estimated 1km from entrance to exit	For further assessment
40	Socorro	Didoy Cave	Pamosaing an	9°37'49"N	125°55'27"E	475 meter from the road to the entrance of the cave	A&D	1.Horizontal Cave 2. Small opening 3.Entrance surrounded by flora 4.estimated 300 drift	For further assessment
41	Socorro	Aurel Cave	Pamosaing an	9°37'54"N	125°55'31"E	46 meters from the road to entrance	A&D	1.Horizontal Cave 2.inactive cave 3.Estimated more or less 1km from entrance to exit	For further assessment
42	Socorro	Biyasong Cave	Nueva Estrella	9°37'9"N	125°56'4"E	1.1 km from the road to entrance of the cave	A&D	1. Horizontal Cave 2.Small entrance 3.Tight Opening	For further assessment
43	Socorro	Nicario Cave	Nueva Estrella	9°37'38"N	125°56'20"E	39 meters from the road to entrance	A&D	1.Horizontal Cave, not active cave 2.Large entrance, 15 meters drip 3.Flora observed	For further assessment
44	Socorro	Biyasong Cave	Sitio Lubo, Brgy. Navarro	9°36'9"N	125°57'4"E	3 km riding from the brgy. Hall and 2 km walked the highway road	Timberland	1. 3.5 ft Opening 2. 500 meters 3.Abundant of Buta-buta Bird 4. Active Cave 5.Flora observed	For further assessment
45	Socorro	Kaluha Cave	Sitio Lubo, Brgy. Navarro	9°36'9"N	125°57'5"E	3 km riding from the brgy. Hall and 2 km walked the	Timberland	1. 2 mouth Opening 2. 50 meters drip	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
						highway road and 25 meters from Biyasong Cave		3.Abundant of Dakit caves 4. Active Cave 5.Wit Cave 6.Abundant of Buta-buta Bird	
46	Socorro	Hesus Cave	Sitio Lubo, Brgy. Navarro	9°36'9"N	125°57'5"E	3 km riding from the brgy. Hall and 2 km walked the highway road and beside from kaluha cave	Timberland	1. 2 mouth Opening 2. 50 meters drip 3.Abundant of Dakit caves 4. Active Cave 5.Wit Cave 6.Abundant of Buta-buta Bird	For further assessment
47	Socorro	Naga Cave	Brgy. Navarro	9.62002° N	125.95465° E	500 meters walked from the highway	A&D	1. Owned by Alice Banay-banay 2. Small opening 3. 4 meters sinking, 5 meters drp 4. Dry Cave 5.Flora observed	For further assessment
48	Socorro	Tiroy Cave	Brgy. Navarro	9.61975° N	125.95456° E	15 meters walked from Naga Cave	A&D	1. Owned by Tiroy (deceased) 2. Small opening 3. 4 meters sinking, 5 meters drop 4. Dry Cave 5.Flora observed	For further assessment
49	Socorro	Anton Cave	Brgy. Navarro	9.61977° N	125.95455° E	15 meters walked from Tiroy Cave	A&D	1. Owned by Anton (deceased) 2. Large opening	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								3. 20 meters sinking, 5 meters drip 4. Dry Cave 5. Flora observed 6. Vertical cave	
50	Socorro	Palasyo Cave	Sta. Cruz	9°38'25"N	125°54'49"E	1.5 km walked from the highway	Timberland	1. Vertical Entrance 2. 40 feet depth 3. Available for Evacuation 4. Active Cave 5. Entrance covered with Flora 6. Fauna observed 7. Formation of stalactite and Stalagmite	For further assessment
51	Socorro	Sayaw Cave	Sta. Cruz	9°38'32"N	125°54'45"E	700 meters walked from the highway	Timberland	1. Vertical Cave 2. 30 feet depth and beyond 3. Water observed inside the cave 4. Active Cave 5. small opening 6. Fauna and Flora observed	For further assessment
52	Socorro	Imnanan Cave	Sta. Cruz	9°38'13"N	125°54'32"E	1.7 km walked from the highway	A&D	1. Vertical Cave 2. Source of drinking water of the near community 3. Active Cave 4. Fauna and Flora observed	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								5. The entrance is horizontal	
53	Socorro	Lanao Cave	Sta. Cruz	9°38'12"N	125°54'22"E	15 minutes riding pumpboat, 60 meters walk from the beach	A&D	1. Horizontal Cave 2. Entrance covered by Nipa 3. Active Cave 4. Fuana observed 5. Small entrance, 60 meter drip 7. Formation of stalactite and Stalagmite	For further assessment
54	Socorro	Baliti Cave	Sta. Cruz	9°38'11"N	125°54'15"E	10 meters from the beach	Timberland	1. Horizontal Cave, 30 feet drip 2. Large entrance 3. Active Cave 4. 300 meters from the Lanao cave to Tinago cave 5. The entrance is horizontal abundant with Baliti tree	For further assessment
55	Socorro	Air Bomb Cave	Brgy. Don Albino Taruc	9.61823° N	125.9567°E	1 km. riding and 700 meter walked from the highway	A&D	1. 25 meters drip with 2 bito 2. small entrance 3. No fauna and flora observed 4. Owned by Raul Carduza	For further assessment
56	Socorro	Beto Cave	Brgy. Don Albino Taruc	9.61783° N	125.95688° E	15 meters walked from the Air bomb Cave	A&D	1. Owned by Raul Carduza	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
								2. 5 meters sinking, 15 meters drip 3. Small opening 4. Flora observed	
57	Socorro	Felizardo Cave	Brgy. Don Albino Taruc	9.61786° N	125.9567°E	15-20 meters walked from the air bomb cave	A&D	1. Owned by Raul Carduza 2. 5 meters sinking, 15 meters drip 3. Small opening 4. Flora observed 5. Water observed in the inside 6. Abundant of Buta-buta bird	For further assessment
PILAR									
1	Pilar	Kalinawan Cave	Caridad	9.907333	126.110127	walking distance 200 meters away from the highway	Timberland	1. Cavers needs to lay down in order to pass through the opening 2. Cave is about 7ft wide and 11 ft in height inside as estimated by the owner	suitable for ecotourism
2	Pilar	Lahos Cave	Caridad	9.906881	126.110767	Along the highway	Timberland	Dead Cave	Can be classified as class 3
3	Pilar	Lukod Cave	Pilaring	9.866868	126.107468	Along the highway		Dead Cave	Can be classified as class 3
4	Pilar	Mailag Cave	Pilaring	9.865718	126.112055	2 km from thwe highway, near the ocean		Dead Cave	Can be classified as class 3

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
5	Pilar	Pangpango n Cave	Pilaring	9.865435	126.110182	Far from highway near ocean	Timberland	Source of water	For further assessment
6	Pilar	Mahayok Cave	Datu	9.859332	126.048517	200 meters from the highway	Timberland	Presence of water dripping	For further assessment
7	Pilar	Tayangban Cave	Datu	9.861465	126.063353	200 meters from the highway	Agricultural	Presence of water dripping	For further assessment
8	Pilar	Balingo Cave	Datu	9.859693	126.058486	300 meters from the highway	Agricultural	Dead Cave	Not suitable for ecotourism Can be classified as class 3
9	Pilar	Salihog Cave	San Roque	9.881263	126.066869	1 km from the highway	Timberland	1. Dead cave 2. Showed presence of hazards	Can be classified as class 3
10	Pilar	Eba Cave	Sitio Tayangban , Brgy. Datu, Pilar, Surigao del Norte	9 51' 39" N	126 3' 51" E	Walking distance (70 meters from the highway)	Timberland	1. Source of water	For further assessment
11	Pilar	Curada Cave	Sitio Tayangban , Brgy. Datu, Pilar, Surigao del Norte	9 51' 39" N	126 3' 46" E	Walking distance (40 meters from the highway)	Timberland	1. Source of water 2. Presence of water drippings	For further assessment
12	Pilar	Hinterland Cave	Sitio Tayangban , Brgy. Datu, Pilar, Surigao del Norte	9 51' 34" N	126 3' 45" E	200 meters from the highway	Timberland	1. Source of water from rain	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
13	Pilar	Eba Illayom Cave	Sitio Tayangban , Brgy. Datu, Pilar, Surigao del Norte	9 51' 34" N	126 3' 50" E	Cave under the road/highway	Timberland	1. Dead cave 2. small opening 3. Showed presence of hazards	not suitable for ecotourism
14	Pilar	Putting Bato	Brgy. Datu, Pilar, Surigao del Norte	9 51' 33" N	126 3' 18" E	1 km from the road/highway	Timberland	1. Dead cave 2. Wide opening 3. No exit	For further assessment
15	Pilar	Hilog Cave	Brgy. San Roque, Pilar, Surigao del Norte	9 52 51	126 4 1	100 meters walking distance from the highway	Timberland	1. 5 meters opening 2. Exit to Sea	not suitable for ecotourism
16	Pilar	Comedez Cave	Brgy. Datu, Pilar, Surigao del Norte	9 51' 34" N	126 3' 17" E	1 km from the road/highway	Timberland	1. Dead cave 2. 5 meters wide opening	For further assessment
17	Pilar	Datu Cave	Brgy. Datu, Pilar, Surigao del Norte	9 51' 50" N	126 3' 41" E	50 meters from the highway	Timberland	1. Dead Cave 2. Small opening 3. Water inside the cave 4. sinking	not suitable for ecotourism
18	Pilar	Clementer Solloso Cave	Brgy. Datu, Pilar, Surigao del Norte	9 51' 50" N	126 3' 41" E	50 meters from the highway	Timberland	1. Dead Cave 2. Small opening 3. Water inside the cave 4. sinking	not suitable for ecotourism
DEL CARMEN									

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
1	Del Carmen	Cabugao Cave	Cabugao	9 48 16	126 0 42	1 km from the highway	Agricultural	1 Small opening	For further assessment
2	Del Carmen	Mahayahay Cave 1	Mahayahay	9 15 16	126 1 48	1 km from the highway	Agricultural	Vertical cave 1 small opening	For further assessment
3	Del Carmen	Mahayahay Cave 2	Mahayahay	9 51 14	126 1 54	1 km from the highway	Agricultural	tight opening enough for 1 person	For further assessment
4	Del Carmen	Mahayahay Cave 3	Mahayahay	9 51 16	126 1 53	1 km from the highway	Agricultural	Vertical cave 1 large opening	For further assessment
5	Del Carmen	Mahayahay Cave 4	Mahayahay	9 51 15	126 1 53	1 km from the highway	Agricultural	1 Small opening	For further assessment
6	Del Carmen	Mahayahay Cave 5	Mahayahay	5 51 15	126 1 55	1 km from the highway	Agricultural	Tight opening	For further assessment
7	Del Carmen	Mahayahay Cave 6	Mahayahay	6 51 16	126 1 56	1 km from the highway	Agricultural	Vertical cave 1 small opening	For further assessment
8	Del Carmen	Mahayahay Cave 7	Mahayahay	5 51 15	126 1 57	1 km from the highway	Agricultural	Large opening with huge stalactites Shows mining manifestation	For further assessment
9	Del Carmen	Mahayahay Cave 8	Mahayahay	9 51 16	126 1 57	1 km from the highway	Agricultural	Large opening but is hidden by a bush	For further assessment
10	Del Carmen	Mahayahay Cave 9	Mahayahay	9 51 17	126 1 57	1 km from the highway	Agricultural	Vertical cave 1 small opening	For further assessment
11	Del Carmen	Mahayahay Cave 10	Mahayahay	9 51 16	126 1 51	1 km from the highway	Agricultural	vertical cave Opening is about 1 x 2 meter	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
12	Del Carmen	Mahayahay Cave 11	Mahayahay	9 51 15	126 1 52	1 km from the highway	Agricultural	Tight opening	For further assessment
13	Del Carmen	Mataob Cave	Mataob	9 55 38	126 1 67	300 meters from the highway	Agricultural	Large opening with water inside	For further assessment
14	Del Carmen	Cave 1	Liaonan	9 53 7	125 54 45	along the shoreline	Timberland	Large opening within an islet	For further assessment
15	Del Carmen	Cave 2	Liaonan	9 53 41	125 54 3	along the shoreline	Timberland	opening is about 4 x 3 meters	For further assessment
16	Del Carmen	Cave 1	Caub	9 53 46	125 53 32	along the shoreline	Timberland	Large opening	For further assessment
17	Del Carmen	Mata Cave	Caub	9 53 57	125 53 27	along the shoreline	Timberland	2 large opening separated cave	For further assessment
18	Del Carmen	Cave 2	Caub	9 54 44	125 53 40	along the shoreline	Timberland	multiple caves along the shoreline	For further assessment
19	Del Carmen	Cave 3	Caub	9 55 1	125 53 49	along the shoreline	Timberland	opening is about 4 x 3 meters	For further assessment
20	Del Carmen	Tinabunan Cave	Caub	9 55 1	125 53 49	about 10 meters from the shoreline	Timberland	cave is closed and covered by coconut leaves	For further assessment
21	Del Carmen	Cave 4	Caub	9 55 5	125053 55	about 50 meters from the shoreline	Timberland	Large opening	For further assessment
22	Del Carmen	Cave 5	Caub	9 54 30	125 53 40	about 50 meters from the shoreline	Timberland	Large opening	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
23	Del Carmen	Dayakit Cave	Brgy. Esperanza	9 51 58	126 1 1	50 m from the highway	Timberland	1. small opening 2. vertical cave 3. alive but no water inside the cave	For further assessment
24	Del Carmen	Brgy. Esperanza	Brgy. Esperanza	9 51 52	126 1 24	500 m from the highway	Timberland	Dead cave; no exit	For further assessment
25	Del Carmen	Buyod Cave	Brgy. Antipolo	9 49 8	126 0 49	1 km from the highway	Timberland	1. Titled 2. Small opening 3. Dead cave 4. Water inside the cave	For further assessment
26	Del Carmen	Pangi Cave	Brgy. Antipolo	9 49 37	126 0 54	2 km away from the barangay	Timberland	1. Vertical cave 2. small opening 3. dead cave	For further assessment
27	Del Carmen	Poldo Cave	Brgy. Antipolo	9 49 32	126 0 58	3 km away from the barangay	Timberland	1. Large opening 2. Titled land 3. Guano Extraction 4. There's water in the bottom of cave 5. According to the guide, the cave was explored by the team of Doc Nelsen of Born to be Wild	For further assessment
28	Del Carmen	Orapa Cave	Brgy. Antipolo	9 49 29	126 0 53	1.5 km away from the barangay	Timberland	1. Small opening 2. Vertical cave	For further assessment
29	Del Carmen	Tinoy Cave	Brgy. Antipolo	9 49 24	126 0 52	1.5 km away from the barangay	Timberland	1. small opening 2. vertical cave 3. Small opening	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
30	Del Carmen	Meyon Cave	Brgy. Antipolo	9 49 24	126 0 58	1.5 km away from the barangay	Timberland	1. Horizontal cave 2. Alive cave 3. big opening 4. Untitled land	For further assessment
31	Del Carmen	Domingo Cave	Brgy. Antipolo	9 49 22	126 0 51	1.2 km away from the barangay	Timberland	1. horizontal cave 2. alive 3. small opening 4. water inside the cave	For further assessment
32	Del Carmen	Butuna Cave	Brgy. Antipolo	9 49 17	126 0 49	1.2 km away from the barangay	Timberland	1. dead cave 2. horizontal 3. big opening	For further assessment
33	Del Carmen	Dodo Cave	Brgy. Mahayahay	9 51 8	126 2 20	2 km away from the barangay	Timberland	1. vertical opening 2. small opening 3. alive cave	For further assessment
34	Del Carmen	Balingo Cave	Brgy. Mahayahay	9 51 20	126 2 27	1 km away from the highway	Timberland	1. alive cave 2. horizontal 3. big opening	For further assessment
35	Del Carmen	Fidel Cave	Brgy. Tuburan	9 50 17	126 2 35	2 km away from the barangay	Timberland	1. Small opening 2. vertical cave 3. water source 4. vertical opening 5. dead cave	For further assessment
36	Del Carmen	Miya Cave	Brgy. Tuburan	9 50 17	126 2 39	2.5 km away from the barangay	Timberland	1. vertical opening 2. big opening 3. water source	For further assessment
37	Del Carmen	Paran Cave	Brgy. Tuburan	9 50 28	126 2 38	3.5 km away from the barangay	Timberland	1. water source 2. small opening 3. horizontal opening	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATIO N	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
38	Del Carmen	Hesus Cave	Brgy. Tuburan	9 50 42	126 2 31	4 km away from the barangay	Timberland	1. alive cave 2. small opening 3. drift 4. nest of sayaw	For further assessment
39	Del Carmen	Manuel Cave	Brgy. Tuburan	9 50 26	126 2 30	3 km away from the barangay	Timberland	1. large opening 2. Sinking 3. alive cave 4. no water	For further assessment
40	Del Carmen	Bito Cave	Brgy. Tuburan	9 49 25	126 2 16	5 meter away from the highway	Timberland	1. small opening 2. drift 3. alive but no water inside the cave	For further assessment
San Isidro									
1	San Isidro	Cave	Del Pilar	9 55 39	126 4 29	1 km from the barangay	Cocoland	Claimed by Mr. Virgillo Peroata vertical cave	For further assessment
2	San Isidro	Cave	Pacifico	9 57 17	126 5 52	100 m from the road/highway/sea shore		Vertical entrance of about 1.5 x 2 m opening	not suitable for ecotourism
3	San Isidro	Ramon flores Cave	Pacifico	9 57 29	126 5 49	along the road	Cocoland	with water inside	not suitable for ecotourism
4	San Isidro	Tambakan Cave	Tambakan	9 55 32	126 2 22	along the road	Cocoland		not suitable for ecotourism
5	San Isidro	Mag-aso Cave	Brgy. Pelaez, San Isidro, SDN	9 56' 56" N	126 3' 6" E	100 meters walk from the road	Agricultural Land	1.source of water 2. presence of water drippings 1 x 2.5 meters opening 3.vertical entrance	For further assessment

