



DAVAO DEL NORTE INTEGRATED COASTAL MANAGEMENT PLAN

2018-2023





Republika ng Pilipinas
Lalawigan ng Davao del Norte

Sangguniang Panlalawigan

Legislative Building, Mankitam, Tagum City, Davao del Norte



EXCERPTS FROM THE MINUTES OF THE 47TH REGULAR SESSION OF THE SANGGUNIANG PANLALAWIGAN OF DAVAO DEL NORTE (TERM 2016-2019) HELD AT THE SESSION HALL, PROVINCIAL GOVERNMENT CENTER (CAPITOL), TAGUM CITY, ON MONDAY, NOVEMBER 26, 2018

Present:

Hon. Alan R. Dujali, DFRIPAR	Vice-Governor (Regular Presiding Officer)
Hon. Shirley Belen R. Aala	Member
Hon. Roy J. Catalan	Member
Hon. Vicente C. Eliot, Sr.	Member
Hon. Ernesto T. Evangelista, Sr.	Member
Hon. Hernanie L. Duco	Member
Hon. Raymond Joey D. Millan	Member
Hon. Jannet N. Tanong-Maboloc	Member
Hon. Francisco C. Remitar, MDMG	Member
Hon. Alfredo B. De Veyra III	Member
Hon. Dindo C. Parangan	Member/FABC
Hon. Marcial B. Lig-onan	Member/IPMR

On Official Business:

Hon. Rodolfo G. del Rosario, Jr.	Senior Board Member
Hon. Dan P. Gervacio, REE	Member /PCL
Hon. Emerson Dave A. Silutan	Member/SKPPF (Baguio City)

Absent: None

Sponsors: Hon. Roy J. Catalan, Hon. Shirley Belen R. Aala, Hon. Vicente C. Eliot, Sr., Hon. Ernesto T. Evangelista, Sr., Hon. Hernanie L. Duco, Hon. Raymond Joey D. Millan, Hon. Jannet N. Tanong-Maboloc, Hon. Francisco C. Remitar, MDMG, Hon. Alfredo B. De Veyra III, Hon. Dindo C. Parangan and Hon. Marcial B. Lig-onan

RESOLUTION NO. 914

APPROVING THE PROVINCIAL FOREST LAND USE PLAN (FLUP) 2018-2023 OF THE PROVINCE OF DAVAO DEL NORTE

WHEREAS, a letter dated November 21, 2018 of Hon. Antonio Rafael G. del Rosario, Governor, this Province, duly received by the Office of the Secretary to the Sangguniang Panlalawigan on November 26, 2018, endorsed to this August Body, PDC Resolution No. 18, series 2018 of the Provincial Development Council (PDC), this Province, was presented for appropriate action;

WHEREAS, the Forest Land Use Plan is a framework plan formulated by the FLUP Provincial Technical Working Group in coordination with the Provincial Environment and Natural Resources Office (PENRO-LGU) to provide direction in the sustainable development and management of forests and forest lands and supports the goal of the provincial government to build a better future for the next generations by supporting significant interventions and engaging the participatory role of the community as active stakeholders;

WHEREAS, the said plan takes into consideration the proper use of forest resources in the Province with emphasis on the allocation of forest lands in their appropriate uses consistent with the existing biophysical conditions and socio-economic, cultural and political realities;



Republic of the Philippines
Province of Davao del Norte

OFFICE OF THE SECRETARY TO THE SANGGUNIAN



PROVINCIAL ENVIRONMENT &
NATURAL RESOURCES OFFICE
RECEIVED
DATE/TIME: DEC 17 2018 2:51 PM
BY: *[Signature]*

INDORSEMENT
December 17, 2018

Respectfully transmitted to Mr. Romulo D. Tagalo, M.M., Provincial Environment and Natural Resources Officer, Provincial Environment and Natural Resources Office, this Province, copies of Resolution Nos. 914 and 915, both dated November 26, 2018 of the Sangguniang Panlalawigan of Davao del Norte.

For his information and reference.

[Signature]
DENNIS DEAN T. CASTILLO, MPA
P G Department Head

Transmittal No. 110/
Date 12/14/18
Record Officer _____

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Legislative Hall, Mankilam, Tagum City 8100 | Voice Line: (084) 216-4439 or 0910-5387161/0965-0666240

WHEREAS, the said plan takes into consideration the proper use of forest resources in the Province with emphasis on the allocation of forest lands in their appropriate uses consistent with the existing biophysical conditions and socio-economic, cultural and political realities;

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Executive Summary

An integrated approach that considers both land-based activities—such as deforestation, industrialization, and urbanization—as well as direct impacts of coastal resource uses, such as fishing, aquaculture, and ecotourism has been taken through the Provincial Integrated Coastal Management Plan (PICMP). It is a five-year plan that shall pave the way of the province to better manage its coastal resources. It **sets the direction** and **basis for action and implementation** of all coastal management programs or projects in collaboration with coastal local government units.

The Plan is not a consolidation of the ICM Plans of its coastal cities and municipalities. However, it aims to ensure that all ICM plans are complementary thus stakeholder participation is at the core of the planning process. Key personalities and stakeholders coming from the government, business sector and civil society boost the plan formulation process with a series of workshops, consultations and write-shops.

The Plan has six main parts. **Chapter One** explains further of its context and rationale, shows the process of its formulation and planning framework, and provides its scope and limitations. **Chapter Two** describes the coastal environment of Davao del Norte. It presents in detail the biophysical and social profile of the coasts including the state of its resources. **Chapter Three** provides a picture of the issues and concerns associated with coastal management. **Chapter Four** discusses the goals, objectives, strategies and targets for key results areas covering Coastal Land Use and Zoning, Fishreies and habitat Management, Livelihood and Enterprise Management, Research and Institutional Development, Coastal Resources Awarenes and Waste Management and Pollution Control. It further lays down the Five-year Investment Target of the Province. **Chapter Five** provides the frameworks, mechanisms and systems necessary for effective implmentation and monitoring and evaluation of the plan.

Coastal Environment

Davao del Norte has a four (4) coastal local govenrment units and 42 coastal barangays. It has a shoreline of 145. 43 km with a total municipal waters of 111, 023.20 sq.km. There are six (6) major rivers draining to its coasts with a total combined length of 467 kms. About 13% of the population of Davao del Norte reside in the coastal barangays.

composed of municipal fisheries and aquaculture which has been increasing over a three-year period from 2014-2016.

Coastal Resources Management Challenges

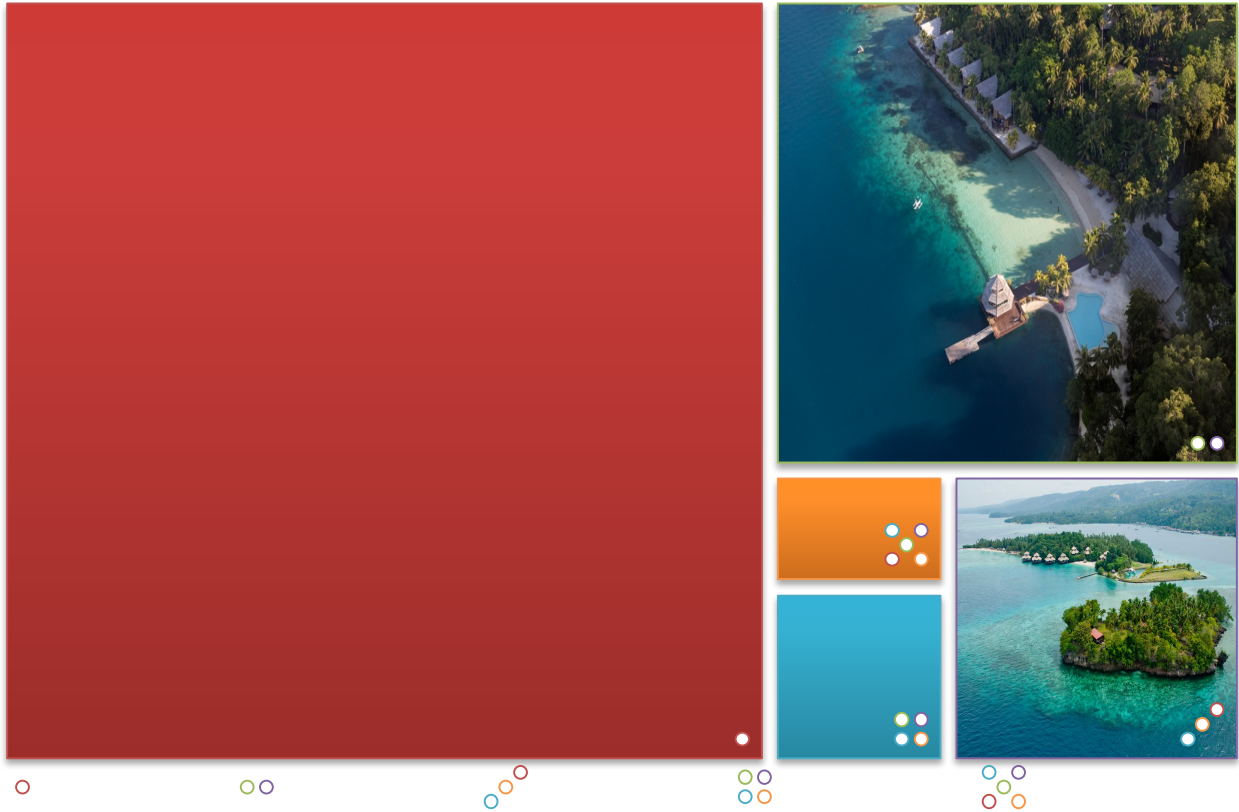
Declining water quality, illegal and destructive fishing methods, improper solid waste management and habitat degradation remains to be the main environmental threats plaguing the coasts. Several key issues regarding institutional arrangements and responsibilities for the implementation of coastal and fisheries legislation are also identified. These include proliferation of informal settlers, Multiple-use conflicts, Climate Change and Disaster Risk And Weak Governance and Management. At the provincial level, the lack of a database for coastal information has slowed effective planning and decision-making.