NO	MUNICIPALITY	NAME OF CAVE	LOCATION	COORDINATES		ACCESSIBILITY	EXISTING LAND USE	REMARKS	RECOMMENDATION
				NORTH	EAST				
6	San Isidro	Perucho Cave	Brgy. Del Pilar, San Isidro, SDN	9 55' 46" N	126 4' 18"	1 km from the barangay	Cocoland	1. Claimed by Mr. Virgillo Perucho 2. vertical cave	For further assessment
7	San Isidro	Kansapang Cave	Brgy. Pacifico, San Isidro, SDN	9 57' 28" N	126 5' 49" E	100 meters from the road/highway	Cocoland	1. vertical entrance at about 1.5 x 2 meters opening	not suitable for ecotourism

Source: PAMO-SIPLAS Cave Inventory CY 2019-2022

ANNEX 6

List of Wetlands in SIPLAS

List of Wetlands in SIPLAS

WETLAND SITE NAME	WETLAND TYPES	WATERBODY CLASSIFICATION	LOCATION/ ADMINISTRATIVE COVERAGE	REMARKS
BURGOS				
Patag River	River	Class C	Poblacion 1	Used for irrigation
Ilihan Creek	Creek	Class C	Poblacion 2	Used for irrigation
Lilao Lake	Lake	Class C	Poblacion 2	Used for irrigation; assessed
San Mateo Marsh	Marshland		Brgy. San Mateo	Assessed with management plan
DAPA				
Bito	Spring	Class A	Sitio Lobo, Brgy 12	Source of water
Swamp	Spring	Class C	Sitio Lobo, Brgy 12	Serve as wallows
Suba	Spring	Class A	Brgy. Cambas-ac	Source of water
Magkahuyog Falls	Falls	Class A	Brgy. Consolacion	Source of water
Don Paulino Bonak	Marshland	Class C	Brgy. Don Paulino	
Bito ni Tiroy	Spring	Class A	Brgy. 12	Formerly source of potable drinking water
Matugas Bito	Spring	Class B	Brgy. 12	Source of laundry water and any similar household activities
Bonak 1	Marshland	Class C	Brgy. Osmeña	No infra built
Bonak 2	Marshland	Class C	Brgy. Osmeña	No infra built
Bonak 3	Marshland	Class C	Brgy. Osmeña	No infra built
Bonak 4	Marshland	Class C	Brgy. Osmeña	No infra built
Bonak 5	Marshland	Class C	Brgy. Osmeña	No infra built
Bonak 6	Marshland	Class C	Brgy. Osmeña	No infra built
Bonak 7	Marshland	Class C	Brgy. Osmeña	No infra built
Bonak 8	Marshland	Class C	Brgy. Osmeña	No infra built
Bonak 9	Marshland	Class C	Brgy. Osmeña	No infra built
Sapa	Creek		Brgy. Osmeña	
Bito	Spring	Class B	Brgy. Sta. Fe	Source of community water
Spring	Spring	Class B	Brgy. Sta. Fe	1. Serve as public bath
				2. Serve as community canal
				3. 4 springs
Spring	Spring	Class B	Brgy. Corregidor	Source of community water
Spring	Spring	Class B	Sitio Lubo, Brgy. 12	Source of livelihood
DEL CARMEN				
Puyangi Bulwak	Spring	Class A	Brgy. Taruc	1. Perennial creek
				2. Source of water

WETLAND SITE NAME	WETLAND TYPES	WATERBODY CLASSIFICATION	LOCATION/ ADMINISTRATIVE COVERAGE	REMARKS
River 1	River	Class C	Brgy. Honrado	1.Perennial river
				2.Source of farm lot irrigation
River 2	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of farm lot irrigation
River 3	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of farm lot irrigation
River 4	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of farm lot irrigation
River 5	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of farm lot irrigation
River 6	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of Community water
Bito	Spring	Class C	Brgy. Dona Helene	Intermittent Spring
Atabay	Spring	Class B	Brgy. Dona Helene	1.Perennial River
				2.Source of Community livelihood water (laba,ligo)
River	River	Class A	Brgy. Estrella	1.Perennial
				2.Community water source
Spring	Spring	Class B	Brgy. Estrella	1.Perennial
				2.Source of carwash water
Lake	Lake	Class C	Brgy. Estrella	Intermittent Lake
Suba	River	Class C	Brgy. Pamosaingan	Perennial River
Suba	River	Class C	Brgy. Songkoy	1.Perennial River
				2.Used for irrigation
Suba 2	River	Class C	Brgy. Songkoy	1.Perennial River
				2.Used for irrigation
Suba 1	River	Class C	Brgy. San Roque	1.Perennial River
				2.Used for irrigation
Suba 2	River	Class C	Brgy. San Roque	1.Perennial River
				2.Used for irrigation
Magkahuyog Falls	Falls	Class A	Brgy. Pamosaingan	Initial assessment
Tiktikan Lagoon	Lagoon		Brgy. San Roque	Assessed with management plan
GENERAL LUNA				
Creek 1	Creek		Poblacion	Community Creek

WETLAND SITE NAME	WETLAND TYPES	WATERBODY CLASSIFICATION	LOCATION/ ADMINISTRATIVE COVERAGE	REMARKS
Creek 1	Creek		Poblacion	Dumping area of water waste from the surrounding restaurants
Bito	Spring	Class A	Brgy. Corazon	1.Formerly source of community water but was not developed
				2.Still has water inside
Swamp	Swamp	Class C	Brgy. Consuelo	1.Grassland
				2.Used as fishpond
				3.Egrets spotted
PILAR				
Bito	Spring	Class B	Brgy. Katipunan	Source of laundry water and serves as public bath
Layungan Spring	Spring	Class B	Brgy. Katipunan	Serve as public bath
Balingo River	River	Class B	Brgy. Datu	Serve as public bath
Datu River	River	Class B	Brgy. Datu	Serve as public bath
Mahayok Creek	Creek		Brgy. Datu	Community Creek
Maasin River	River	Class B	Brgy. Maasin	Serve as public bath
Togbongan	Creek	Class B	Brgy. Mabini	Serve as public bath
Paghungawan Marsh	Masrhland	Class C	Brgy. Jaboy	Marshland assessed
Bogak	Spring	Class B	Brgy. Consolacion	Community spring
Pangpangon Bito	Spring	Class A	Brgy. Pilaring	Source of water
Hagonoy	Spring	Class A	Brgy. San Roque	Source of water community
SAN BENITO				
Guyangan Spring Pool	Spring	Class B	Brgy. Bongdo	Claimed by Mr. Marsico Rulete
Camagong spring pool	Spring	Class B	Brgy. Bongdo	Water source
Kan-encar spring pool	Spring	Class B	Brgy. Sta. Cruz	Claimed by Mr. Roculas
Magda Spring Pool	Spring	Class B	Brgy. San Juan	
Poneas Lake	Lake		Brgy. Maribojoc	Assessed with management plan
SAN ISIDRO				
Bito	Spring		Brgy. San Miguel	About 8m radius
Banggon Spring Siargao	Spring	Class B	Brgy. Buhing Kalipay	Used as Public bath

WETLAND SITE NAME	WETLAND TYPES	WATERBODY CLASSIFICATION	LOCATION/ ADMINISTRATIVE COVERAGE	REMARKS
Bito	Spring	Class C	Brgy. Del Pilar	Used in irrigation
River	River	Class B	Brgy. San Miguel	Used as Public bath and irrigation
STA. MONICA				
River	River	Class C	Brgy. Libertad	Community canal
Creek	Creek	Class C	Brgy. Tangbo	Community canal
Taktak falls	Falls	Class B	Brgy. Rizal	Tourist spot, assessed
Pamupoan Danao	Lake	Class C	Brgy. Mabini	Community <i>danao</i> with egrets observed
Casines Danao	Lake	Class C	Brgy. Mabini	Community <i>danao</i> with fauna observed
Anibong Danao	Lake	Class C	Brgy. Mabini	Community <i>danao</i> with fauna observed
Cabugsan Bito	Spring	Class C	Brgy. Mabini	Perennial Bito
Kamangon Bito	Spring	Class C	Brgy. Mabini	Perennial Bito
Bito 1	Spring	Class C	Brgy. Mabini	Intermittent Bito
Bito 2	Spring	Class C	Brgy. Mabini	1. Perennial Bito
				2. Deside damaged cave
Twin Bito	Spring	Class C	Brgy. Mabini	Intermittent Bito
Water Source Bito	Spring	Class C	Brgy. Mabini	Perennial Bito
Triplets Bito	Spring	Class C	Brgy. Mabini	Intermittent Spring
SOCORRO				
Puyangi Bulwak	Spring	Class A	Brgy. Taruc	1.Perennial creek
				2.Source of water
River 1	River	Class C	Brgy. Honrado	1.Perennial river
				2.Source of farm lot irrigation
River 2	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of farm lot irrigation
River 3	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of farm lot irrigation
River 4	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of farm lot irrigation
River 5	River	Class C	Brgy. Honrado	1.Perennial River
				2.Source of farm lot irrigation
River 6	River	Class C	Brgy. Honrado	1.Perennial River

WETLAND SITE NAME	WETLAND TYPES	WATERBODY CLASSIFICATION	LOCATION/ ADMINISTRATIVE COVERAGE	REMARKS
				2.Source of Community water
Bito	Spring	Class C	Brgy. Dona Helene	Intermittent Spring
Atabay	Spring	Class B	Brgy. Dona Helene	1.Perennial River
				2.Source of Community livelihood water (<i>laba, ligo</i>)
River	River	Class A	Brgy. Estrella	1.Perennial
				2.Community water source
Spring	Spring	Class B	Brgy. Estrella	1.Perennial
				2.Source of carwash water
Lake	Lake	Class C	Brgy. Estrella	Intermittent Lake
Suba	River	Class C	Brgy. Pamosaingan	Perennial River
Suba	River	Class C	Brgy. Songkoy	1.Perennial River
				2.Used for irrigation
Suba 2	River	Class C	Brgy. Songkoy	1.Perennial River
				2.Used for irrigation
Suba 1	River	Class C	Brgy. San Roque	1.Perennial River
				2.Used for irrigation
Suba 2	River	Class C	Brgy. San Roque	1.Perennial River
				2.Used for irrigation
Magkahuyog Falls	Falls	Class A	Brgy. Pamosaingan	Initial assessment
Tiktikan Lagoon	Lagoon		Brgy. San Roque	Assessed with management plan

Source: SIPLAS Inventory of Inland Wetland, 2019

ANNEX 7

List of identified beach forest species
in Siargao Island Protected Landscape
and Seascape (SIPLAS)

Identified beach forest species in Siargao Island Protected Landscape and Seascape

Family	Scientific Name
Aizoaceae	<i>Sesuvium portulacastrum</i>
Amaryllidaceae	<i>Crinum asiaticum</i>
Anacardiaceae	<i>Buchanania arborescens</i>
Apocynaceae	<i>Alstonia macrophylla</i>
	<i>Alstonia scholaris</i>
	<i>Cerbera manghas</i>
	<i>Dischidia platyphylla</i>
	<i>Hoya crassicaulis</i>
	<i>Tabernaemontana pandacaqui</i>
Araliaceae	<i>Schefflera odorata</i>
	<i>Schefflera actinophylla</i>
Arecaceae	<i>Cocos nucifera</i>
Aristolochiaceae	<i>Aristolochia</i> sp.
Asteraceae	<i>Pluchea indica</i>
	<i>Wedelia biflora</i>
Bignoniaceae	<i>Dolichandrone spathacea</i>
Boraginaceae	<i>Cordia subcordata</i>
	<i>Heliotropium foertherianum</i>
Casuarinaceae	<i>Casuarina equisetifolia</i>
	<i>Casuarina rumphiana</i>
Celastraceae	<i>Salacia wenzelii</i>
Combretaceae	<i>Terminallia catappa</i>
Convolvulaceae	<i>Ipomea pes-caprae</i>
Cycadaceae	<i>Cycas edentate</i>

Family	Scientific Name
Hernandiaceae	<i>Hernandia nymphaeifolia</i>
Lamiaceae	<i>Callicarpa pentandra</i>
	<i>Premna serratifolia</i>
	<i>Vitex parviflora</i>
	<i>Vitex trifolia</i> var. <i>trifolia</i>
Lauraceae	<i>Cassytha filiformis</i>
Lecythidaceae	<i>Barringtonia acutangula</i>
	<i>Barringtonia asiatica</i>
	<i>Barringtonia racemose</i>
Loranthaceae	<i>Amyema</i> sp.
Lythraceae	<i>Pemphis acidula</i>
Malpighiaceae	<i>Tristellateia australasiae</i>
Malvaceae	<i>Talipariti tilliaceum</i>
	<i>Thespesia populnea</i>
Melastomataceae	<i>Melastoma malabathricum</i>
Meliaceae	<i>Xylocarpus rumphii</i>
Moraceae	<i>Artocarpus blancoi</i>
	<i>Ficus microcarpa</i>
	<i>Ficus pedunculosa</i>
	<i>Ficus pseudopalma</i>
	<i>Ficus septica</i>
Myrtaceae	<i>Syzygium confertum</i>
	<i>Xanthostemon verdugonianus</i>
Nepenthaceae	<i>Nepenthes</i> sp.

Family	Scientific Name
Dilleniaceae	<i>Tetracera scandens</i>
Ebenaceae	<i>Diospyros ferrea</i>
	<i>Diospyros maritima</i>
Euphorbiaceae	<i>Breynia vitis-idaea</i>
	<i>Euphorbia antiquorum</i>
	<i>Flueggea Flexuosa</i>
	<i>Glochidion littorale</i>
	<i>Jatropha gossypifolia</i>
	<i>Macaranga tanarius</i>
Fabaceae	<i>Albizia retusa</i>
	<i>Caesalpinia crista</i>
	<i>Canavalia cathartica</i>
	<i>Canavalia maritima</i>
	<i>Cynometra ramiflora</i>
	<i>Dendrolobium umbellatum</i>
	<i>Derris trifoliata</i>
	<i>Erythrina variegata</i>
	<i>Intsia bijuga</i>
	<i>Millettia pinnata</i>
	<i>Sophora tomentosa</i>
	<i>Vigna marina</i>
Flagellariaceae	<i>Flagellaria indica</i>
Gentianaceae	<i>Utania volubilis</i>
Goodeniaceae	<i>Scaevola taccada</i>
Guttiferae	<i>Calophyllum inophyllum</i>

Family	Scientific Name
Nolinoideae	<i>Dracaena</i> sp.
Pandanaeae	<i>Pandanus dubius</i>
	<i>Pandanus polycephalus</i>
	<i>Pandanus tectorius</i>
Podocarpaceae	<i>Podocarpus polystachyus</i>
Primulaceae	<i>Ardisia squamulosa</i>
	<i>Myrsine densifolia</i>
Pteridaceae	<i>Acrostichum aureum</i>
	<i>Acrostichum speciosum</i>
Rhamnaceae	<i>Colubrina asiatica</i>
Rubiaceae	<i>Bikkia philippinensis</i>
	<i>Guettarda speciosa</i>
	<i>Morinda citrifolia</i>
	<i>Myrmecodia</i> sp.
	<i>Tarenna littoralis</i>
	<i>Timonius compressicaulis</i>
Sapotaceae	<i>Mimusops elengi</i>
	<i>Planchonella obovate</i>
Sterculiaceae	<i>Commersonia bartramia</i>
	<i>Heritiera littoralis</i>
	<i>Sterculia ceramic</i>
Taccaceae	<i>Tacca leontopetaloides</i>
	<i>Tacca palmate</i>
Vitaceae	<i>Leea guineensis</i>
	<i>Leea manillensis</i>

ANNEX 8

List of Terrestrial Fauna per PAMO SIPLAS BAMS CY 2018

ANNEX 8.1 List of Avifauna Species

Order	Family	Species	Common name	Distn Status	Population Status		
					IUCN	CITES	DAO 2004-15
Accipitriformes	Accipitridae	<i>Haliastur indus</i>	Brahminy Kite	NE	LC	NL	NL
		<i>Nisaetus pinskeri</i>	Pinsker's Hawk Eagle	NE	LC	NL	NL
		<i>Spilornis holospilus</i>	Phil. Serpent Eagle	NE	LC	NL	NL
Bucerotiformes	Bucerotidae	<i>Buceros hydrocorax</i>	Rufous Hornbill	PE	VU	NL	NL
		<i>Penelopides affinis</i>	Tarctic Hornbill	NE	LC	NL	NL
Caprimulgiformes	Apodidae	<i>Aerodramus mearnsi</i>	Phil. Swiftlet	PE	LC	NL	NL
		<i>Collocalia isonota</i>	Ridgetop Swiftlet	NE	LC	NL	NL
		<i>Hirundapus celebensis</i>	Purple Needletail	NE	LC	NL	NL
		<i>Mearnsia picina</i>	Phil. Spine-tailed Swift	NE	LC	NL	NL
Columbiformes	Columbidae	<i>Calcophaps indica</i>	Common Emerald dove	PE	LC	NL	NL
		<i>Phapitreron amethystinus</i>	Amethyst Brown Dove	PE	LC	NL	NL
		<i>Phapitreron brunneiceps</i>	Mindanao Brown Dove	PE	LC	NL	NL
		<i>Phapitreron leucotis</i>	White-eared Brown Dove	PE	LC	NL	NL
Coraciiformes	Alcedinidae	<i>Halcyon smyrnensis</i>	White-throated Kingfisher	NE	LC	NL	NL
		<i>Todiramphus chloris</i>	Collared Kingfisher	NE	LC	NL	NL
	Meropidae	<i>Merops philippinus</i>	Blue-tailed Bee-eater	NE	LC	NL	NL
Cuculiformes	Cuculidae	<i>Centropus melanops</i>	Black-faced Coucal	PE	LC	NL	NL
		<i>Centropus viridis</i>	Lesser Coucal	PE	LC	NL	NL
Passeriformes	Artamidae	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow	NE	LC	NL	NL
	Corvidae	<i>Corvus macrorhynchos</i>	Large-billed Crow	NE	LC	NL	NL
	Dicaeidae	<i>Dicaeum australe</i>	Red-keeled Flowerpecker	NE	LC	NL	NL
		<i>Dicaeum bicolor</i>	Bicolored Flowerpecker	NE	LC	NL	NL
		<i>Dicaeum hypoleucum</i>	Buzzing Flowerpecker	NE	LC	NL	NL
		<i>Dicaeum trigonostigma</i>	Orange-bellied Flowerpecker	NE	LC	NL	NL
	Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	NE	LC	NL	NL
	Laniidae	<i>Lanius cristatus</i>	Brown Shrike	NE	LC	NL	NL

Order	Family	Species	Common name	Distn Status	Population Status		
					IUCN	CITES	DAO 2004-15
		<i>Lanius schach</i>	Long-tailed Shrike	NE	LC	NL	NL
	Monarchidae	<i>Hypothymis azurea</i>	Black-naped Monarch	NE	LC	NL	NL
		<i>Hypothymis coelestis</i>	Celestial Monarch	NE	VU	NL	NL
	Motacillidae	<i>Motacilla cinerea</i>	Grey Wagtail	NE	LC	NL	NL
	Muscicapidae	<i>Ficedula westermanni</i>	Little Pied Flycatcher	NE	LC	NL	NL
	Nectariniidae	<i>Leptocoma sperata</i>	Purple-throated sunbird	NE	LC	NL	NL
	Oriolidae	<i>Oriolus chinensis</i>	Black-naped Oriole	NE	LC	NL	NL
	Pittidae	<i>Pitta sordida</i>	Hooded pitta	NE	LC	NL	NL
	Pycnonotidae	<i>Ixos philippinus</i>	Phil. Bulbul	PE	LC	NL	NL
		<i>Pycnonotus goiavier</i>	Yellow-vented Bulbul	NE	LC	NL	NL
		<i>Pycnonotus urostictus</i>	Yellow-wattled Bulbul	NE	LC	NL	NL
	Rhipiduridae	<i>Rhipidura javanica</i>	Pied Fantail	NE	LC	NL	NL
	Sturnidae	<i>Sarcops calvus</i>	Coletto	NE	LC	NL	NL
	Timaliidae	<i>Macronous striaticeps</i>	Brown-tit Babbler	NE	LC	NL	NL
Piciformes	Picidae	<i>Chrysocolaptes lucidus</i>	Buff-spotted Flameback	NE	LC	NL	NL
		<i>Picoides maculatus</i>	Phil. Pygmy Woodpecker	PE	LC	NL	NL
	Megalaimidae	<i>Psilopogon haemacephalus</i>	Coppersmith Barbet	NE	LC	NL	NL
Psittaciformes	Psittacidae	<i>Bolbopsittacus lunulatus</i>	Guiabero	NE	LC	NL	NL
		<i>Loriculus philippensis</i>	Phil. Hanging Parrot	PE	LC	NL	NL

ANNEX 8.2 List of Mamalian Species

Order	Family	Species	Common name	Distn Status	Population Status		
					IUCN	CITES	DAO 2004-15
Chiroptera	Pteropodidae	<i>Cynopterus brachyotis</i>	Common short-nosed fruit bat	NE	LC	NL	NL
		<i>Macroglossus minimus</i>	Long-tongue nectar bat	NE	LC	NL	NL
		<i>Megaerops wetmorei</i>	White-collared fruit bat	NE	VU	NL	NL
		<i>Ptenochirus minor</i>	Lesser musky fruit bat	PE	LC	NL	NL
Dermoptera	Cynocephalidae	<i>Cynocephalus volans</i>	Philippine flying lemur	PE	LC	NL	OTS
Primate	Tarsidae	<i>Tarsius syrichta</i>	Philippine tarsier	PE	NT	NL	OTS
Rodentia	Muridae	<i>Rattus sp.</i>	Field rat	NE	LC	NL	NL
	Sciuridae	<i>Sundasciurus philippinensis</i>	Philippine tree squirrel	PE	LC	NL	NL

ANNEX 8.3 List of Herpetofauna Species

Class	Family	Scientific Name	Common Name	Population Status		
				IUCN	CITES	DAO 2004-15
Reptilia	Agamidae	<i>Bronchocela cristatella</i>	Green crested lizard	LC	NA	NA
		<i>Draco bimaculatus</i>	Two-spotted flying lizard	LC	NA	NA
		<i>Draco mindanensis</i>	Mindanao flying lizard	VU	NA	NA
		<i>Draco sp. 1</i>	Flying lizard	NA	NA	NA
		<i>Draco sp. 2</i>	Flying lizard	NA	NA	NA
		<i>Draco sp. 3</i>	Flying lizard	NA	NA	NA
		<i>Gonocephalus sp.</i>	Tree dragon	NA	NA	NA
	Colubridae	<i>Elaphe sp.</i>	Rat snake	NA	NA	NA
	Gekkonidae	<i>Pseudogekko pungkaypinit</i>	Southern Philippine false gecko	NA	NA	NA
		<i>Pseudogekko sp. 1</i>	Gecko	NA	NA	NA
		<i>Pseudogekko sp. 2</i>	Gecko	NA	NA	NA
	Scincidae	<i>Eutropis multicarinata</i>	Common sun skink	NA	NA	NA
		<i>Eutropis sp. 1</i>	Skink	NA	NA	NA
		<i>Lamprolepis smaragdina</i>	Emerald tree skink	NA	NA	NA
		<i>Lipinia pulchella</i>	Yellow-striped slender tree skink	LC	NA	NA
		<i>Lipinia sp. 1</i>	Skink	NA	NA	NA
		<i>Parvoscincus kitangladensis</i>	Skink	NA	NA	NA
		<i>Pinoyscincus sp.</i>	Skink	NA	NA	NA
		<i>Sphenomorphus fasciatus</i>	Banded sphenomorphus	LC	NA	NA
		<i>Tropidophorus sp.</i>	Skink	LC	NA	NA

Class	Family	Scientific Name	Common Name	Population Status		
				IUCN	CITES	DAO 2004-15
Amphibia	Ceratobatrachidae	<i>Platymantis corrugatus</i>	Rough-backed forest frog	LC	NA	NA
		<i>Platymantis dorsalis</i>	Common forest frog	LC	NA	NA
		<i>Platymantis</i> sp. 1	Forest ground frog	NA	NA	NA
		<i>Platymantis</i> sp. 2	Forest ground frog	NA	NA	NA
		<i>Platymantis</i> sp. 3	Forest ground frog	NA	NA	NA
	Dicroglossidae	<i>Fejevaryia</i> sp.	Pond frog	NA	NA	NA
	Microhylidae	<i>Kalophrynus pleurostigma</i>	Black-spotted sticky frog	LC	NA	NA
	Ranidae	<i>Pulchrana grandocula</i>	Big-eyed frog	LC	NA	NA
	Rhacophoridae	<i>Philautus</i> sp.	Tree frog	NA	NA	NA
		<i>Philautus</i> sp. 1	Tree frog	NA	NA	NA
		<i>Philautus</i> sp. 2	Tree frog	NA	NA	NA
		<i>Philautus</i> sp. 3	Tree frog	NA	NA	NA
		<i>Polypedates</i> sp. 1	Forest ground frog	NA	NA	NA
		<i>Polypedates leucomystax</i>	Four-lined tree frog	LC	NA	NA
		<i>Rhacophorus bimaculatus</i>	Mindanao flying frog	LC	NA	NA

ANNEX 8.4 List of Arthropods Species

Class	Order	Family	Common Name	Scientific Name
Arachnida	Araneae	Araneidae	Orb spider	
			Spiny orb weaver spider	<i>Gasteracantha fornicata</i>
		Salticidae	Jumping spider	
		Thomisidae	Crab spider	
Insecta	Blattodea	Blattidae	German cockroach	<i>Blattela</i> sp.
		Rhinotermitidae	Termites	
	Coleoptera	Carabidae	Tiger beetle	
		Chrysomelidae	Leaf beetle	
		Curculionidae	Snout beetle	<i>Pachyrhynchus</i> sp
		Erotylidae	Fungus beetle	
		Lucanidae	Stag beetle	
	Diplopoda	Julidae	Millipede	
	Diptera	Tephritidae	Fly	
			Mottled fruit fly	<i>Rhagoletis</i> sp.
	Hemiptera	Cercopidae	Frog hopper	
		Pentatomidae	Stink bug	<i>Pygoplatis</i> sp.
			Stink bug	<i>Tessaratomia</i> sp.
		Reduviidae	Assassin bug	<i>Rhynocoris</i> sp.
		Scutelleridae	Shieldbacked bug	<i>Chrysocoris germari</i>
	Hymenoptera	Apidae	Sting bee	
		Formicidae	Black ants	<i>Anoplolepis gracilipes</i>
			Spiny weaver ant	<i>Polyrachis</i> sp.
		Vespidae	Wasp	
	Lepidoptera	Nymphalidae	Paper Kite Butterfly	<i>Idea leuconoe</i>
			Fritillary larva	
		Papilionidae	Papilionid butterfly	
			Swallow-tail butterfly	<i>Papilio polytes</i>
		Pieridae	Grass yellow butterfly	<i>Eurema hecabe</i>

Class	Order	Family	Common Name	Scientific Name
Insecta	Orthoptera	Gryllidae	Field cricket	<i>Libenthus</i> sp.
			Field cricket	<i>Paranisitra</i> sp.
		Tettigoniidae	Bush katydid	
			Katydid	
			Longhorned grasshopper	
	Phasmatodea	Phasmidae	Stick insect	<i>Baculum</i> sp.
			Stick insect	<i>Eurycantha calcarata</i>
			Stick insect	<i>Eurycantha</i> sp.
			Stick insect	<i>Pharnacia</i> sp.

Source: SIPLAS Biodiversity Assessment and Monitoring System (BAMS) CY 2018

ANNEX 9

List of flora species in SIPLAS
(BAMS Report, 2018)

Species Name	Local Name	Family	Endemism	IUCN	DAO
<i>Afzelia rhomboidea</i>	Sangay/Tindalo	Fabaceae			
<i>Aglaia rimosa</i>	Mata-mata	Meliaceae			
<i>Alstonia macrophylla</i>	Manga-manga	Apocynaceae	Non-en	LC	NL
<i>Alstonia scholaris</i>	Dita	Apocynaceae			
<i>Angiopteris Evecta</i>	Tree fem	Marattiaceae			
<i>Antidesma sp.</i>	Aglimokon	Phyllanthaceae	Non-en	LC	NL
<i>Artocarpus blancoi</i>	Antipolo	Moraceae			
<i>Artocarpus nitidus</i>	Kubi	Moraceae			
<i>Asplenium affine</i>		Asplenicaceae			
<i>Asplenium normale</i>		Asplenicaceae			
<i>Asplenium Percisifolium</i>		Asplenicaceae			
<i>Callicarpa surigaensis</i>	Buyakan	Lamiaceae			
<i>Calophyllum blancoi</i>	Bitanghol	Clusiaceae			
<i>Calophyllum inophyllum</i>	Bitag	Callophyllaceae			
<i>Canarium Asperum</i>	Pili-pili	Burseraceae			
<i>Canarium Ovatum</i>	Pili	Burseraceae			
<i>Caryota cumingii</i>	Bahi	Arecaceae			
<i>Celtis philippensis</i>	Jagao/Yagao	Cannabaceae			
<i>Cinnamomum mercadoi</i>	Kaningag	Lauraceae			
<i>Cinnamomum mindanaense</i>	Kaningag	Lauraceae			
<i>Cleidin ramosii</i>		Euphorbiaceae			
<i>Colona discolor</i>	Buntan	Malvaceae			
<i>Commersonia Bartramia</i>	Tolo	Malvaceae			
<i>Cratoxylon sumatranum</i>	Paguringon	Hypericaceae			
<i>Ctenitis Sylvatica</i>		Dryopteridaceae			
<i>Cyclopeltis crenata</i>		Dryopteridaceae			
<i>Diospyrus discolor</i>	Ituman	Ebenaceae	Non-en	NE	VU
<i>Diospyrus sp.</i>		Ebenaceae			
<i>Dracaena angustifolia</i>	Fortune Plant	Ruscaceae			
<i>Dryopteris Sparsa</i>		Dryopteridaceae			
<i>Drypetes Littoralis</i>	Batobato	Putranjivaceae			