Direction, Goals and Investment

To effectively address issues and concerns in coastal resources management, programs and projects are identified in a five-year investment targets. These programs and projects are expected to cause development in five (5) Key Result Areas. These key result areas directly contribute to the BEST PEOPLE Development Agenda and subsequently, the Sustainable Development Goals.

Implementation arrangements

The implementation of the Five-year Provincial ICM Plan of Davao del Norte calls for support by a wide range of government agencies at the local, provincial and national levels. A Program Coordinating Committee will be created to maximize collaboration and complementation of projects across implementing units and agencies. Imperative in every PPA is to know the progress of its implementation in order to also assess its impact to its end-users. Logical Framework Matrix and Results Chain are utilized.



I. Introduction

1.1 Rationale

The coastal area of Davao del Norte is not as vast or productive as that of the other provinces in the region. Nevertheless, it is incomparable and is one of the province's prime tourism assets. Apart from being home to a significant portion of the province's population it hosts a great diversity of industrial and recreational activities, each playing an important role in the province's and the region's economy. Unfortunately, many serious problems exist in Davao del Norte's coastal areas compromising the natural productivity of these resources.

Given the most common development pressures on coastal areas and the competition for space among sectors such as fishing, aquaculture, recreation and tourism, there is a need for a more integrated approach for the sustainable management of coastal resources. Integrated coastal management is the key to addressing the complex and often interconnected issues that directly or indirectly impact coastal areas. As a management tool, coastal management provides the essential processes for integration of all sectoral, spatial, temporal, policy and institutional components necessary to achieve the goal of sustainable development.

In the backdrop of climate change-related natural disasters plaguing the world the

coastal marine ecosystems, as well as, the urban landscape. With environmental management being on top of the province of Davao del Norte's development agenda, implementation of the Integrated Coastal management framework will be the realization of the following development goals:

- Empowering communities through adequate, extensive and well-coordinated information, education and communication campaign between and across LGUs.
- Installing accountable systems in offices with regulatory functions to ensure strict implementation of environmental laws and policies.
- Implementing inter-LGU cooperation, equity-sharing and joint monitoring

1.2 Methodology

The formulation of the plan commenced with the issuance of an Executive order creating the Technical Working Group for Integrated Coastal Management Planning (ICM-TWG). The ICM-TWG is a multi-sectoral team of technical personnel with varying backgrounds and specializations. Together with the core TWG from the provincial government were their partners in the city/municipal level which acted as resource persons. The members and of the ICM-TWG and the LGU partners underwent a series of capacity-building seminars and workshops to equip themselves with the skills of handling several activities useful in the collection, verification, and final analysis of pertinent data and other skills for the full development of the ICM.



Organizational meeting of the Provincial ICM-TWG



Hands-on Training on GIS Validation of mangrove areas on the coasts of Carmen. Davao del Norte

Basic data were gathered from relevant national agencies and confirmed through a series of assessment and validation activities. In the development of the Provincial ICMP, the support from the local government was sought. A multi-stakeholder consultation workshop was conducted to gather information necessary for the completion of the plan and to ensure participatory and transparent planning.



Coral assessment with CENRO-Island Garden City of Samal



As soon as the document is prepared, it was submitted to the Environment Development Committee (EnDC) of the Provincial Development Council for review. The EnDC then forwarded this to the Provincial Development Council (PDC) and then finally to the Sangguniang Panlalawigan (SP) for adoption.



Participants to the Multistakeholder consultation workshop for the Provincial ICM Plan

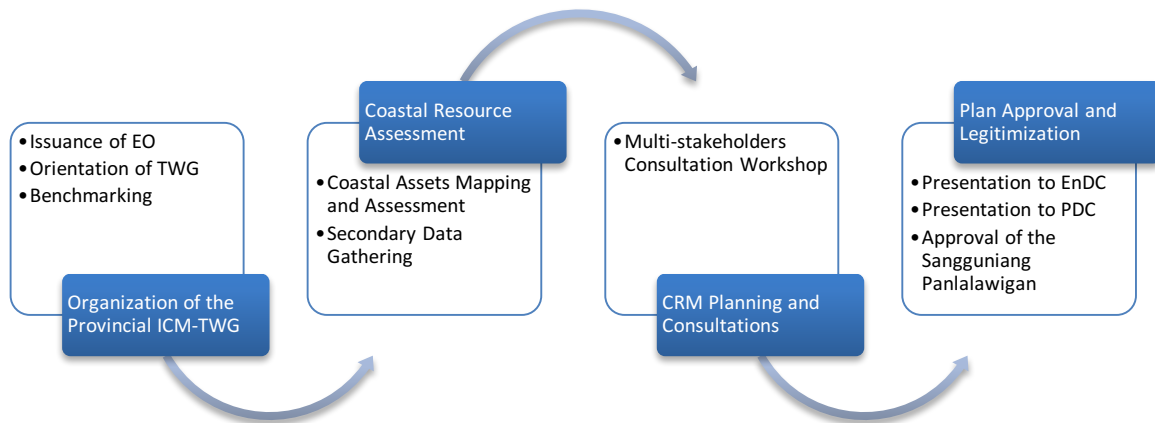


Figure 1. The ICM Planning Process.

1.3 Scope and Duration of the Plan

The Provincial Integrated Coastal Management Framework Plan is primarily focused on the management of the province’s coastal zone and its resources. Specifically, the plan:

1. **Covers a planning period of five-years.** The Plan will be reviewed every two-years to ensure responsiveness of the programs and projects identified.

primary planning unit, the plan covers all ecosystem assets within the horizontal and vertical influence of the watershed landscape within the province's political boundary.

3. **Used secondary data from national and local agencies released not more than 5-6 years.** Except for analysis of trends along a longer period of time, all secondary data used in this plan are the most recent and updated as a guarantee that the basis for analysis is relevant and still applicable. These secondary data were validated through stakeholder consultation activities. Meanwhile, the maps were generated by GIS specialists in the province using the Manifold System.

4. **Is not a consolidation of the ICM Plans of its coastal cities and municipalities.** It is a framework plan that sets the direction for coastal zone management in the province. It aims to ensure that all ICM plans are complementary without necessarily encroaching on the jurisdiction of its component LGUs coastal waters.



II. Davao del Norte Coastal Environment Profile

2.1 Biophysical Profile

Davao del Norte is located at the southeastern part of Region XI. It is bounded by Agusan del Sur on the North, Bukidnon on the Northeast, Davao City on the West, Davao Gulf on the South and the Province of Compostela Valley on the East.