Species Name	Local Name	Family	Endemism	IUCN	DAO
<i>Dysoxylum cumingianum</i>	Suha-suha	Meliaceae			
<i>Dysoxylum gaudichaudianum</i>	Bonghliw	Meliaceae	Non-en	NE	NL
<i>Erythrina orientalis</i>	Dapdap	Fabaceae			
<i>Excoecaria philippinensis</i>	Sawsaw	Euphorbiaceae			
<i>Fagraea racemosa</i>	Bagontapay	Gentianaceae			
<i>Ficus balete</i>	Dakit	Moraceae			
<i>Ficus minahassae</i>	Hagimit	Moraceae			
<i>Ficus nota</i>	Tabog	Moraceae			
<i>Ficus pseudopalma</i>	Lunbi-lubi	Moraceae			
<i>Flueggea flexuosa</i>	Anislag	Phyllanthaceae			
<i>Gnetum gnemon</i>	Bago	Gnetaceae			
<i>Gynotroches axillaris</i>	Duyok-duyok	Rhizoporaceae			
<i>Heterospathe sibuyanensis</i>	Bil-is	Arecaceae			
<i>Hopea acuminata</i>	Mangachapoi	Dipterocarpaceae			
<i>Leea manilensis</i>		Vitaceae			
<i>Lithocarpus solerianus</i>	Uwayan	Fugaceae			
<i>Litsea Philippinensis</i>	Hindang	Lauraceae			
<i>Litsea</i> sp.		Lauraceae			
<i>Lunasia amara</i>	Labaw	Rutaceae	Non-en	NE	NL
<i>Lygodium circinnatum</i>	Nitong-puti	Lygodiaceae			
<i>Matthaea sancta</i>		Monimiceae			
<i>Melastoma malabathricum</i>	Hantutugnaw	Melastomataceae			
<i>Melicope latifolia</i>	Bokbok	Rutaceae			
<i>Microsorium punctatum</i>		Polypodiaceae			
<i>Myristica philippensis</i>	Duguan	Myristaceae			
<i>Neonaudea calycina</i>	Hambabalud	Rubiaceae			
<i>Neotriwia cumingii</i>	Apanang	Euphorbiaceae			
<i>Nephrolepsis flexousa</i>		Oleandraceae			
<i>Nephrolepsis</i> sp.		Oleandraceae			
<i>Osmoxylon</i> sp.	Duma	Araliaceae			
<i>Pandanus exaltatus</i>	Wakatan	Pandanaceae			

Species Name	Local Name	Family	Endemism	IUCN	DAO
<i>Pandanus sp.</i>	Pandan	Pandanaceae			
<i>Parameria laevigata</i>	Tagukan	Apocynaceae			
<i>Paveta sp.</i>		Rubiaceae			
<i>Polyalthia oblongifolia</i>	Lapnisan	Annonaceae			
<i>Polyscias nodosa</i>	Malapapaya	Araliaceae			
<i>Premna subglara</i>	Abgaw	Lamiaceae			
<i>Pteridys syrmatica</i>		Aspidiaceae			
<i>Pterocymbium macrocrater</i>	Sedyotes	Sterculiaceae			
<i>Pygeum sp.</i>	Among	Rosaceae			
<i>Radermachera gigantea</i>	Saya	Bignoniaceae			
<i>Radermachera pinata</i>	Banay-banay	Bignoniaceae			
<i>Sararanga philippinensis</i>	Baliw	Pandanaceae			
<i>Silaginella delicatula</i>		Silaginellaceae			
<i>Silaginella englerii</i>		Silaginellaceae			
<i>Silaginella plana</i>		Silaginellaceae			
<i>Shorea astylosa</i>	Yakal	Dipterocarpaceae			
<i>Shorea contorta</i>	Lauan puti	Dipterocarpaceae	Phil-En	CR	VU
<i>Shorea hopeifolia</i>	Bahay	Dipterocarpaceae			
<i>Shorea negrosensis</i>	Lauan pula	Dipterocarpaceae			
<i>Syngrama sp.</i>		Pteridaceae			
<i>Syngrama wallichii</i>		Pteridaceae			
<i>Syzygium leytense</i>	Bagotambis	Myrtaceae			
<i>Tectaria angulata</i>		Dryopteridaceae			
<i>Tectaria christii</i>		Dryopteridaceae			
<i>Tectaria crenata</i>		Dryopteridaceae			
<i>Tectaria decurens</i>		Dryopteridaceae			
<i>Terminalia foetidissima</i>	Magotalisay	Combretaceae			
<i>Tristaniopsis decorticata</i>	Tiga	Myrtaceae			
<i>Vitex parviflora</i>	Jamoyaon/Tugas	Lamiaceae			

ANNEX 10

Marine Sanctuaries with approved Municipal Ordinance

Marine Sanctuaries with approved Municipal Ordinance

MUNICIPALITY	NAME OF MPA	HECTARES	YEAR ESTABLISHED	MUNICIPAL ORDINANCE
Dapa	Corregidor Marine Protected Area	149 has.	2006	Municipal Ordinance No. 01, series of 2006; Municipal Ordinance No. 05, series of 2017
Pilar	Pilar Marine Protected Area	119 Has.	2013	Municipal Ordinance no. 002 series of 2013
	Salvacion Marine Sanctuary	20 has.	2015	Municipal Ordinance no. series of 2016
Del Carmen	Caub Marine Protected Area	51.5 has	2015	Ordinance # 02 series of 2014 (sanctuary)
		2144 has. (MAA)		
	San Fernando Marine Protected Area	33 has.	2015	MAA ordinance # 015 series of 2017
		744 has (MAA)		
San Benito	Maribojoc Marine Protected Area	26 has.	2012	Municipal Ordinance No. 079-15, series of 2015
	Talisay Marine Sanctuary	254 has.	2010	Municipal Ordinance No. 068-10 series of 2010
San Isidro	Tigasao Marine Protected Area	35 has.	2015	Municipal Ordinance No. 2015-04
Burgos	Lakyaon Marine Protected Area	28.8 has	2009	Municipal Ordinance No.1, series of 2009
Sta. Monica	T-Arlan Marine Protected Area	2016	2016	Municipal Ordinance No. 057, series of 2016
	Rizal Marine Sanctuary	38.87 has.	2017	Municipal Ordinance No. 069 series of 2017
	Alegria Marine Sanctuary	43 has.	2017	Municipal Ordinance No. 069 series of 2017
Socorro	Pamosaingan Marine Protected Area	53.84 has	2003	Municipal Ordinance No. 03 series of 2003

Source: SIPLAS-PAMO

ANNEX 11

REEF FISHES IN SIPLAS

Annex 11.1. List of Reef Fish in SIPLAS

FAMILY	SPECIES
Acanthuridae	<i>Acanthurus auranticavus</i>
	<i>Acanthurus japonicus</i>
	<i>Acanthurus lineatus</i>
	<i>Acanthurus nigricans</i>
	<i>Acanthurus nigrofuscus</i>
	<i>Acanthurus nigroris</i>
	<i>Acanthurus pyroferus</i>
	<i>Ctenochaetus binotatus</i>
	<i>Ctenochaetus striatus</i>
	<i>Ctenochaetus strigosus</i>
	<i>Naso annulatus</i>
	<i>Naso lituratus</i>
	<i>Naso unicornis</i>
	<i>Paracanthurus hepatus</i>
	<i>Zebrasoma scopas</i>
	<i>Zebrasoma veliferum</i>
Apogonidae	<i>Apogon cookii</i>
	<i>Apogon sealei</i>
	<i>Cheilodipterus artus</i>
	<i>Cheilodipterus macrodon</i>
	<i>Cheilodipterus quinquelineatus</i>
	<i>Cheilodipterus nigrotaeniatus</i>
Aulostomidae	<i>Aulostomus chinensis</i>
Balistidae	<i>Balistapus undulatus</i>
	<i>Balistoides viridescens</i>
	<i>Melichthys vidua</i>
	<i>Sufflamen bursa</i>
	<i>Sufflamen chrysopteron</i>
	<i>Meiacanthus grammistes</i>
Blenniidae	<i>Plagiotremus laudandus</i>
	<i>Plagiotremus tapeinosoma</i>
Caesionidae	<i>Caesio cuning</i>
	<i>Caesio teres</i>
Carangidae	<i>Carangoides ferdau</i>
	<i>Selar crumenophthalmus</i>
Centriscidae	<i>Aeoliscus strigatus</i>
Chaetodontidae	<i>Chaetodon auriga</i>
	<i>Chaetodon citrinellus</i>

FAMILY	SPECIES
Chaetodontidae	<i>Chaetodon ephippium</i>
	<i>Chaetodon kleinii</i>
	<i>Chaetodon lunula</i>
	<i>Chaetodon lunulatus</i>
	<i>Chaetodon melannotus</i>
	<i>Chaetodon meyeri</i>
	<i>Chaetodon octofasciatus</i>
	<i>Chaetodon ornatissimus</i>
	<i>Chaetodon punctatofasciatus</i>
	<i>Chaetodon rafflesii</i>
	<i>Chaetodon reticulatus</i>
	<i>Chaetodon trifascialis</i>
	<i>Chaetodon ulietensis</i>
	<i>Chaetodon unimaculatus</i>
	<i>Chaetodon vagabundus</i>
	<i>Chaetodon xanthurus</i>
	<i>Coradion chrysozonus</i>
	<i>Forcipiger longirostris</i>
	<i>Heniochus chrysostomus</i>
	<i>Heniochus pleurotaenia</i>
	<i>Heniochus singularius</i>
	<i>Heniochus varius</i>
Cirrhitidae	<i>Paracirrhites arcatus</i>
	<i>Paracirrhites forsteri</i>
Gobiidae	<i>Amblygobius phalaena</i>
	<i>Plectorhinchus chaetodonoides</i>
Fistularidae	<i>Fistularia petimba</i>
Haemulidae	<i>Plectorhinchus diagrammus</i>
	<i>Plectorhinchus picus</i>
	<i>Plectorhinchus vittatus</i>
Holocentridae	<i>Myripristis berndti</i>
	<i>Myripristis kuntzei</i>
	<i>Myripristis murdjan</i>
	<i>Neoniphon argenteus</i>
	<i>Neoniphon opercularis</i>
	<i>Neoniphon sammara</i>
	<i>Sargocentron caudimaculatum</i>
Kyphosidae	<i>Kyphosus cinerascens</i>
	<i>Anampses neoguinaicus</i>

FAMILY	SPECIES
Labridae	<i>Anampses twistii</i>
	<i>Bodianus bimaculatus</i>
	<i>Bodianus mesothorax</i>
	<i>Cheilinus chlorourus</i>
	<i>Cheilinus fasciatus</i>
	<i>Cheilinus trilobatus</i>
	<i>Choerodon anchorago</i>
	<i>Cirrhilabrus cyanopleura</i>
	<i>Coris batuensis</i>
	<i>Coris gaimard</i>
	<i>Diploprion bifasciatum</i>
	<i>Diproctacanthus xanthurus</i>
	<i>Epibulus insidiator</i>
	<i>Gomphosus varius</i>
	<i>Halichoeres chloropterus</i>
	<i>Halichoeres hortulanus</i>
	<i>Halichoeres leucurus</i>
	<i>Halichoeres marginatus</i>
	<i>Halichoeres melanochir</i>
	<i>Halichoeres melanurus</i>
	<i>Halichoeres nebulosus</i>
	<i>Hemigymnus melapterus</i>
	<i>Labrichthys unilineatus</i>
	<i>Labroides dimidiatus</i>
	<i>Macropharyngodon meleagris</i>
	<i>Macropharyngodon negrosensis</i>
	<i>Oxycheilinus digramma</i>
	<i>Oxycheilinus unifasciatus</i>
	<i>Pseudocheilinus hexataenia</i>
	<i>Pteragogus cryptus</i>
	<i>Pteragogus guttatus</i>
	<i>Stethojulis bandanensis</i>
	<i>Stethojulis strigiventer</i>
	<i>Stethojulis trilineata</i>
	<i>Thalassoma hardwicke</i>
	<i>Thalassoma janssenii</i>
	<i>Thalassoma lunare</i>
	<i>Thalassoma quinquevittatum</i>
Lethrinidae	<i>Lethrinus nebulosus</i>

FAMILY	SPECIES
	<i>Monotaxis grandoculis</i>
Lutjanidae	<i>Lutjanus biguttatus</i>
	<i>Lutjanus decussatus</i>
Lutjanidae	<i>Lutjanus fulviflammus</i>
	<i>Macolor macularis</i>
	<i>Macolor niger</i>
Monacanthidae	<i>Amanses scopas</i>
	<i>Cantherhines dumerilii</i>
	<i>Oxymonacanthus longirostris</i>
	<i>Pervagor janthinosoma</i>
	<i>Pervagor aspricaudus</i>
Nemipteridae	<i>Pentapodus caninus</i>
	<i>Scolopsis bilineata</i>
	<i>Scolopsis ciliata</i>
	<i>Scolopsis margaritifer</i>
Ostraciidae	<i>Ostracion solorensis</i>
	<i>Ostracion meleagris</i>
Pempheridae	<i>Pempheris oualensis</i>
Pinguipedidae	<i>Parapercis clathrata</i>
	<i>Parapercis xanthozona</i>
Pomacanthidae	<i>Centropyge bicolor</i>
	<i>Centropyge bispinosus</i>
	<i>Centropyge tibicen</i>
	<i>Centropyge vrolikii</i>
	<i>Chaetodontoplus mesoleucus</i>
	<i>Pomacanthus imperator</i>
	<i>Pygoplites diacanthus</i>
Pomacentridae	<i>Abudefduf sexfasciatus</i>
	<i>Abudefduf vaigiensis</i>
	<i>Acanthochromis polyacanthus</i>
	<i>Amblyglyphidodon curacao</i>
	<i>Amblyglyphidodon leucogaster</i>
	<i>Amphiprion clarkii</i>
	<i>Amphiprion melanopus</i>
	<i>Amphiprion perideraion</i>
	<i>Cheiloprion labiatus</i>
	<i>Chromis lepidolepis</i>
	<i>Chromis margaritifer</i>
	<i>Chromis ternatensis</i>

FAMILY	SPECIES
Pomacentridae	<i>Chromis viridis</i>
	<i>Chromis opercularis</i>
	<i>Chrysiptera cyanea</i>
	<i>Chrysiptera oxycephala</i>
	<i>Chrysiptera parasema</i>
	<i>Chrysiptera rex</i>
	<i>Chrysiptera rollandi</i>
	<i>Dascyllus aruanus</i>
	<i>Dascyllus trimaculatus</i>
	<i>Dischistodus melanotus</i>
	<i>Dischistodus perspicillatus</i>
	<i>Dischistodus prosopotaenia</i>
	<i>Hemiglyphidodon plagiometopon</i>
	<i>Neoglyphidodon melas</i>
	<i>Neoglyphidodon nigroris</i>
	<i>Neoglyphidodon thoracotaeniatus</i>
	<i>Plectroglyphidodon dickii</i>
	<i>Plectroglyphidodon johnstonianus</i>
	<i>Plectroglyphidodon lacrymatus</i>
	<i>Pomacentrus adelus</i>
	<i>Pomacentrus alexanderae</i>
	<i>Pomacentrus amboinensis</i>
	<i>Pomacentrus bankanensis</i>
	<i>Pomacentrus burroughi</i>
	<i>Pomacentrus chrysurus</i>
	<i>Pomacentrus lepidogenys</i>
	<i>Pomacentrus moluccensis</i>
	<i>Pomacentrus opisthostigma</i>
	<i>Pomacentrus philippinus</i>
	<i>Pomacentrus simsiang</i>
	<i>Pomacentrus stigma</i>
	<i>Pomacentrus vaiuli</i>
Pseudochromidae	<i>Labracinus cyclophthalmus</i>
Ptereleotridae	<i>Ptereleotris evides</i>
	<i>Calotomus japonicus</i>
	<i>Cetoscarus bicolor</i>
	<i>Chlorurus bleekeri</i>
	<i>Chlorurus bowersi</i>
	<i>Chlorurus sordidus</i>

FAMILY	SPECIES
Scaridae	<i>Hipposcarus longiceps</i>
	<i>Scarus dimidiatus</i>
	<i>Scarus flavipectoralis</i>
	<i>Scarus ghobban</i>
	<i>Scarus hypselopterus</i>
	<i>Scarus niger</i>
	<i>Scarus quoyi</i>
	<i>Scarus rubroviolaceus</i>
	<i>Scarus scaber</i>
	<i>Scarus tricolor</i>
Serranidae	<i>Aphareus rutilans</i>
	<i>Cephalopholis argus</i>
	<i>Cephalopholis cyanostigma</i>
	<i>Cephalopholis urodeta</i>
	<i>Cromileptes altivelis</i>
	<i>Diploprion bifasciatum</i>
	<i>Epinephelus fasciatus</i>
	<i>Cephalopholis leopardus</i>
	<i>Epinephelus ongus</i>
	<i>Plectropomus areolatus</i>
Siganidae	<i>Siganus guttatus</i>
	<i>Siganus virgatus</i>
	<i>Siganus vulpinus</i>
	<i>Siganus vermiculatus</i>
	<i>Siganus spinus</i>
Syngnathidae	<i>Doryrhamphus dactyliophorus</i>
Tetraodontidae	<i>Arothron mappa</i>
	<i>Canthigaster papua</i>
	<i>Canthigaster solandri</i>
	<i>Canthigaster valentine</i>
Zanclidae	<i>Zanclus cornutus</i>

Source: CoRVA 2014, SIPLAS Coral Reef Assessment 2020

Annex 11.2. List of Fish Families found in SIPLAS

Family	Functional	Group
Acanthuridae	Herbivore	Target (Resilience)
	Detritivore	Target
	Herbivore	Target (Resilience)
	Herbivore	Major (Resilience)
Aulostomidae	Benthic Invertivore	Major
Balisitdae	Benthic Invertivore	Major
Caesonidae	Planktivore	Target
Chaetodontidae	Benthic Carnivore, Herbivore	Indicator(Coral Cover, Resilience)
Diodontidae	Benthic Invertivore	Major
Gobiidae	Herbivore	Major (Resilience)
Holocentridae	Benthic Invertivore	Target
	Benthic Invertivore	Target
	Benthic Invertivore	Target
	Benthic Invertivore	Target
	Benthic Invertivore	Major
	Benthic Invertivore	Target
Labridae	Benthic Invertivore	Major
	Benthic Invertivore	Target
	Benthic Invertivore	Major
	Benthic Invertivore	Major
Lutjanidae	Piscivore	Target
Monacanthidae	Benthic Invertivore	Major
Mullidae	Benthic Invertivore	Target
Nemipteridae	Benthic Invertivore	Target
Ostraciidae	Benthic Invertivore	Major
Plotosidae	Benthic Invertivore	Major
Pomacanthidae	Coralivore	Indicator (Coral Cover)
Pomacentridae	Planktivore	Major
	Planktivore	Major
	Herbivore, Planktivore	Major (Resilience)
	Herbivore	Major (Resilience)
	Herbivore	Major (Resilience)
	Herbivore	Major (Resilience)
	Herbivore	Major (Resilience)
Scaridae	Herbivore	Target (Resilience)
	Herbivore	Target (Resilience)
Serranidae	Benthic Invertivore	Target
Zanclidae	Omnivore	Major

Source: CoRVA Data 2014

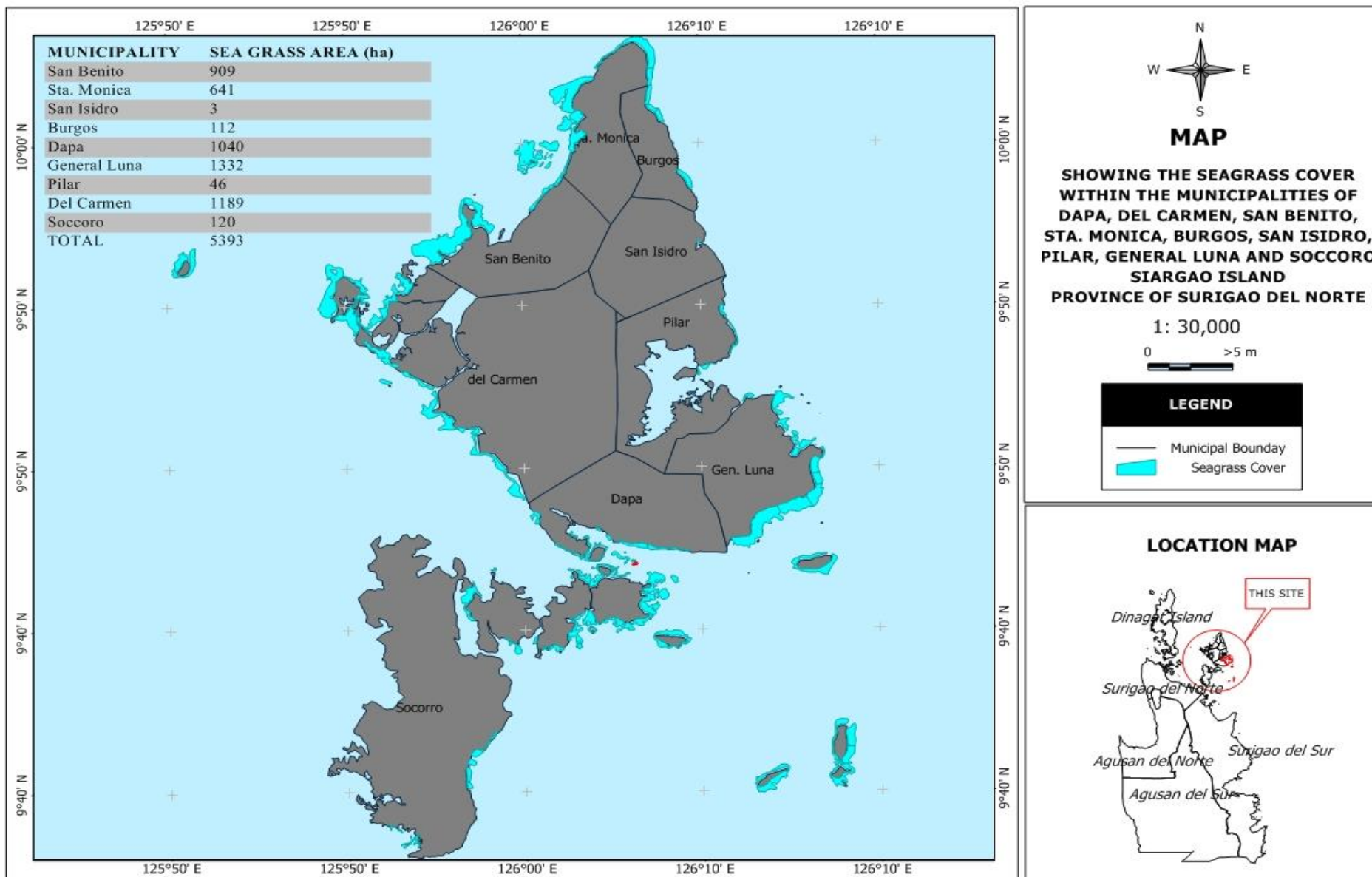
Annex 11.3. List of Pelagic Fishes in SIPLAS

Family	Scientific Name	Common name	Local Name
Carangidae	<i>Selar crumenophthalmus</i>	Big-eyed Scad	Matang-baka
Coryphaenidae	<i>Coryphaena hippurus</i>	Dolphin fish	Dorado
Istiophoridae	<i>Istiophorus platypterus</i>	Indo-pacific Sailfish	Liplipan
Scombridae	<i>Acanthocybium solandri</i>	Spanish Mackerel	Tangingue
	<i>Thunnus albacares</i>	Yellowfin Tuna	Bariles
	<i>Katsuwonus pelamis</i>	Skipjack tuna	Bariles
	<i>Rastrelliger kanagurta</i>	Indian mackerel	Anduhaw
	<i>Euthynnus affinis</i>	Eastern Little Tuna	Tulingan
	<i>Auxis thazard</i>	Frigate Tuna	Tulingan
Xiphiidae	<i>Xiphias gladius</i>	Swordfish	Malasugi

Source: Fisheries Profile, BFAR

ANNEX 12

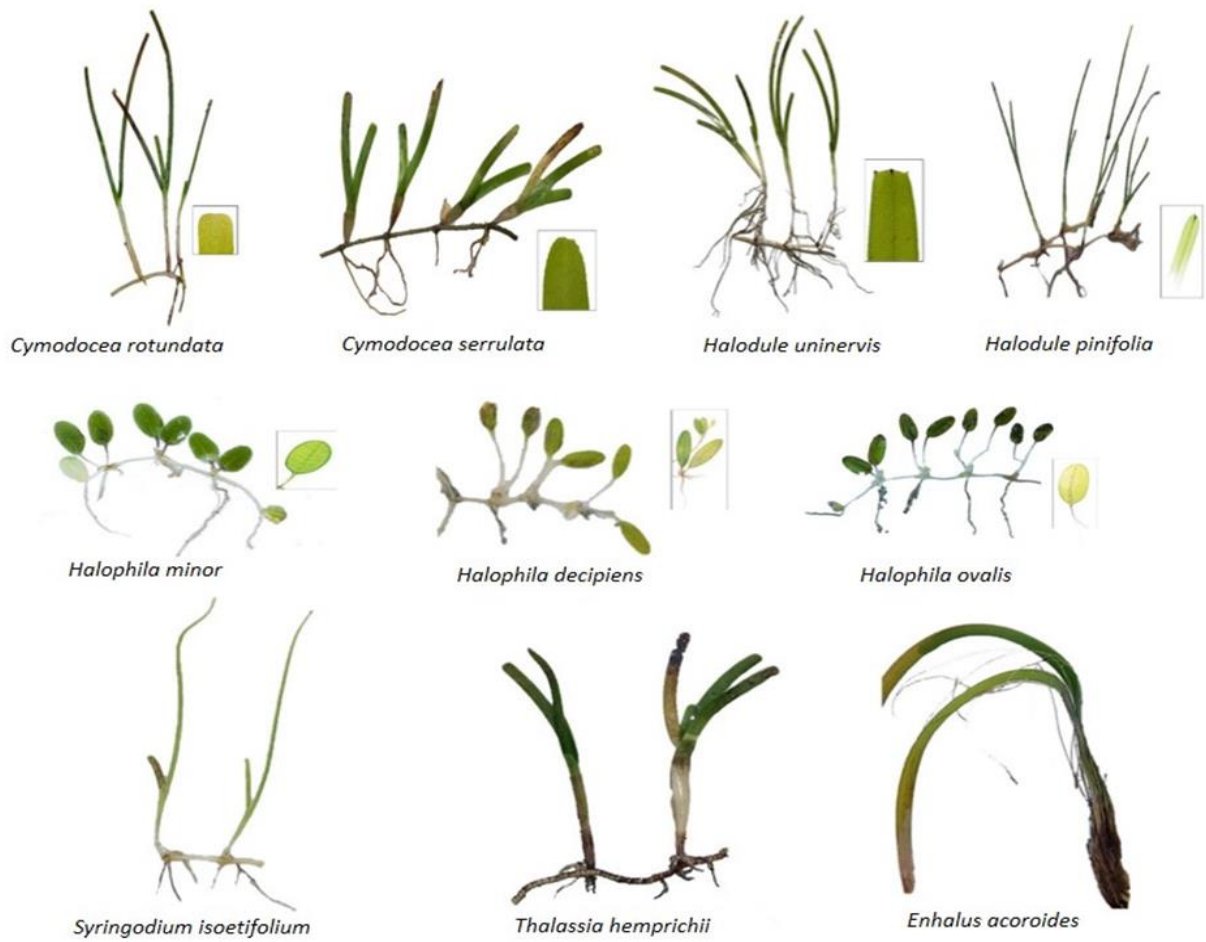
Seagrass Cover in nine (9) municipalities in SIPLAS



ANNEX 13

Seagrass Species Identified in SIPLAS

Seagrass Species Identified in SIPLAS



ANNEX 14

Detailed List of Ecotourism Sites and its location and characteristics in Siargao Island Protected Landscape and Seascape (SIPLAS)

ECOTOURISM SITE	LOCATION	TYPE	DESCRIPTION
Sunrise Beach	Burgos	Sun and Beach	An ideal place for picnics and outing. A perfect place to watch the sunrise. That's why it's named Sunrise beach.
Burgos Surfing Site	Burgos	Natural Waves	Burgos in Siargao Islands is an exposed reef break that has reliable surf. Autumn and winter are the best times of year for waves. The best wind direction is from the southwest and there is no shelter here from cross shore breezes. Most of the surf comes fits in the form of windswells and the ideal wave direction is from the northeast. There is no reef break. Relatively few surfers here, even on good days. Watch out for rocks.
Corregidor Island	Dapa	Sun and Beach	Corregidor Island is a place for swimming, snorkeling, and trekking. Its sanctuary is a living ocean park and is home to schools of various species of fish, squid, octopus, corals, and rare marine turtles. The top of the island has a marvelous panoramic view of the Pacific Ocean and neighboring islands.
Union Beach	Dapa	Sun and Beach	The Union Beach is situated on a river mouth. The opposite bank curves away on gleaming white sand, offering good view of a stunning landscape. It is deep enough for swimming and diving.
Union-Don Paulino Surfing Site	Dapa	Natural Wave	This area is an is an exposed reef break that has reliable surf. Relatively few surfers here, even on good days. Watch out for rocks.
Cloud 9 Surfing Site	General Luna	Natural Wave	The Cloud 9 Surfing Site has powerful waves that challenge surfers, both local and international, especially during the annual national and international surfing cup held every September/October.
Cloud 9 Boardwalk and Tower	General Luna	Leisure	The Boardwalk Cloud 9 offers a jaw-droppingly beautiful, magnificent,

ECOTOURISM SITE	LOCATION	TYPE	DESCRIPTION
			and unforgettable view of the Pacific and its breathtaking Cloud 9 waves.
Daku Island	General Luna	Sun and Beach	Daku Island is a beautiful island adjacent to Guyam Islet. Its excellent and white sand, pristine blue water, lofty coconut trees, and calming environment are known for its superb and white sand.
Guyam Islet	General Luna	Sun and Beach	Guyam Islet is a tear-drop shaped islet with a combination of rock formations and powdery-white sand and a cluster of coconut trees.
Naked Island	General Luna	Sun and Beach	An island free from vegetation. The Naked Island of pure white sand is perfect for basking in the sun and swimming and snorkeling. It was originally named as Pansukian island.
General Luna White Beach	General Luna	Sun and Beach	The Gen. Luna White Beach is a long stretch of sugar-fine white sand and stunningly sapphire seas, where one can view the tri-islands. A place for picnic and swimming.
Mam-on Island	General Luna	Sun and Beach	An excellent place for tourists looking for an uncrowded island/beach for swimming and snorkeling. The reef surrounding the island is truly remarkable.
Blue Cathedral	General Luna	Diving	The Blue Cathedral is an underwater rock formation with a vertical hole. Descending into it, one can find a sliding slope that leads to its two caverns- the North and East caverns. A large church's size looks like a cathedral because of sun rays entering the hole and the three entrances (a top hole, north and east caverns).
Tuason Point (Surfing Site)	General Luna	Natural Waves	Tuason Point is located within walking distance of Cloud 9 and shares many similarities, although it doesn't barrel as consistent as Cloud 9. The bottom is the same, going from deep to just inches of water at lower tides and breaks

ECOTOURISM SITE	LOCATION	TYPE	DESCRIPTION
			equally powerful and hollow. Some consider this the best left on the island but – just like Cloud 9 – it is not a long wave.
Jacking Horse (Surfing Site)	General Luna	Natural Waves	It offers a powerful wave that jacks on its peak and smashes onto the shallow reef, then reforms on the inner reef. It is best recommended to ride from medium to high tide—ideal surfing site for beginners.
Rock Island (Surfing Site)	General Luna	Islet, Natural Waves	Rock Island offers another right-hand break. The swell wraps around the base of a small rock island about 1.5 kilometers offshore. It hollows out and blows over superbly into high-speed sections that sometimes deliver two-meter rides.
Pansukian Reef (Surfing Site)	General Luna	Natural waves	The Pansukian Reef offers an open right-hand break that needs a swell of 2 meters or more to work. When the wave is big, it has a tremendous inside barrel section.
Sugba Lagoon	Del Carmen	Natural Lagoon, Leisure	The idyllic nature of Sugba Lagoon is located in the second largest mangrove system in the Philippines in the municipality of Del Carmen. This serene place is a perfect place for swimming, kayaking, stand-up paddle boarding, and relaxing.
Mangrove Forest	Del Carmen	Natural contiguous mangrove, cruise	The mangrove forest in Del Carmen is recognized by the Department of Environment and Natural Resources to be one of the largest contiguous mangrove forest in the Philippines. It is the home of the threatened species <i>Crocodylus porosus</i> or the saltwater crocodile. Overlooking the vast mangrove forest of Del Carmen is offered in the established Mangrove View Deck.
Our Lady of Mt. Carmel Parish Church	Del Carmen	Cultural	The Our Lady of Mt. Carmel Parish Church was established in 1635 by the early Spanish Missionaries. It is