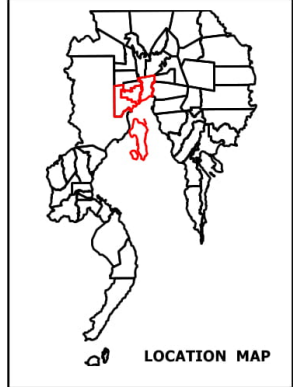
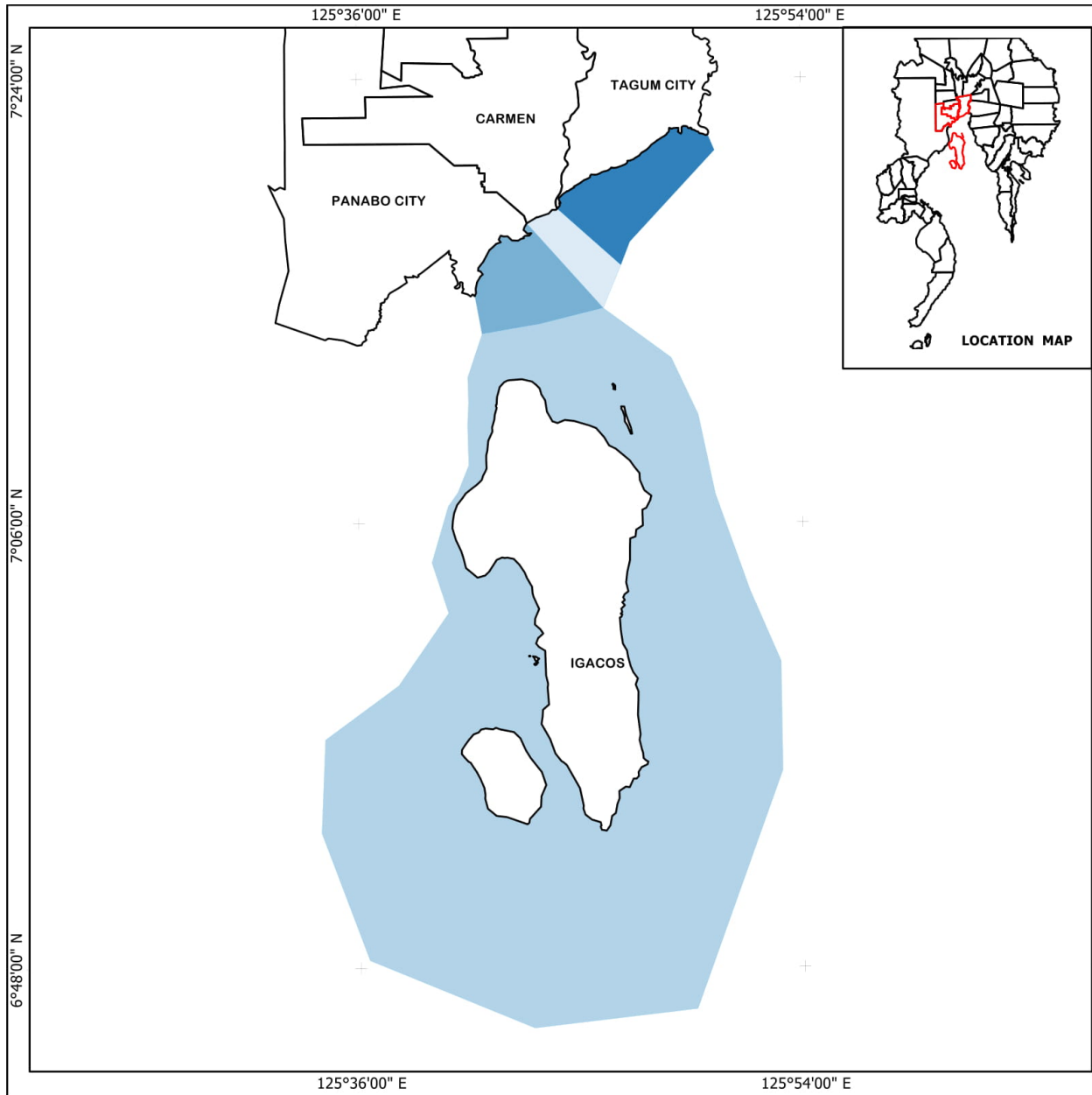
The province has a total land area of 350,851.61 hectares that comprise 14.65% of the total land area of Region XI. It has 11 component cities/municipalities four of which have areas along the coastal zone. The province has 42 coastal barangays distributed in 3 coastal cities and one coastal municipality.

It has 42 coastal barangays with a municipal water area of 111, 023.30 and a coastal stretch of 145.43 kilometers. The coastal and marine waters of Davao del Norte are part of the Davao Gulf.

Table 1. Land Area, no. of coastal barangays, coastal length and area

City/Municipality	No. of coastal barangays	Area of municipal waters (sq. km)	Length of shoreline (km)
Panabo City	4	4,545.54	9.64
Tagum City	5	5,163.89	15.48
Island Garden City of Samal	31	99,242.30	117.70
Municipality of Carmen	2	2,071.48	2.6
Davao del Norte	42	111,023.20	145.43

Source: PENRO-GIS







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MUNICIPAL WATERS



Scale = 1 : 400,000
Projection : UTM Zone 51 N
Datum : WGS - 84

LEGEND:

- Municipal Waters**
-  Carmen
 -  IGACOS
 -  Panabo City
 -  Tagum City

Prepared by:

ALLEN L. BATALUNA
SEMS

Check and Verified by:

REIL G. DELOSA
SEMS

Approved by:

ROMULO D. TAGALO
PENRO

Data Source:
Municipal Waters from DDN LGU's
Municipal Boundaries from DENR Reg. XI

Land Classification

Davao del Norte has a total land area of 360,851 hectares, of which 183,523.11 hectares or 51 percent are classified as Alienable and Disposable (A&D) and 177,328.50 hectares or 49 percent as forestland. Land classification is based on the criteria set by law. Areas categorized as production forest in the province is about 132,155.93 hectares, while the areas categorized under protection forest is approximately 27,722.84 hectares.

Topography

Davao del Norte is generally characterized by rugged, mountainous and moderately to steeply sloping areas on the western part and a wide alluvial plain on the central lowland area. Comprising the major portion of the alluvial plain is a flat tract of land. However, some places are gently undulating and exhibit a rolling topography. Davao del Norte has a generally low land terrain comprising 37 percent of the total land area with less than 100 meters elevation. The highest elevation ranging from 1000-2000 meters comprising 3 percent of the total land area is found in the municipalities of Kapalong and Talaingod.

Hydrology

The coastal zone extends beyond the marine waters. The interconnectedness of the terrestrial and aquatic ecosystems provides an inseparable relationship between land use and water quality. This poses major issues in the coastal zone.

The Davao del Norte coastal area is receiving drainage from immediate watersheds through tributaries and major river systems. There are two (2) major watersheds in Davao del Norte. These are the Saug-Libuganon watershed covering 247,500 hectares and the Tuganay watershed with 69,375 hectares. Fifteen (15) rivers and creeks traverse the province. The bigger rivers such as the Lasang, Tagum/Libuganon, Saug and Tuganay drain the broad plain west and north into Davao Gulf.

Tagum/Libuganon River with a total length of 95 kilometers is the longest among the major rivers in the province and has a total watershed area of 247,500 hectares. It originates from the eastern hillside of the Mindanao Central Cordillera and flows to the central alluvial plain, and then extends to Davao Gulf.