ECOTOURISM SITE	LOCATION	TYPE	DESCRIPTION
			among the oldest outposts of Christianity in the Mindanao, and the oldest Parish of the Diocese of Surigao.
Kawhagan Island	Del Carmen	Sun and Beach	Kawhagan Island and Pamomoan beach are sugar-fine white sand and stunningly sapphire seas in Del Carmen. A place for picnic and swimming
Pamomoan Beach			
Magpupungko Rock Formation and Tidal Pools	Pilar	Sun and Beach	The destination offers limestone and granite sculptures facing the Pacific Ocean and pockmarked limestone floor, revealing pools of assorted shapes and sizes resembling basins, barrels, tubs, and ponds during low tide.
Maasin River	Pilar	River Cruise	An ecotourism spot famous for its bent coconut tree rope swing and river cruise.
Tayangban Cave Pool	Pilar	Natural	The Tayangban Cave's entrance is surrounded by freshwater, which can be very enjoyable for swimming.
Buhing Kalipay Blue Lagoon	San Isidro	Natural Lagoon	The Buhing Calipay Blue Lagoon is best for relaxation, sightseeing, research, and bird watching. It is identified as a source of irrigation to the ricefields and potable water supply in the locality.
San Isidro River	San Isidro	River Cruise	The wide San Isidro River serves as the belt of the place. Locals offer a relaxing river cruise.
Sabang Beach	San Isidro	Sun and Beach	The waves in Sabang beach are relatively calm, providing a good beach experience for swimmers, divers, and picnic lovers. Most beaches here are white sand, but this one is a rocky beach but is still safe for non-swimmers.
Poneas Hilltop Lake	San Benito	Natural Lake	A mountain top lake which is home to different species of freshwater fish. The lake's basin area is approximately three hectares and has a depth of 37 feet. Its seemingly

ECOTOURISM SITE	LOCATION	TYPE	DESCRIPTION
			bottomless water reflects a mirror-like panorama of blue heavens, green hills, and silver gleam of tiny fishes darting the water. Poneas Hilltop Hidden Lake is a vision of sylvan serenity.
Pagbasayan Islet	San Benito	Sun and Beach	The Pagbasayan Islet is a 7.5-hectare islet of white sand surrounded by a vegetation of seaweed plantations. Its shallow clear waters are best for swimming for children. The islet can be reached through a 15-minute pump boat ride from the Poblacion.
Kangkangon Beach	San Benito	Sun and Beach	The Kangkangon White Beach boasts of its white sand and crystal clear water, water sports, and recreation potential. It is also suitable for sunbathing and night swimming.
Campayas Vanishing Island	San Benito	Sun and Beach	The seductive beauty of this island is displayed during mean low tides. It is surrounded by healthy groomed seagrass and a wide array of corals.
Taktak Falls	Sta. Monica	Natural Falls	The gentle burst of Taktak's falling water amid the tropical forest's tranquility makes the environment conducive for nature lovers.
Alegria White Sand Beach	Sta. Monica	Sun and Beach	This seven-kilometer unspoiled white sand beach area is suitable for swimming and diving.
Hagukan Dive	Sta. Monica	Diving	The Hagukan Dive is supplemented with a seven-kilometer white sand beach known as a good diving site.
Tangbo Surfing	Sta. Monica	Natural Waves	Tangbo surfing area gives one excitement for those calm waves, though is not as big as waves like in Cloud 9 or Pacifico, this surf spot always wanted by the foreign tourist because it's not crowded and has a peaceful ambiance.
Sohoton Cove	Socorro	Natural Cove	This enchanting cave is half-submerged in the water most of the time and is accessible only during

ECOTOURISM SITE	LOCATION	TYPE	DESCRIPTION
			low tides. Inside is a lagoon with crystal waters and several islets.
Jellyfish Kingdom	Socorro	Leisure	This sanctuary is located near the Sohoton Cove and is famous for being a home of friendly, stingless jellyfish.
Magkukuob Cave and Cliff Diving	Socorro	Cliff Diving	The Magkukuob is a small cave that one needs to enter when decided to take a cliff dive.
Hagukan Cove	Socorro	Natural Cove	During low-tide, the Hagukan Cove is accessible to tourists, but during high tide, one will have to dive to enter the cove. The cove and its water generate a snoring sound, translated as "hagok" in the local dialect.
Tiktikan Lake and Sohoton Gamay	Socorro	Natural Lake	The Tiktikan Lake is composed of 3,973 hectares of greenish-blue brackish waters of the muddy and silted bottom. It is also surrounded by thick forest, making this an ideal trekking destination. Sohoton Gamay offers a clear blue water ideal for swimming and other water activities.
Bolitas Cave	Socorro	Natural Cave formations	This cave has a very small opening that can be entered by sliding through it. Inside, one can find very small stalactites and stalagmites like droplets of water and candles dripping.
Magkahuyog Falls	Socorro	Natural Falls	The Magkahuyog Falls showcases the beauty of flowing water from the forest of 150 meters above sea level. It cascades its water down to the beach.
Marka-A White Beach	Socorro	Sun and Beach	This shaped "A" islet has fine sand and pristine water perfect for swimming and sun bathing.
Hundred Islands	Socorro	Natural Island Formations	A group of Islets which are home of various bird species. One can enjoy the opportunity of bird watching on the site.

ECOTOURISM SITE	LOCATION	TYPE	DESCRIPTION
Tundan Cave	Socorro	Natural Cave Formations	A beautiful cave of breathtaking stalagmites and stalactites.
Colorum Uprising	Socorro	Educational, History	On the western part of Poblacion Socorro is Barangay Pamosaingan, the site of the Colorum rebellion and where the American Constabulary Mass Grave Yard is found.
Bobon White Islet	Socorro	Sun and Beach	An Islet of powdery-white sand which has pristine water good also for snorkeling.
Crystal Cave	Socorro	Natural Cave Formations	The Crystal Cave offers amazing stalactites and stalagmites. Some portions of its glittering walls resemble a mermaid's tail, and other portions look like sparkling wall drapery.
Kanlanuk Bay and Falls	Socorro	Sun and Beach; Natural Falls	An ideal place for family vacation or team-building activity. One should trek from the bay or private resort/accommodation to reach the Kanlanuk falls. The place is uncrowded and tranquil.
Eco-Grande Park	Socorro	Camping	Eco-Grande Park is privately owned, which offers a peaceful environment and accommodation surrounded by green vegetation. It also has a swimming pool and perfect for camping and family/group vacation.
Kawasi Waterfalls	Socorro	Natural Falls	Unique waterfalls which became cleaner and astonishing through the efforts of a people's organization. It is said that its water is miraculous. The whole place is very serene and relaxing. One needs to contact the Municipal Tourism Office before going to the place.

ANNEX 15

List of Tourism Facilities in SIPLAS

LIST OF TOURISM FACILITIES	
GENERAL LUNA	
Dirk Siargao Villas	Gabisan Homestay
Kawili Resort	Viller Juan/Griffins Guesthouse
Lucy's Homestay	Ahoy Island Paradise
Dream Catcher Nipas	Reside Siargao
Treehouse / TheLiving Room	Pepito's Place
Strangers Inn and Bar	The Ilcapo
Peri-Peri Chicken Grill and Resto	Discovery Siargao Project
Eco Hotel	Ojen Villa
Oso Hostel	Sentro Suites
Himaya Beach Resort	The Elvira C. O'Shea
Natalia Luz Hostel	Tulua Villa
Caracoa Resort	Gab-Gab Residency
Micasa Suite	Kaimana Beach Resort
Premiere Haven Hostel	Black Balay
Tropic Hostel	RGJA's Homestay
Buko Garden Homestay	Casa Adlao
Bearby Homestay	Coconut Home
Rose Pike	Paglaom Hostel
Maison Bukana	Big Belly Restaurant
Villa G	Triangle Palm Villas
Clohaki Hostel	Aloha Hostel
Tropical Villa	Bayud Resort
Loko Loco Bar and Restaurant	Kalipay Resort Application
Salt Bungalows	HUE HOTEL SIARGAO
Azumar Resort Siargao	Mera's Garden Resort
Vivo Inn Resort	Nine clouds homestay and restaurant
2-storey Hostel of Manisha E. Mahtani	Ohana siargao guest house
Isola de sole villas and resort	Emelia's restobar
Kawayan Siargao Resort	Casa Buho Hostel
Malinao View Beach Resort	Habilin Villas
Nico Homestay	Hotel and Restaurant by Nice Guys Inc.
Gana Siargao Island	Bajala Hostel
Strawberry Homestay	Pappsen's Guesthouse
Ohana Resort	Siargao Traveller's Beach Resort
Villa Pagoda Resort	Riad Masaya Homestay

LIST OF TOURISM FACILITIES	
Focalpoint Haven	Lampara Glamping and Cabins
Sandy-feet Village	Villa Peray Homestay
Maggie Mae Resort	Koko Halo Villas
El Campo	Ma. Razil Homestay
Lukay Homestay	Red Dot Guesthouse
Siargao Homely Homestay	Eme's Apartelle
Delma D. Andales Homestay	J & V Beach House
Tessie Homestay	Miramar Residencia
Ernan Homestay	Mama's Grill
The Space	Raul No Uchis
Lyn's Homey Place	Bulaloan sa Bankerohan and Homestay
Moy Moy's Inn	RL's Bake Café
Daltan's Homestay	Anirada Homestay
Joe and Ding Homestay	Harry's Burger Corner and Hostel
2G Green Homestay	Coco Pod
Viento Del Mar Resort	Hiraya Surf Hostel
Kaza Boutique Hotel	Surch Restaurant
Lunares Café and Guest House	I Love Siargao Resort
Maria Tavern Island	Las Nenas Place
Edessa Homestay	Tuazon Villa
Tersario Retreat Apartelle	Villa Solaria
Jerovir Apartelle	Buddha's Surf Resort
Shaka Cake	Karma Guest House
Paradise Bed and Brew	Sadhana Siargao
Happiness Siargap	Bulan Villas
Suyog Hostel	General's Hostel and Café
Kulto Siargao Soul and Flow Homestay	Surfing Temple Resort
Tawin-tawin Farmers Association	La Boheme Hostel
Tropical Vibes Inn Siargao	Dahun Villas
Rum Bar	Diwa Siargao
Cave Wave Surf Lodge	IPV Homestay
Siargao Cliff Villas	Siargao Sunshine Holding and Company Homestay
Jazzeal Holiday Villas	Pepayen Homestay
Tomaides Place Homestay	2-Storey Commercial Building
Don Remegio Villas	Panawan Guest House
Isla Mercato Food Park	Seag Grass Apartment

LIST OF TOURISM FACILITIES	
Robotica Homestay	JMT Star's Inn 2
Noya Hostel	JMT Star's Inn 1
My Fresh Greek Taverna	Solenn's Homestay
M & B Tourist Homestay	DRB Homestay
Siargao Single Fin	TLShaw Homestay
Jeannine Residence Homestay	Paradiso Homestay
Lumad Hostel	Astoria Hotel
Dre's Place	Palmas Siargao
Casey's Homestay	Sardo Restaurant
Hotspot	I love Siargao Hostel and Resort
Zicatela Resto	Yara Homestay Pension House
Sunflower House Siargao	Las Palmas Villas & Casitas
2-Storey Commercial Bldg	Andok's Restaurant Siargao
Junsims Chalet	Secret Spot Eco-Hostel
Sheandy's Hostel	Shakabrah Resto Bar
Litsonera Grill and Bar	Bernandina Restau Inn
Vedas Hostel	Maya Villa Homestay
Siago Beach Resort	G Villas Homestay
Blauset Resort	Cogon Resort
Surfing Carabao Beach House	Kawa Beach Resort
Soul Tribe Beach Resort	L Jr C Homestay
Villa Consolacion Resort	Angel Water Refilling Station
Warung Island Villas	Nids Homestay
Ronaldo's Inn and Restaurant	Harana Surf Inc
Palaka Resort	Hostel and Café of Ma Suzette F. Abela
Sevilla Homestay	Hola Cow Homestay
Siargao Sunrise Villa	Dormitel of pops District Corp
Mad Monkey Hostel	Cherinicole Beach Resort
Isla Cabana	Palm Paradise
Arka Hayahay Resort	Siargao Inn
Siargao Bleu Resort and Spa	Palm Paradise Island Resort
Kalinaw Beach Resort	Jadestar Lodge
Kermit Surf and Dive Camp	Eddies Beach Resort
889 LH Bry Lodge	Bianney's Homestay
Cloud 9 Boardwalk	Buddha Surf Resort
Chillact Siargao Bar and Beach Resort	Cabontog

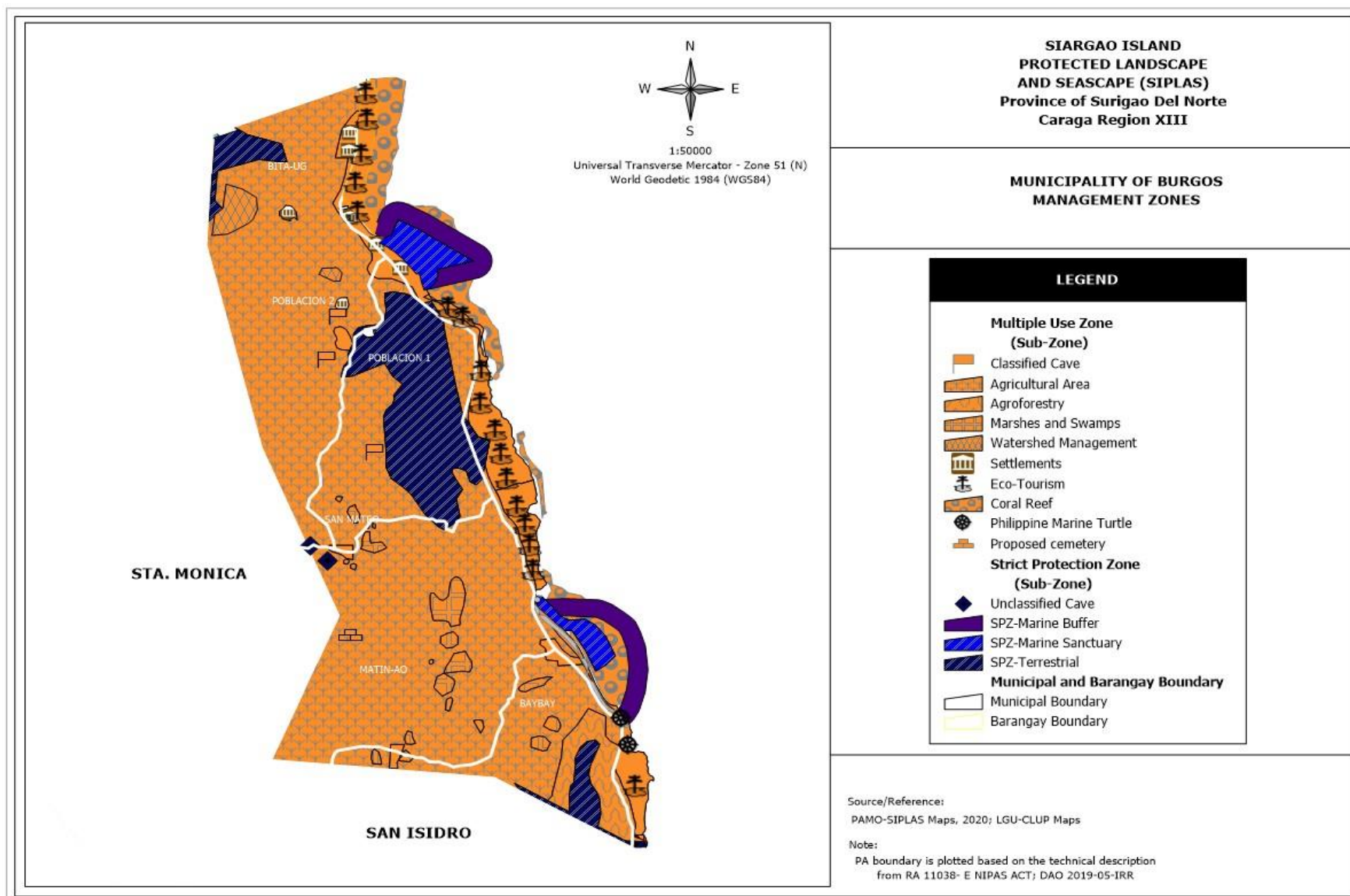
LIST OF TOURISM FACILITIES	
Daku Resort	Dedon Island Resort
Drift Wood Surf Shop	Emerald house
Epefania C. Petajo Homestay	Gemelina Resort
GL Provincial Training Center	Gubaton Residence
Honda Pacific Beach Resort	Jing Gurabat Homestay
Jungle Reef Surf Resort	Kawayan Resort
Kawili Beach Resort	Kesa on Cloud 9 Resort
Kokai Resort	La Luna Island Resort
Mahogany Resort	Matanjak Homestay
Ocean 101	Ocean Pacific Inn
Ocean Ridge	Paglaum Hostel
Pagoda Resort	Palm Paradise Island Resort
Pansukian Beach Resort	Patrick's on the beach
Pesangan Lodge	Pesangan Surf Camp
Pesangan Resort	Volpe Homestay
Point 303 Resort	Rambeu
Reef Beach House	Romantic Beach Villas
Ronaldo's Inn and Resto Bar	Rutchel M. Alipayo Homestay
Sagana Resort	Shat's Guest House
Siargao Residence	Tiki Bungalows and Bar
Traveler's Pension Hauz and Beach Resort	Carlo S. Tanseco & Enrique Serafin A. Soler Residential and Villas
Villa Maya Homestay	Wave Cave Lodge
Wayfarers Cloud 9 Restaurant	Yanyan's Small Hut
Rucksack Inn Siargao	Turtle Surf Camp
Tarzan's House	Casa Bianca
May Ann Homestay	Salig Inn
Yayay Homestay	Broken Board Homestay
Asgard Resort and MMA Gym	Seaclub Philippines
Puraw Loft Siargao	Dodong Homestay
Alpas Hostel	Fat Lips
Hillside Resort Siargao	Seasalt Apartment Rental
Romicha Villa	Serenity Haven
Haole Surf Hostel	Ocean 202 Homestay
Alakai Hostel	Sophie's Homestay
Bluebee Homestay Siargao	Mango Tree Siargao
Alaala Villa	Café and Surf Shop