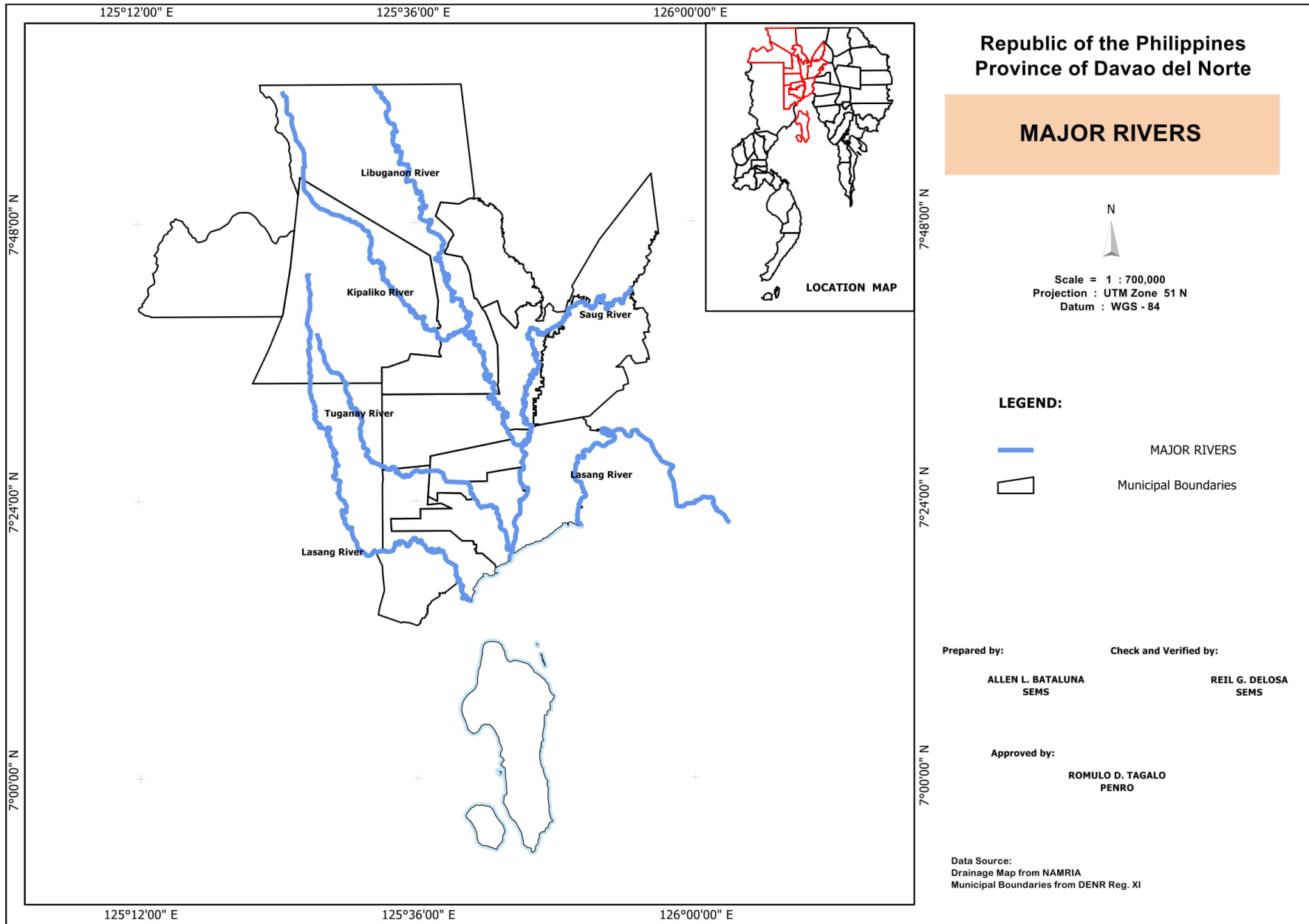
Tuganay River is a waterway which originates from the mountain range at the boundary

Hijo River is a combination of the two upper branching medium-sized rivers: the Tagum River which is located along the Lingdan Mountain Range and the Masara River located along the Amacan Mountain Range. It is also partly bounded by two mountain ranges and flows toward the north-west direction going to the municipality of Mawab, meanders westward along the National Road and finally empties into Davao Gulf at the southern periphery of Brgy. Hijo, Apokon, Tagum City.

The state of these two major river systems consequently affects the state of the coasts of Davao del Norte.

Table 2. Length of Major Rivers, Davao del Norte

RIVER	LENGTH (KM)
Hijo River	59.40
Kipaliko River	68.83
Lasang River	90.78
Libuganon River	119.31
Saug River	66.22
Tuganay River ¹	63.18
Grand Total	467.73



125°12'00" E 125°36'00" E 126°00'00" E

7°48'00" N

7°48'00" N

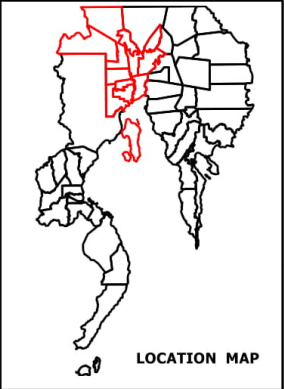
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7°24'00" N

7°00'00" N

7°00'00" N

125°12'00" E 125°36'00" E 126°00'00" E



Scale = 1 : 700,000
 Projection : UTM Zone 51 N
 Datum : WGS - 84

LEGEND:

- MAJOR RIVERS
- Municipal Boundaries

Prepared by: ALLEN L. BATALUNA
 SEMS

Check and Verified by: REIL G. DELOSA
 SEMS

Approved by: ROMULO D. TAGALO
 PENRO

Data Source:
 Drainage Map from NAMRIA
 Municipal Boundaries from DENR Reg. XI

Water Supply

The province has abundant water supply both from surface and groundwater resources. A study conducted by the Sinclair Knight Merz in 2004 for an Integrated Water Resource Development Project for the Province of Davao del Norte identified surface water from Tagum River as a major resource which can provide a large volume for potable drinking water with minimal risk of supply failure. The water in the river will require treatment though considering its quality. Likewise water supply needs for agricultural purposes, in terms of volume, accessibility and availability will also have to be given due consideration.

Groundwater availability on the other hand is classified as deepwell and difficult area. Deep well area covers approximately 80% of the province, widely distributed in the river basins of Tagum and Davao rivers. Groundwater is the main source of drinking water in the urban centers of Tagum, Panabo, Sto. Tomas, Island Garden City of Samal, New Corella and Carmen. About 20% of the provincial area is classified as a difficult area to exploit groundwater. Such areas are characterized by mountains in the northwestern side of the province. Springs are the common source of water in these areas. There are 157 developed springs currently serving the populace mostly in the rural areas of the province.

Water Quality

Large amounts of pollutants make their way into the coastal waters through the major rivers draining into the seas. It is essential to examine the water quality in these rivers as most sources of contamination that eventually lead to marine pollution are land-based as in domestic and industrial wastes, agro-chemical loading, siltation/sedimentation and toxic and hazardous wastes, and oil pollution.

Tuganay River is classified as Class B water. Sand and gravel are abundant at its upper reaches while its lower reaches are characterized predominantly with muddy soil due to presence of silt materials. A big sand bar is present at the mouth of the river forming an island which is reforested with mangrove. The upper reaches of the river is generally used for bathing, domestic uses and drinking water for domesticated animals. Hijo River on the other hand is classified as Class C water. It traverses through mining, agricultural and residential areas.

Based on water quality assessments for these two major rivers conducted by the Environment Management Bureau over the last five years, the water quality of both

however major parameters that exceeded limits. These are for cyanide, mercury and total coliform.

For Tuganay River, total coliform levels have exceeded standards for all water monitoring stations. This extends all the way to the mouth of the river as shown in Figure 2. Total coliform levels indicate the presence of fecal contaminants that cause water-borne diseases. Sources of Coliform bacteria are from domestic and industrial wastewater discharges, septic tanks, animals and wildlife. Fecal coliform comes from human and animal wastes.

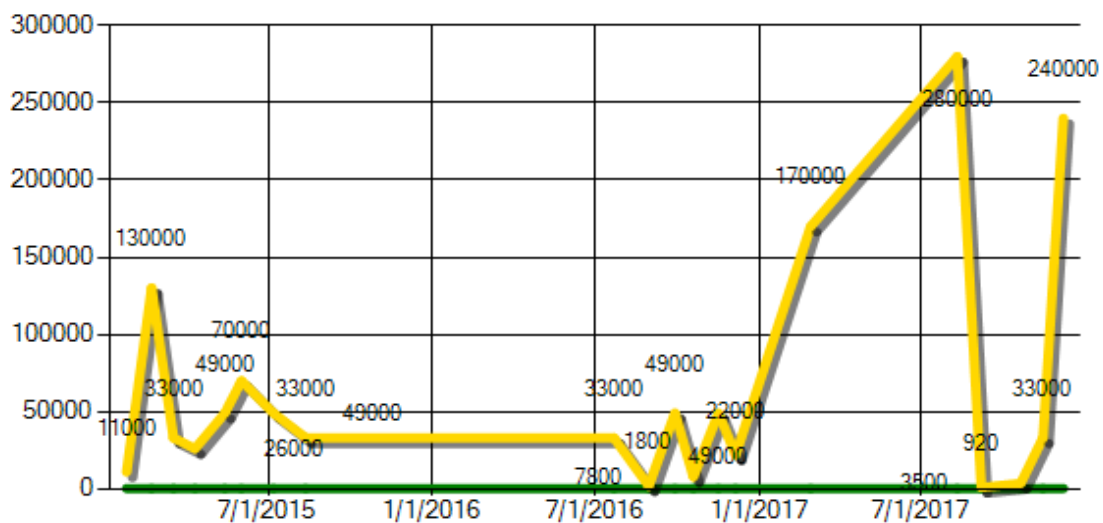


Figure 2. Fecal coliform levels in Tuganay River,
Source: Environment Management Bureau

On the other hand, increase in Mercury and Cyanide levels have been observed in Hijo River in each monitoring stations across a three-year monitoring period. Mercury exceeded limits in 2013 and 2014 while cyanide exceeded limits in all stations since 2015. This alteration in the water quality of the river could be attributed to the mining activities in the upstream and tributaries of the river, domestic wastes and agricultural run-off. There are mining firms gold panning activities in the river.