LIST OF TOURISM FACILITIES	
Alicia Hostel	Siargao Freedom
Jolan Homestay	Woody's Place
BUI-TU-NGA	
Villa Aurora Homestay	Sweet Home Hostel
BURGOS	
Municipal Tourism Reception Center	Local Stay
Bollox Beach Resort	Cecilia Homestay Villas
Whitesands Beach Resort	Jenjen's Seaview Beach Resort
Bunzo Beach	
DAPA	
Bayay ni Xian Homestay	Dendit Homestay
Ian Ella Homestay	Payag ni Juan
RC Lancy Homestay	D'Islanders Ville Pension House
MNRB Pension House	MEMS Pension Hauz and Restaurant
Paradise in the Pacific	Dapa Tourist Inn
Tag-Ayaran Valley Resort	Isla Haruhay
La Vista Del Mar	Garcia Guest House
RSK Beach Resort	Comahig Beach House
Dapa Island Resort	Katikipan Beach Resort
DEL CARMEN	
Bakhaw Bed and Breakfast Hostel	Romy Laosinguan Home Stay
Eco Park of Del Carmen	Siargao Mini Crocodile Park
Nabaliskad Family Resort	
STA. MONICA	
Alegria Paradise	Platil Lodging House
Banday Beach Resort	S O S
Pagaran Lodging House	Da Rosa Del Mar Beach Resort
Kaha Island Hostel	Jungle Garden Guesthouse
PILAR	
Cometa Residence	Santiago Gonzales Residence
Hiyasmin Gonzales Residence	Soloso Residence
Lucod Beach Resort	Kaalwanan Villas
Profondo Resort	
SAN ISIDRO	
Maalon Beach Resort	Bamboo Resort
Big Waves Resort	Bollox Bar

LIST OF TOURISM FACILITIES	
Jafe Camp Surf and Sail Resort	Sailfish Bay Garden
Bamboo Garden Bar and Lodging	Lantaw
La Finca	Hightide Eco Villas
Freedom Society – Container Guesthouse	Five Waves Resort
Trogons Perch Resort	Wantaw Homestay
Pacifico River House	La Freyah's Homestay
SAN BENITO	
MLGU San Benito Zipline, Wall Climbing and Rappelling	
SOCORRO	
Hidden Island Resort	Club Tara Resort
Dagatan Cove Resort	

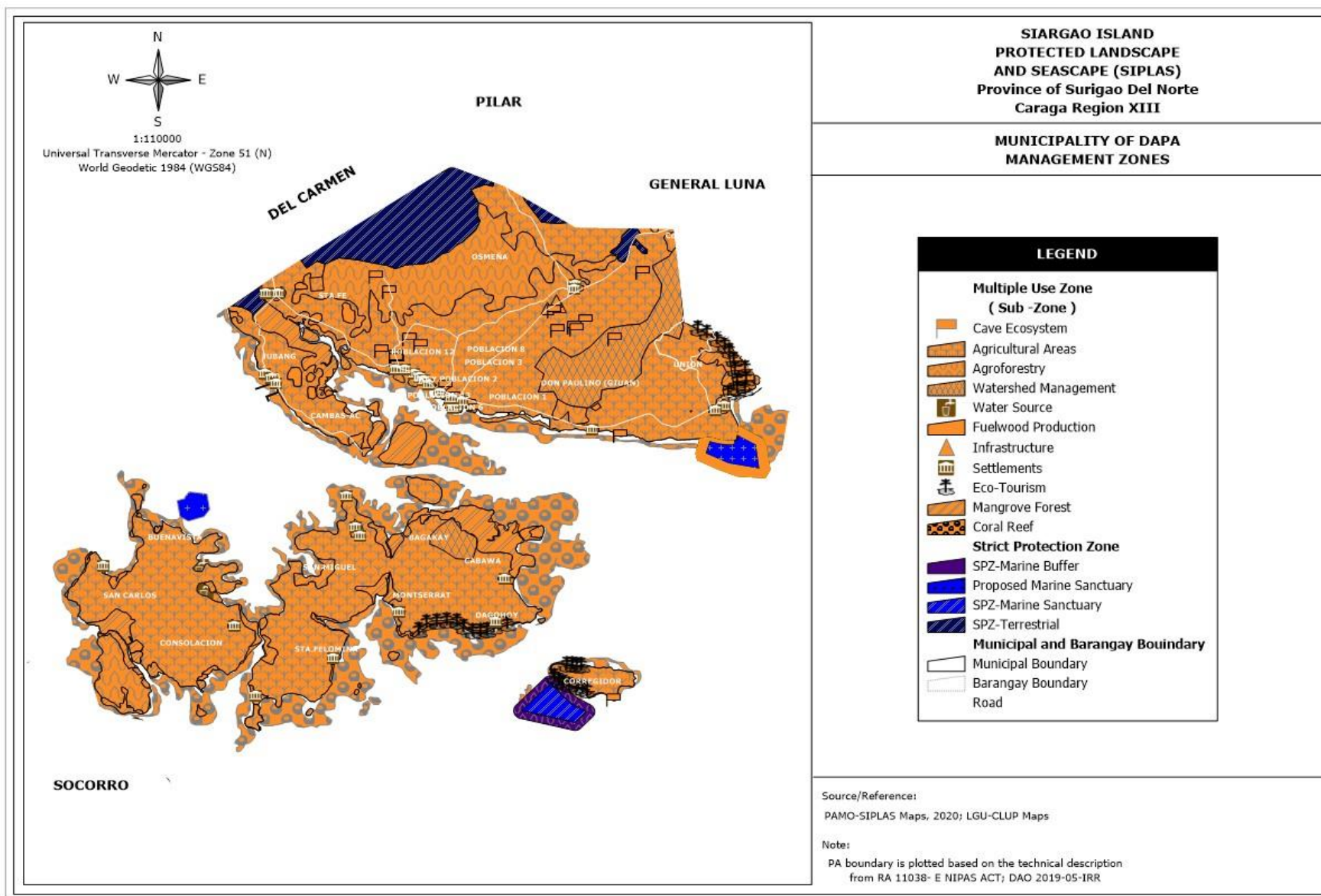
ANNEX 16

Management Zones per LGU within SIPLAS



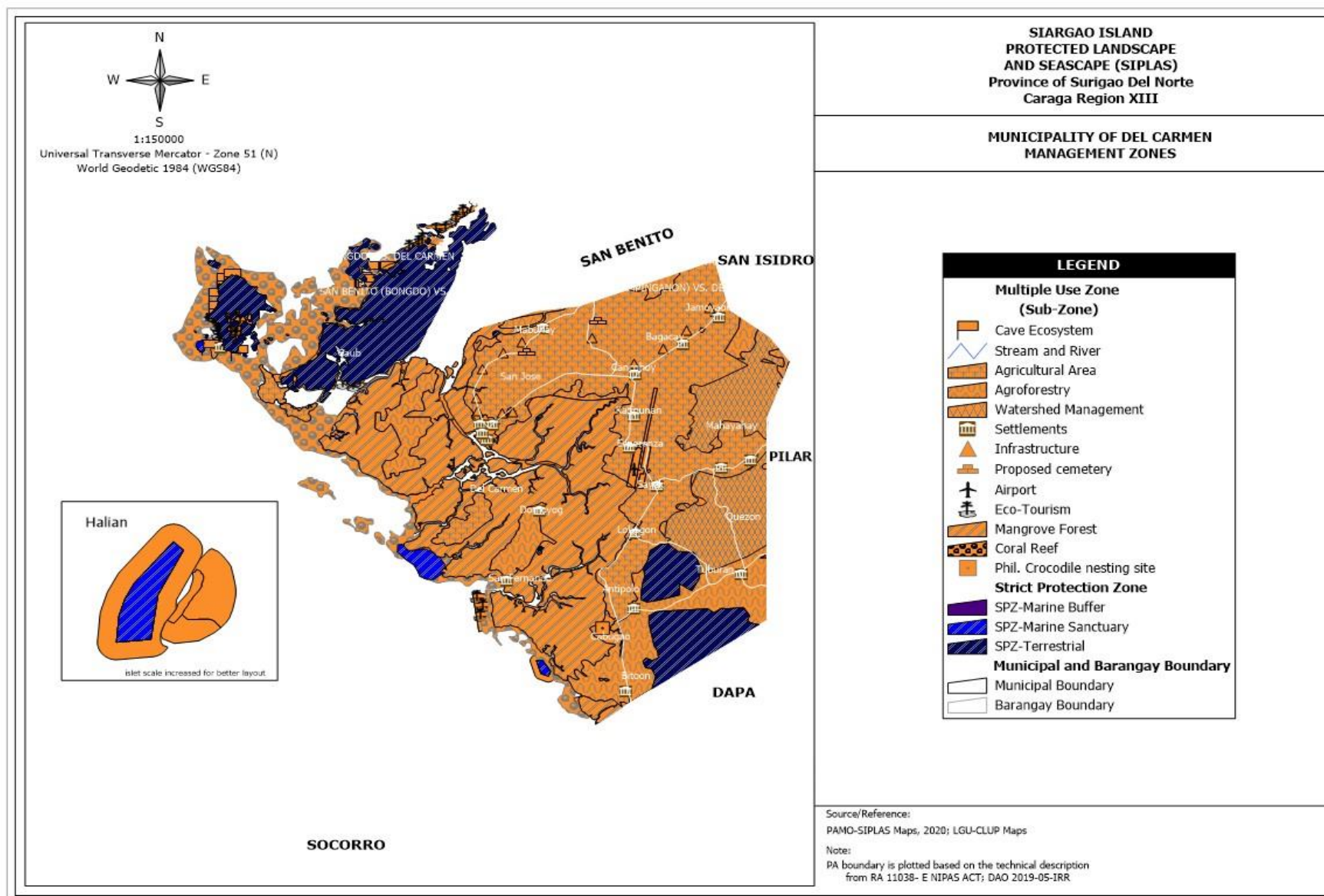
Annex 16.1. Management Zones for the municipality of Burgos, Surigao del Norte

Source: SIPLAS-PAMO CY 2020



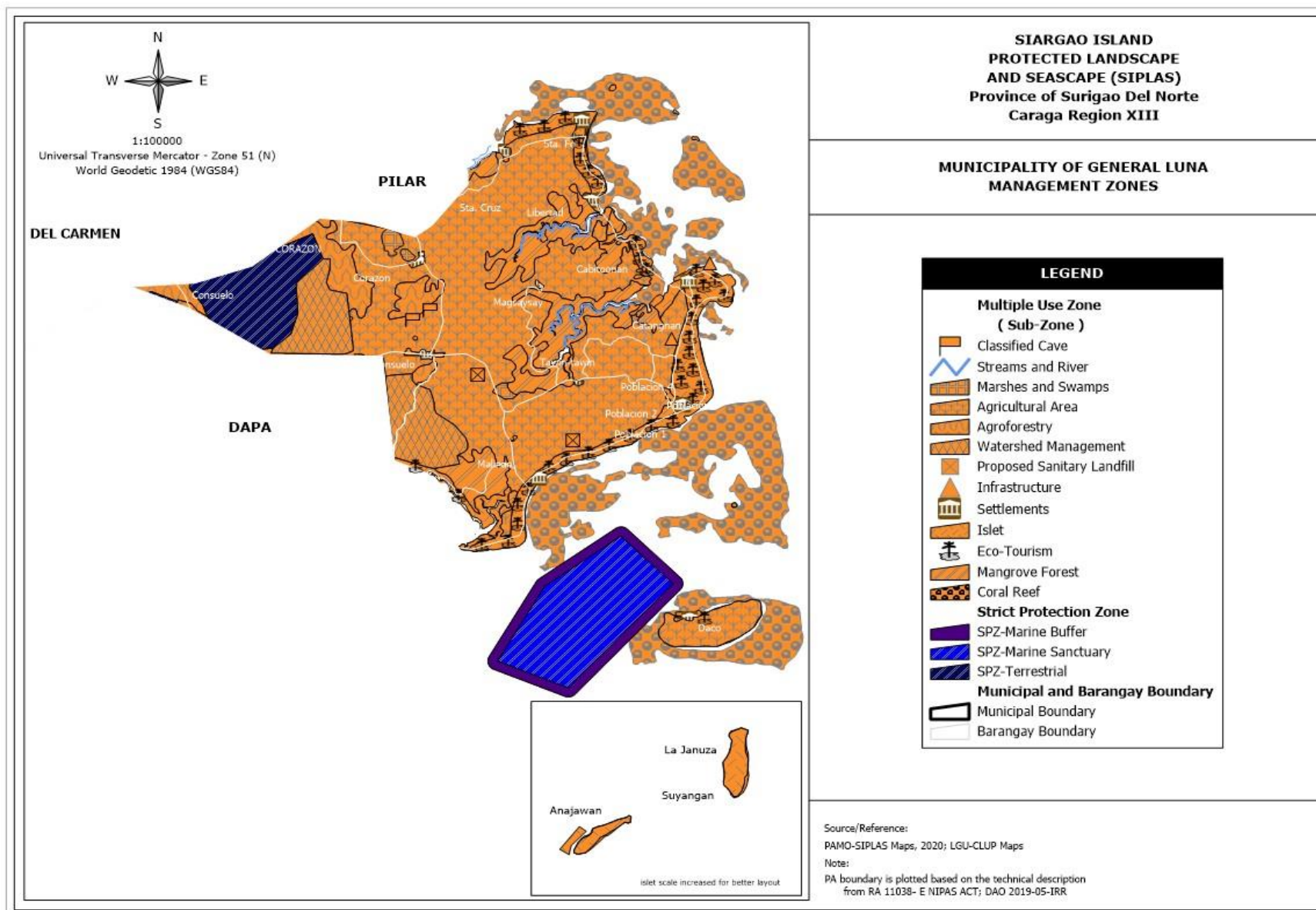
Annex 16.2. Management Zones for the municipality of Dapa, Surigao del Norte

Source: SIPLAS-PAMO CY 2020

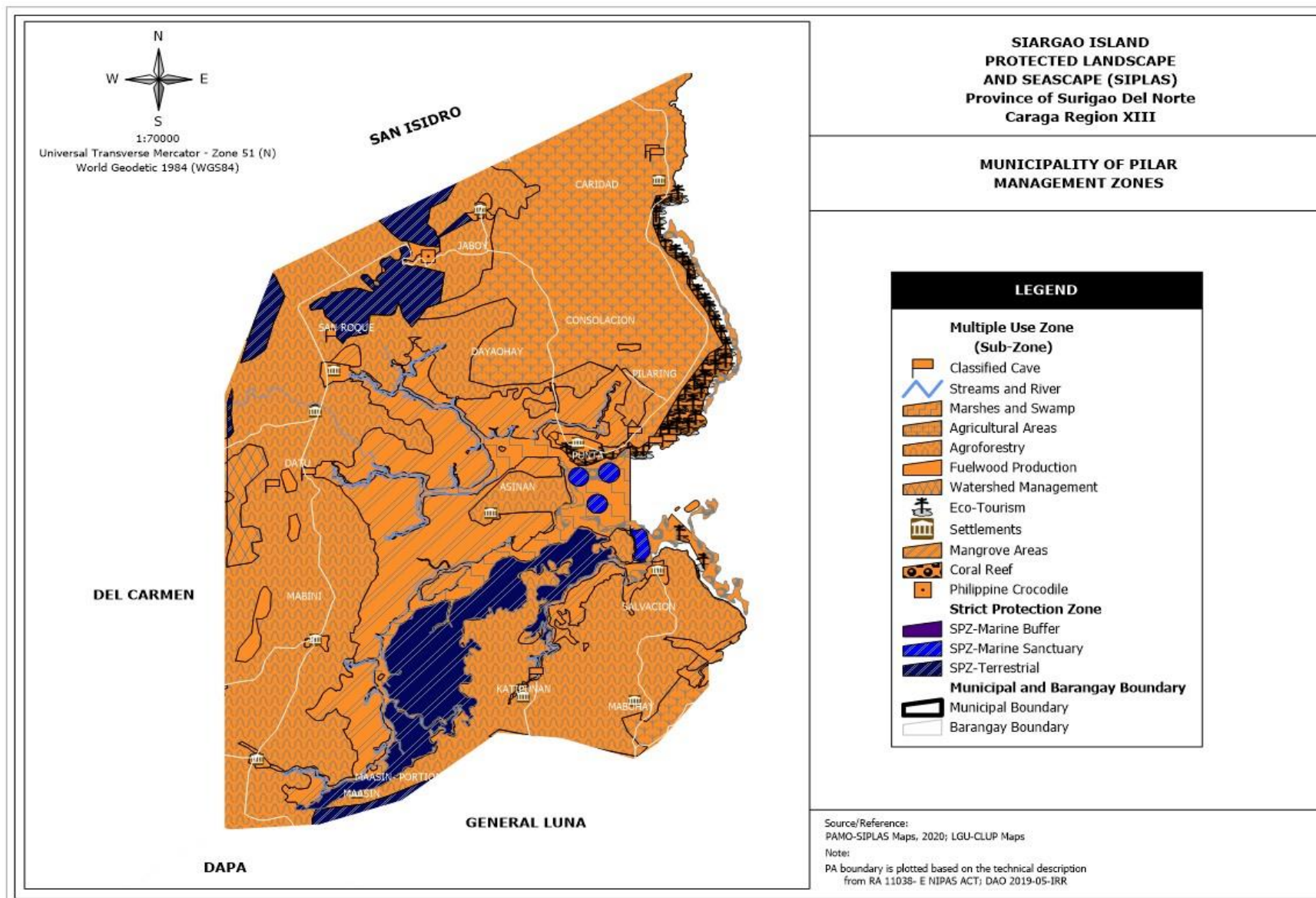


Annex 16.3. Management Zones for the municipality of Del Carmen, Surigao del Norte

Source: SIPLAS-PAMO CY 2020

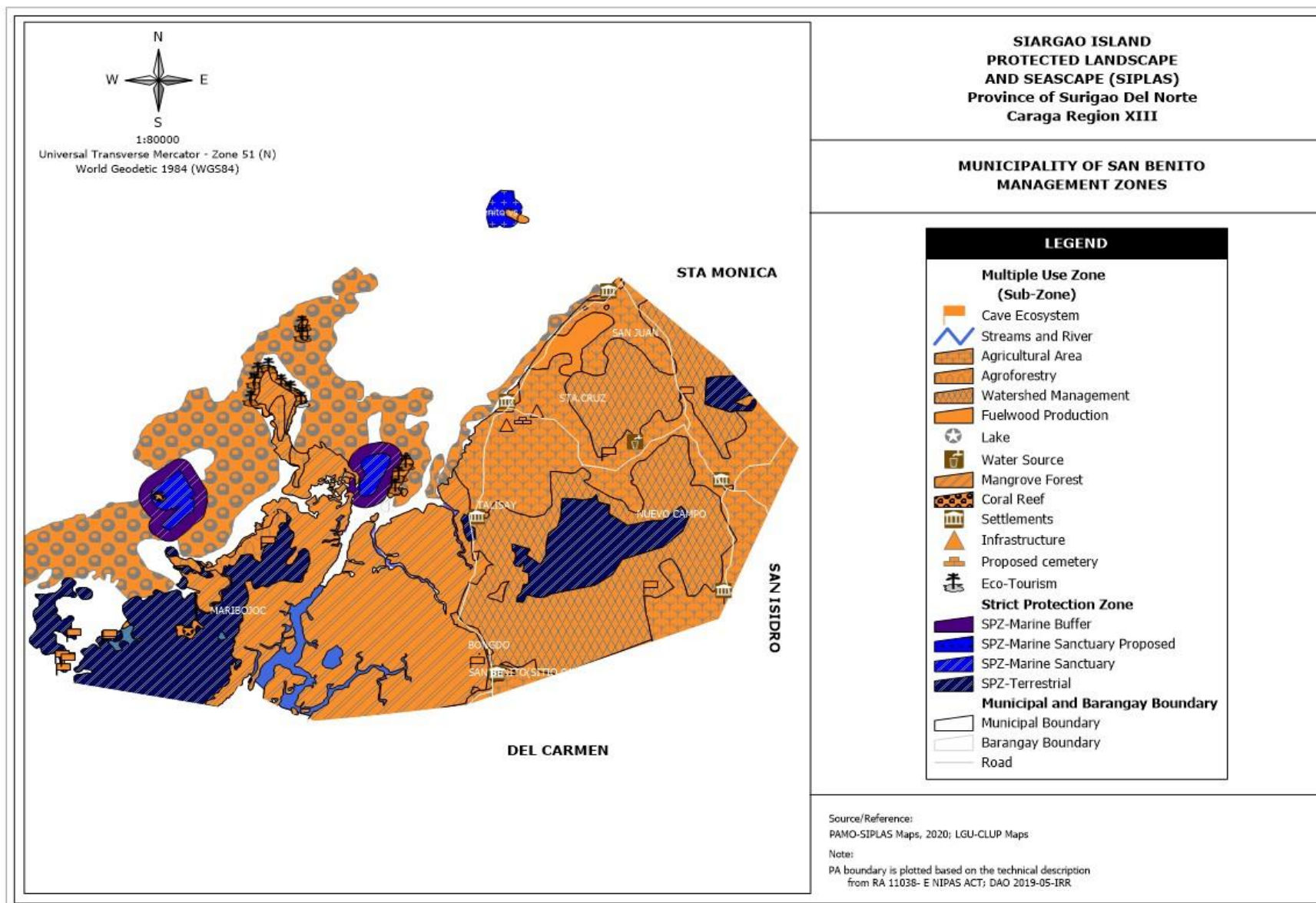


Annex 16.4. Management Zones for the municipality of General Luna, Surigao del Norte



Annex 16.5. Management Zones for the municipality of Pilar, Surigao del Norte

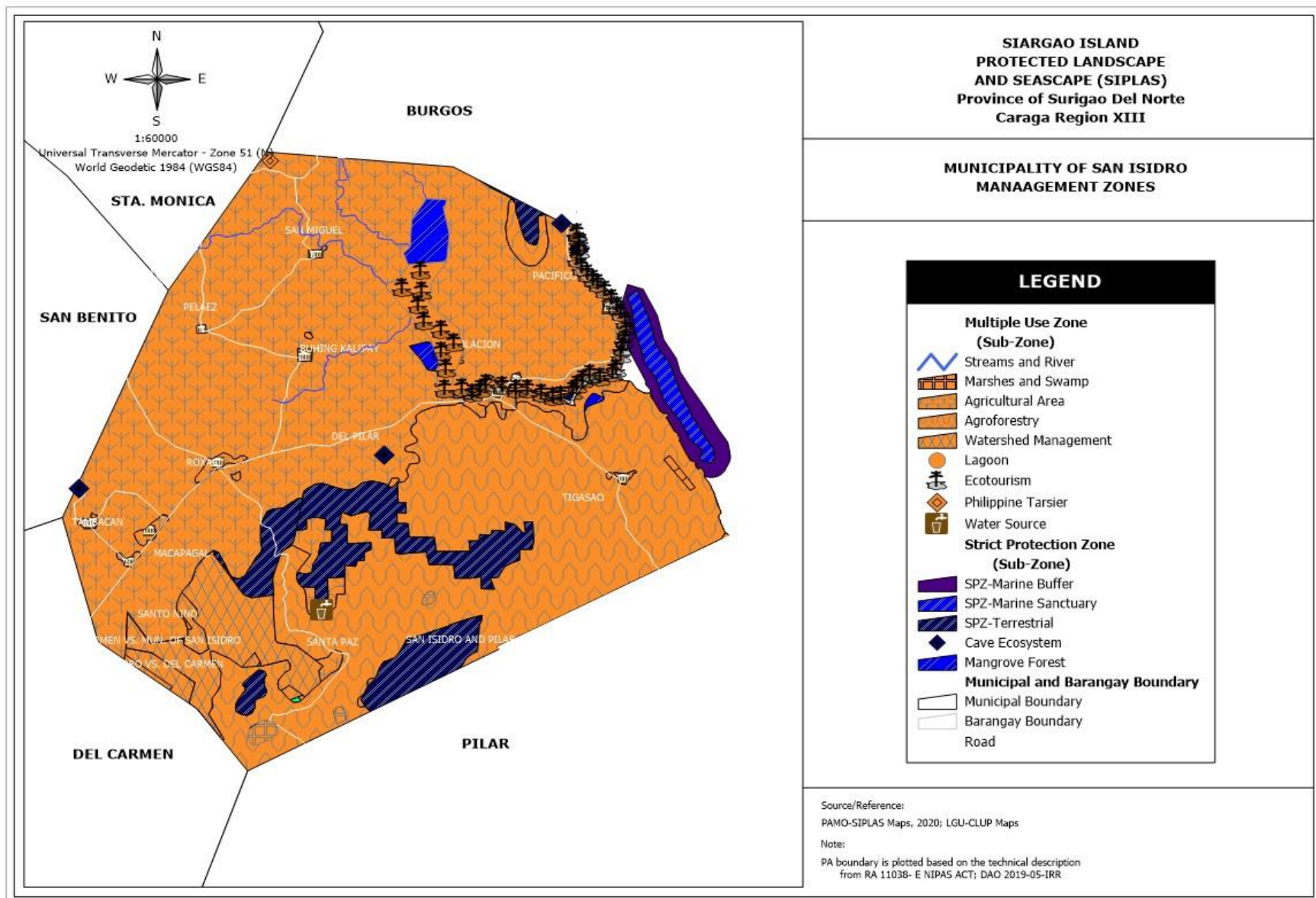
Source: SIPLAS-PAMO CY 2020



Annex 16.6. Management Zones for the municipality of San Benito, Surigao del Norte

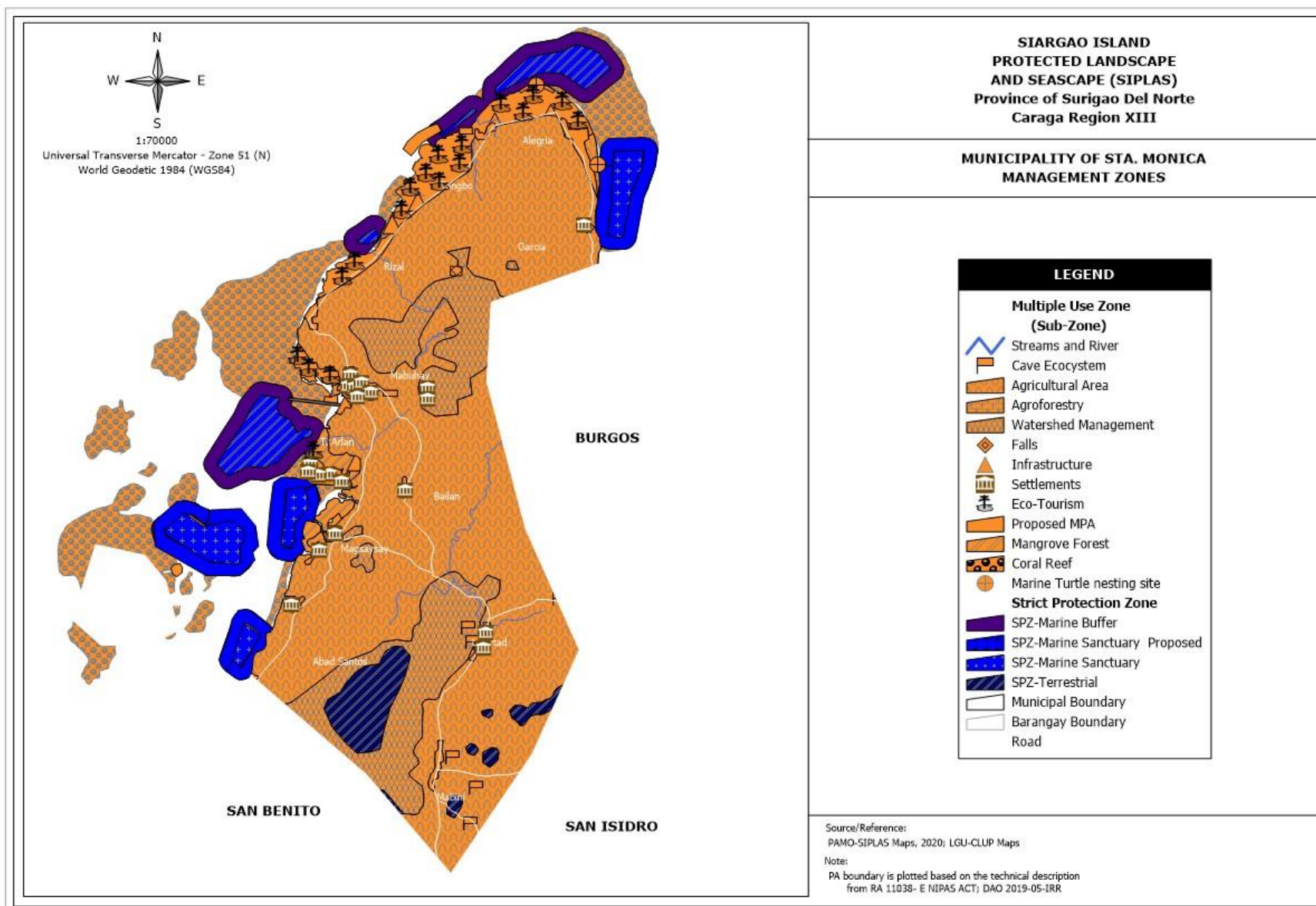
Source: SIPLAS-PAMO CY 2020

SIPLAS Management Plan CY 2021-2030



Annex 16.7. Management Zones for the municipality of San Isidro, Surigao del Norte

Source: SIPLAS-PAMO CY 2020



Annex 16.9. Management Zones for the municipality of Sta. Monica, Surigao del Norte

Source: SIPLAS-PAMO CY 2020