Sanitation

There are no sewerage facilities with treatment plant in the province. Domestic wastewater is disposed through septic tanks, storm drainage, canals and other disposal system without treatment. Excreta are commonly disposed by households through septic tanks and closed pits. As of 2015, 91.23% of the total households are using sanitary

Table 3. Toilet Facilities, Davao del Norte, CY 2015

Municipalities/ Cities	No. of HH	Status of Toilet Facilities per HH**					
		HH** using Sanitary Toilets	%	HH** using Unsanitary Toilets	%	No. of HH** w/o toilet	%
Asuncion	14,439	12,918	89	704	5	817	6
Carmen	5,333	5,003	94	205	4	125	1
B.E. Dujali	18,355	17,499	95	16	0	840	5
IGaCos	25,350	21,682	86	490	2	3,178	13
Kapalong	12,331	11,001	89	701	6	629	5
New Corella	13,503	13,001	96	464	3	38	0
Panabo City	42,884	40,627	95	920	2	1,337	3
San Isidro	6,495	5,303	82	1,114	17	78	1
Sto. Tomas	25,802	24,718	96	810	3	274	1
Tagum City	56,044	54,929	98	11	0	1,104	2
Talaingod	4,882	2,762	57	594	12	1,526	31
Davao del Norte	250,76 8	231,125	92	6,519	3	13,124	5

Source: *Provincial Health Office (PHO)*

(Note: HH** - Actual household survey conducted by PHO Field workers)

Climate and projections

The province has Type IV climate under the coronas classification and is characterized by unpronounced dry and wet seasons. Rainfall is more or less evenly distributed throughout the year with no pronounced rainy season and dry season. Davao del Norte

The fairly pronounced rainy months in the province are from November through February. The province's average annual rainfall for the past five years, which was based on climatological data from PAG-ASA Agromet Station in Tagum City, ranges from 173.70 mm. to 251.96 mm.

The whole province is going to experience relatively warmer conditions in March-April-May 2020 as compared to the observed seasonal temperatures. There will be 2.5 °C warming during the months of June-July-August of 2050 as compared to the observed seasonal temperature. There is minimal decrease in the months of September, October and November both in 2020 and 2050 as compared to observed seasonal temperature.

This projected increase in temperature has dire consequences for coastal and marine resources and subsequently food security.

Table 4. Projected Seasonal Temperature

PERIOD	SEASON			
	December- January- February	March- April-May	June- July- August	September- October- November
OBSERVED 1971-2000	26.7	27.6	27.4	27.4
2020 projected seasonal temp	27.6	28.7	28.6	28.5
2050 projected seasonal temp	28.6	29.9	29.9	29.5

Provincial projections shows that there will be a reduction in rainfall during the summer and habagat seasons in 2020 this will continue on till 2050 in the same season. On the contrary, the months of June, July and August will be wetter in the futures as rainfall increases.

Table 5. Projected Seasonal Rainfall

CLIMATE VARIABLE	SEASON			
	December -January- February	March- April-May	June-July- August	September- October- November
OBSERVED 1971-2000	637 mm	496.5 mm	535.6 mm	556.2 mm
2020 projected seasonal rainfall	695.604 mm	434.4375 mm	516.3184 mm	547.857 mm
2050 projected seasonal rainfall	707 mm	386.277 mm	493.2876 mm	543.9636 mm

Changes in future climate will affect result in abiotic changes which will impact on the fishery resources and habitats in general. Table 6 shows the the projected impacts of climate change on Philippine fisheries in a study by Santos et al (2011).

Table 6. Impacts of Climate Change on Philippine Fisheries.

Abiotic changes due to climate change	Effects on fishery resources and habitats
<p>Sea surface temperatures (SST) Observed: ~ 0.11°C/decade (1950-2007) Projected: ~ 1.00-3.00°C by end of century</p>	<p>Coral bleaching, branching corals vulnerable • Fishes move to cooler areas, since tolerance limits narrow, risks of extinction increased: tuna, skipjack moving to cooler central Pacific Ocean, reducing fish supplies for people elsewhere in Coral Triangle region including the Philippines</p>
<p>Ocean acidification Observed: ~ 0.1 units Projected: ~ 0.3-0.4 units by 2010 Aragonite saturation state and coral calcifications marginal in 2020-2050</p>	<p>With doubling atmospheric carbon dioxide, reduction of calcification in corals and species with carbonate skeletons, corals become more fragile, recovery becomes slower; both increasing SSTs and acidification increase stress to corals</p>

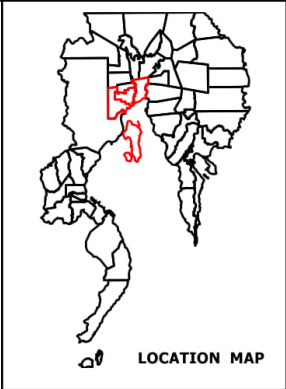
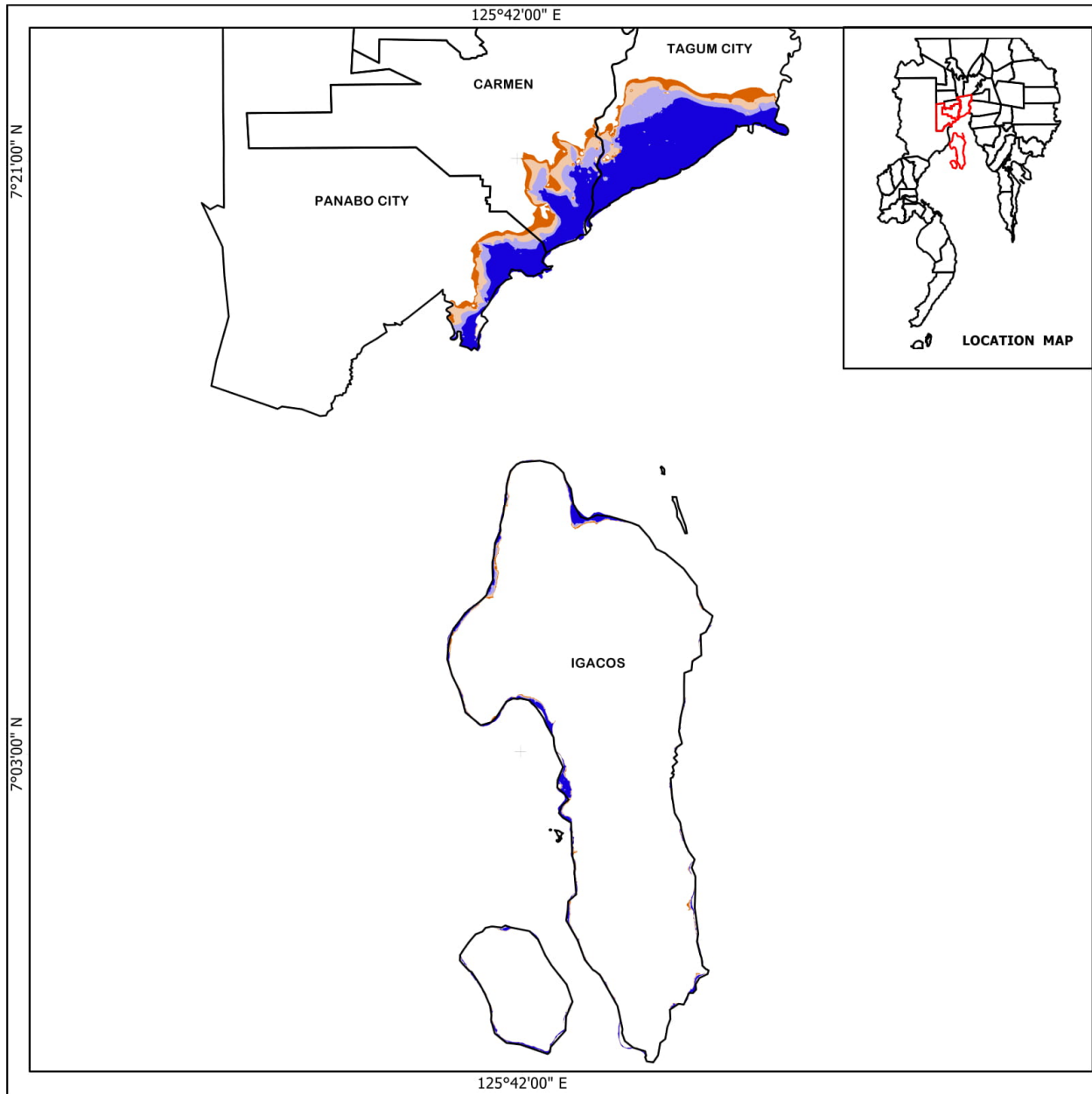
Abiotic changes due to climate change	Effects on fishery resources and habitats
<p>Sea level rise Observed: ~ 10-20 cm over 20th century (especially true for Philippines) Projected: a further rise of 30-60 cm by 2010, with ice melting 4-6 m by 2100</p>	<p>Flooding of low islands and low lying areas resulting in land erosion, sea water intrusion in coastal land areas, population displacement, landward growth movement of mangroves, changes in phenology of mangroves</p>
<p>Tropical cyclones Observed: Doubling in frequency of super typhoons</p> <p>Projected: Become more intense with heavier rainfall</p>	<p>Increasing frequency and strength weaken skeletal framework of corals, accelerate erosion of beaches, weaken coral resistance to disease, prevent normal recruitment of marine species including fish species used as food</p>
<p>El Niño Southern Oscillations</p> <p>Observed: Has occurred in recent past</p> <p>Projected: Will be significant source of climate variability</p>	<p>Worsen the effects of other climate change stresses</p>
<p>Storm surges, strong monsoon winds</p> <p>Observed: Increasing frequency and severity</p> <p>Projected: Will increase in severity</p>	<p>Coastal erosion in small islands, destruction of infrastructures and buildings</p>
<p>Ocean circulation Observed: Little information at present</p> <p>Projected: Some upwelling could cease and horizontal currents could change directions, altering oceanographic regimes, resulting in changes in ocean productivity</p>	<p>Prevents normal dispersal and distribution of larvae of marine species, mangrove and coral propagules, resulting in low fish and fishery productivity, degradation of coral reef systems, decline of coastal and reef fishes, and failure of fish recruitment</p>

Storm surge-prone areas

One of the major hazards of climate change are more severe storm surges. Table 7 shows areas exposed to storm surges at varying heights. Settlements and critical infrastructure along these areas should be climate-adaptive and resilient for it to stand severe weather disturbances. Coastal zoning should take into consideration these information to avoid placing critical infrastructure along these areas.

Table 7. Land area exposed to Storm-surge

Municipality/City	Storm-surge height				Grand Total
	2 meters	3 meters	4 meters	5 meters	
Carmen	11.86	22.10	30.84	53.37	118.16
IGACOS	100.05	153.12	188.54	218.73	660.44
Panabo City	175.51	291.73	402.78	522.22	1,392.25
Tagum City	54.90	75.40	92.22	119.44	341.95
Grand Total	342.32	542.34	714.38	913.76	2,512.80



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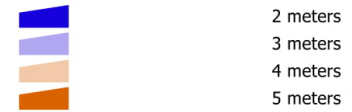
**STORM SURGE PRONE
AREAS**



Scale = 1 : 300,000
Projection : UTM Zone 51 N
Datum : WGS - 84

LEGEND:

**Storm Surge Davao del Norte
Storm Surge Height**



Prepared by:

ALLEN L. BATALUNA
SEMS

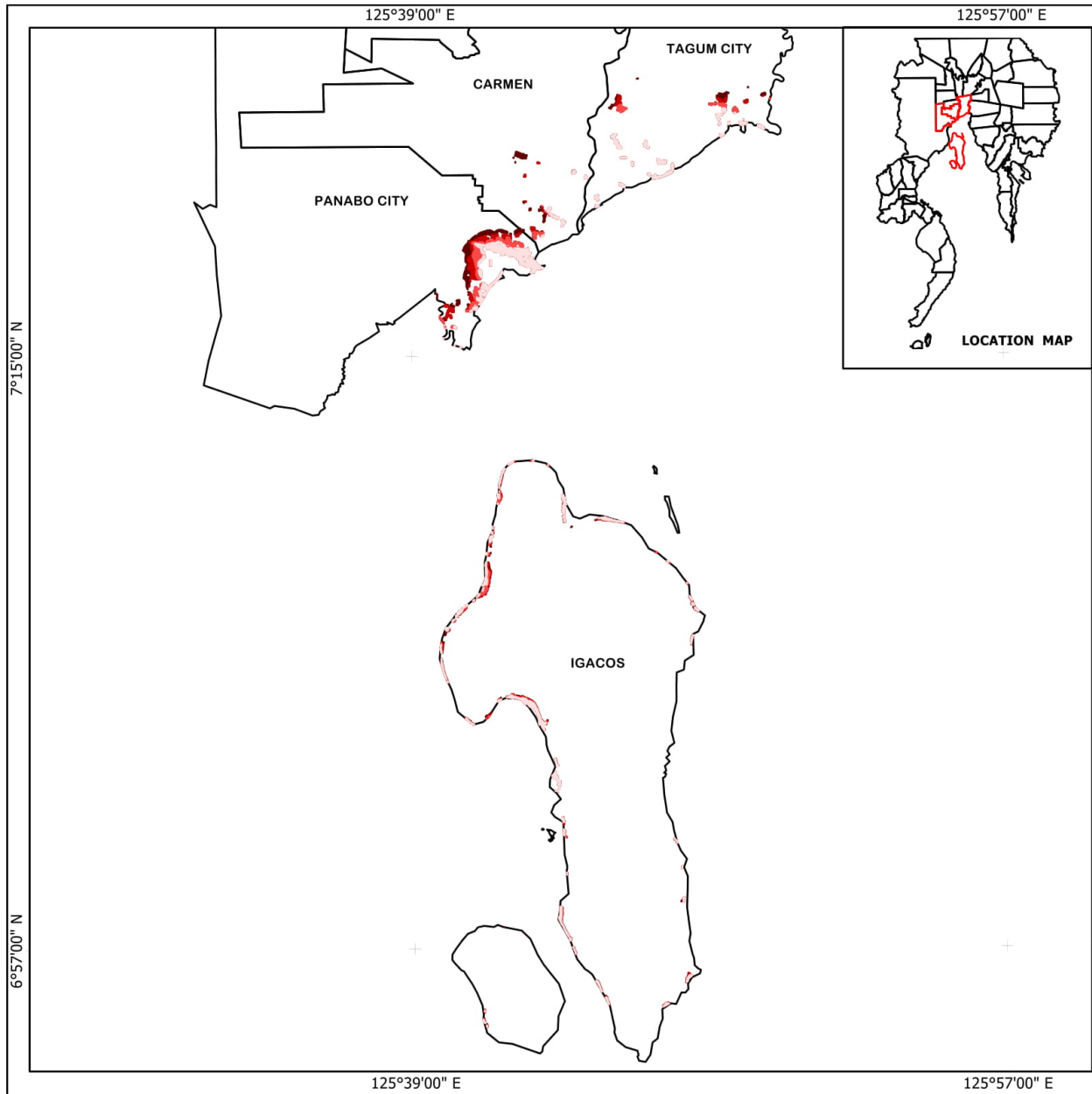
Check and Verified by:

REIL G. DELOSA
SEMS

Approved by:

ROMULO D. TAGALO
PENRO

Data Source:
Storm Surge Map from NAMRIA
Municipal Boundaries from DENR Reg. XI



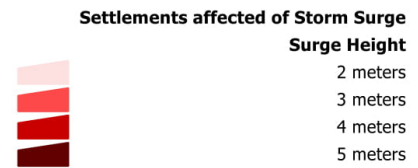
Republic of the Philippines
Province of Davao del Norte

**SETTLEMENTS PRONE TO
STORM SURGE**



Scale = 1 : 300,000
Projection : UTM Zone 51 N
Datum : WGS - 84

LEGEND:



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PENRO

Data Source:
Storm Surge Map from NAMRIA
Land cover 2015 from NAMRIA
Municipal Boundaries from DENR Reg. XI

2.2 Population and current resource use

Davao del Norte population is recorded as the highest in Region XI at 1,016,318 in 2015. The average household size is 4.90 persons per household. The Island Garden City of Samal has the highest number of residents in coastal barangays as it has the most number of coastal barangays as well.

Table 8. Population in coastal cities/municipalities

Municipality/City	Total population	Population in the coastal Barangay	% Population in the coastal Barangay
Tagum City	259,444	15,847	6.10
IGACOS	104,123	73,644	70.7
Panabo	184,599	38,979	21.13
Carmen	74,679	5,221	6.99
TOTAL	1.02 M	133,691	13%

Source: PSA 2015

Fisheries and Aquaculture

Fishing is one of the most practiced activity along the coastal areas of Davao del Norte. There are two forms of fishing in the area, brackish water aquaculture and capture fisheries. For capture fisheries, production is limited to municipal fishing as there are no registered commercial fishers in the coasts of Davao del Norte.

Table 9. Fisheries production of Davao del Norte 2014-2016

	2014	2015	2016
Fisheries (metric tons)	4974.42	5,208.35	5,517.21
Value of production ('000)	448,262.56	486,729.53	496,698.18
Municipal fisheries	1,175.24	1,013.10	1,706.98
Value of production	111,471.32	97,046.41	148,780.28
Marine municipal fisheries	1,170.51	1,009.52	1,704.50
Inland municipal fisheries	4.73	3.58	2.48
Aquaculture	3,799.18	4,195.25	3,810.23
Brackish water fish cage	38.74	32.18	6.42

Freshwater fish cage	.64	.37	
Freshwater fish pen	.05	.75	.35
Marine fish cage	2,971.19	3,266.20	2,788.47

Source: Bureau of Fisheries and Aquatic Resources, 2017

2.3 Coastal resources governance

The basic framework for coastal management can be found in already existing national laws and regulations. The 1987 Constitution provides for the right to a balanced and healthy ecology and specifically mandates the Philippine government to conserve the nation's marine wealth. Statutes and regulations concerning coastal management have existed for decades.

The 1991 Local Government Code provided local government units (LGUs) with broad governmental powers to manage fisheries and aquatic resources within municipal waters. Municipalities and cities serve as the primary unit of governance for coastal management in the Philippines. Through the devolution of powers, LGUs possess broad governmental powers, especially in the delivery of basic services—including the duty to protect and manage the coastal and marine environments, to impose local fishery revenues and taxes, to delineate their municipal waters, and to allocate the use of resources within municipal waters.

The capacity of the municipal and city government units in managing coastal resources in three areas were assessed and is summarized in Figure 3. Operation and Implementation refers to how the Coastal LGUs manages programs and projects related to coastal management, Decision-making process refers to how the LGUs make decisions and formulate policies and information flow refers to how information is exchanged between and among stakeholders.

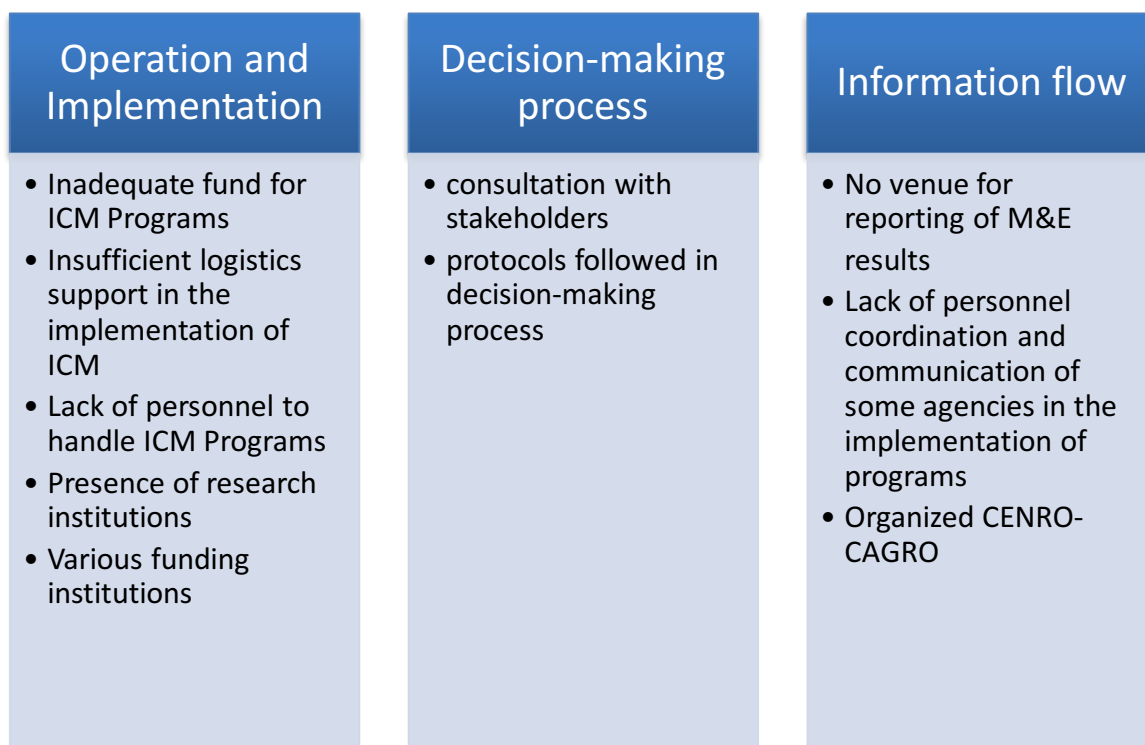


Figure 3. Institutional Profile for provincial coastal management

2.3 State of Natural Resources

Coastal Resources

The province has a total mangrove area of 461.01 hectares. Among the coastal areas of the province, Panabo City has the largest area planted with mangrove with 109.87 hectares. Table No. 10 indicates the areas of mangrove, seagrass and coral reefs in the province.

Table 10. Extent of Coastal habitat, Davao del Norte CY 2017

LGU	Coral reef area (ha)	Mangrove area (ha)	Seagrass beds (ha)
Carmen		96.48	2.62
Island Garden City of Samal	909.81	69.65	1,091.04
Panabo City	4.91	109.87	123.72
Tagum City	2.38	185.02	188.92

Mangroves

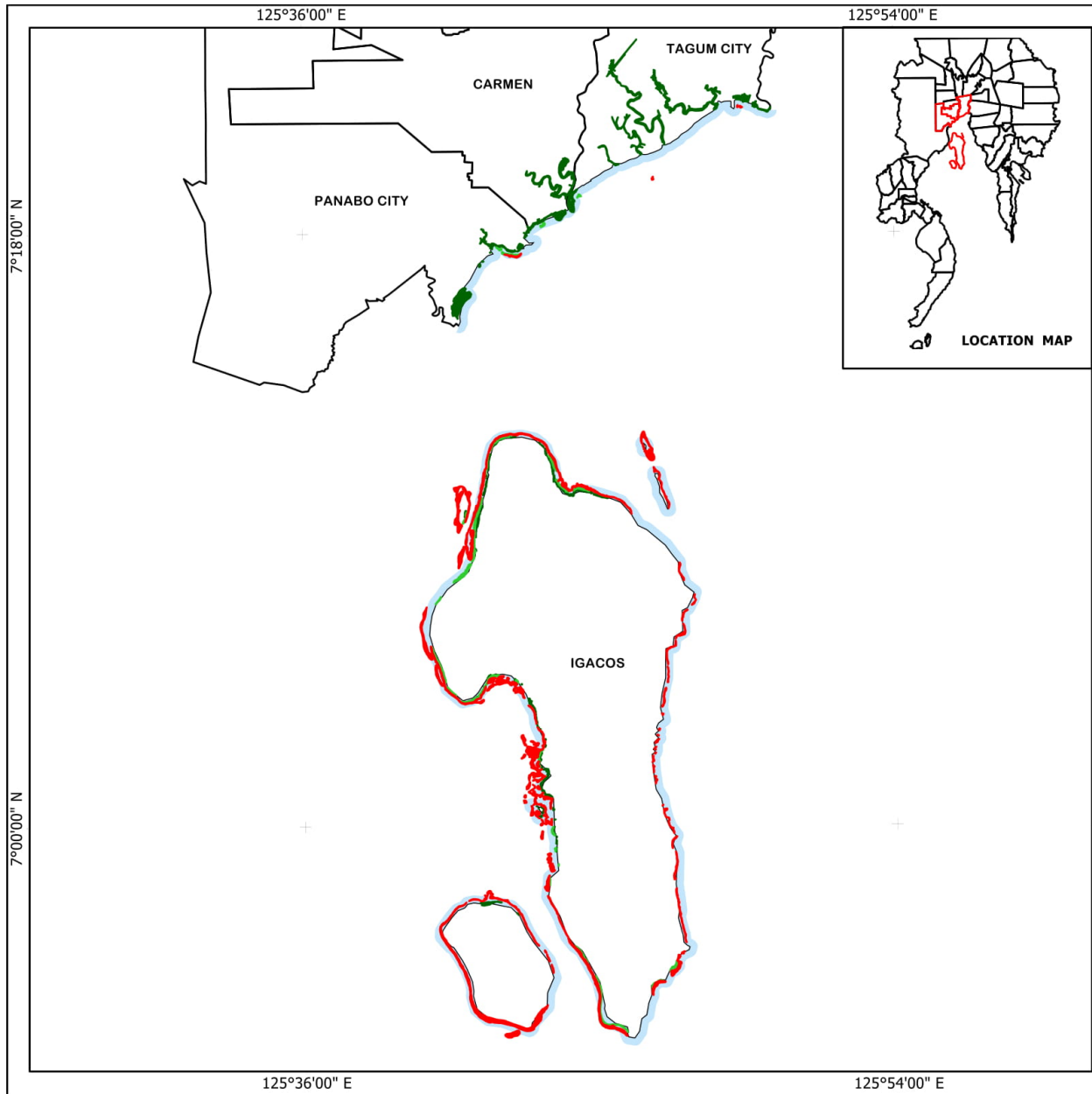
Mangroves are found on the southern coastlines of Panabo, Carmen and Tagum down to the Island Garden City of Samal on the northern and western coastline. The dominant groups are *Sonneratia* species (Pagatpat), *Rhizophora* (Bakauan) and *Avicennia* (Bungalon).

Seagrass beds

Seagrass beds are confined to relatively small patches of shallow intertidal and sub-tidal areas. Survey of seagrass beds was limited to visual identification and estimates of areal extent. Seagrass areas are subject to periodic, and sometimes heavy, sedimentation from Tuganay and Lasang River. The most common seagrass species are *Enhalus acoroides*, *Syringodium isoetifolium*, *Cymodocea rotundata*, *Halodule pinnifolia*, *Enhalus acoroides*, *Cymodocea rotundata*

Coral reef

The coral reef area in Davao del Norte is highly concentrated in the Island Garden City of Samal. From various studies conducted in Island Garden City of Samal, Dominant species include genus *Porites* has a high coral cover in shallow waters while genus *Sarcophyton*, a soft coral dominated in deep stations *Acropora*, *Porites*, *Diploastrea*, *Goniopora*, *Montepora*, and *Favites*, *Portidea*.



Republic of the Philippines
Province of Davao del Norte




COASTAL HABITAT



Scale = 1 : 300,000
Projection : UTM Zone 51 N
Datum : WGS - 84

LEGEND:

COASTAL HABITAT

-  Coral
-  Mangrove
-  Seaweeds/Seagrass

Prepared by:

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Check and Verified by:

REIL G. DELOSA
SEMS

Approved by:

ROMULO D. TAGALO
PENRO

Data Source:
Coastal Habitat Map from NAMRIA & LGU's
Municipal Boundaries from DENR Reg. XI

Mineral Resources

Davao del Norte have rich deposits of non-metallic minerals like guano, marble, limestone and others. It has an estimated total reserve of 44,845,283 MT of non-metallic minerals. The Province also has an abundant source of high grade quality sand and gravel. Tagum City, Panabo City and the municipalities of Carmen, Kapalong and Sto. Tomas are the major suppliers of sand and gravel.

Upland/Forest resources

Forest lands are those lands of the public domain which have been classified as such and declared as needed for forestry purposes. Forest lands are also watershed which inherently produce more benefits and give better service than when converted to agricultural lands or other uses, such that, those lands are not to be titled. Forestlands in the province include production and protection areas. Not all forestlands are covered with forest trees. Areas categorized as production forest in the province is about 74,944.70 hectares, while the areas categorized under protection forest is approximately 60,773.52 hectares.



III. Key Management Issues

3.1 Common environmental issues

The sustainable management of the coastal assets of the province lies in the resolution of four (4) major environmental problems plaguing its coasts. These were common and recurring issues identified during the consultation workshops conducted with the different stakeholders and users.

Declining water quality

Denudation of upland and coastal forests increases erosion and sedimentation thus, increasing siltation in the coastal waters. Most of the siltation and sedimentation in rivers contribute to the narrowing and shallowing of waterways and fishing grounds.

Pollution in rivers is also a cause for concern. As early as 1996, monitoring of the country's rivers showed that only 51% of the classified rivers still met the standards for their most beneficial use. The rest are already polluted from domestic, industrial and agricultural sources. In Davao del Norte, Cyanide and Fecal Coliform is beyond normal limits for Hijo River and Tuganay River respectively. Studies point to the fact that domestic wastewater is the principal cause of organic pollution of surface water bodies. This

industries such as piggeries. Only 3% of investments in water supply and sanitation were going to sanitation, sewage and treatment.



Sedimentation and siltation where Libuganon River meets Davao Gulf

Illegal and destructive fishing methods

The use of illegal and destructive fishing methods are still observed and reported in the coasts of Davao del Norte. Fisherfolks resort to unsustainable fishing practices and highly effective albeit destructive fishing methods such as cyanide, fine mesh nets, unregulated gathering of prohibited species to ensure substantial catch per unit effort. Illegal fishing practices are not limited to the coasts and seas, in the rivers upstream, the use of poison and use electrocution as a means of catching fish is also prevalent. This non-selective fishing practice puts at risks juvenile catches and further aggravates degradation of coral, seagrass and mangrove habitats.

Improper solid waste management

Solid waste management systems are not sufficient to meet the increasing volume of waste from the rapidly growing population hence, garbage is finding its way to rivers and the coastal waters. Shoreline debris is determined to be a problem specially off the coasts of IGACOS but it was not possible to establish the origin of much of the debris as a number of rivers traverses lowland communities and empty out to the Davao Gulf. Solid waste could be coming from many sources however, in the past a significant proportion of the debris has reportedly originated from banana plantations.



Dead whale shark washed ashore after ingesting plastic and other solid wastes.

Habitat degradation

The coastal and marine resources/habitats are in various states of degradation through various land and sea-based activities. There is evidence of extensive coral damage from infestation of crown of thorns. Heavy sediment loading caused by erosion and siltation from denuded watersheds also posed significant negative impacts on seagrasses and reefs. Moreover, mangrove areas exist in intermittent strip along the coasts, mostly as low lying secondary growth trees. There is evidence of denudation.

Habitat degradation or loss of precious habitats will lead to low or even loss of fish catch and other resources, and loss of functional integrity of ecosystems. Mitigating measures should be employed to reduce the effects of these problems in the coastal areas of the province.

3.2 Other cross-cutting issues

Proliferation of informal settlers

Most of the municipalities in the province along Davao Gulf are experiencing the pressure of increasing settlement in their respective coastal areas. The threat on other resources, such as mangroves continues to hang due to continuous reclamation and encroachment of people for their settlement and other purposes. Proliferation of

Multiple-use conflicts

Multiple resource-use conflicts also continue to proliferate resulting in over-utilization and depletion of coastal and marine resources. These conflicts hinder the optimum utilization of the coastal area. Some of the major conflicts are reclamation vs. mangrove and mudflat protection, tourism versus reef protection, shipping vs. fishing and aquaculture; tourism vs. informal settling and others.

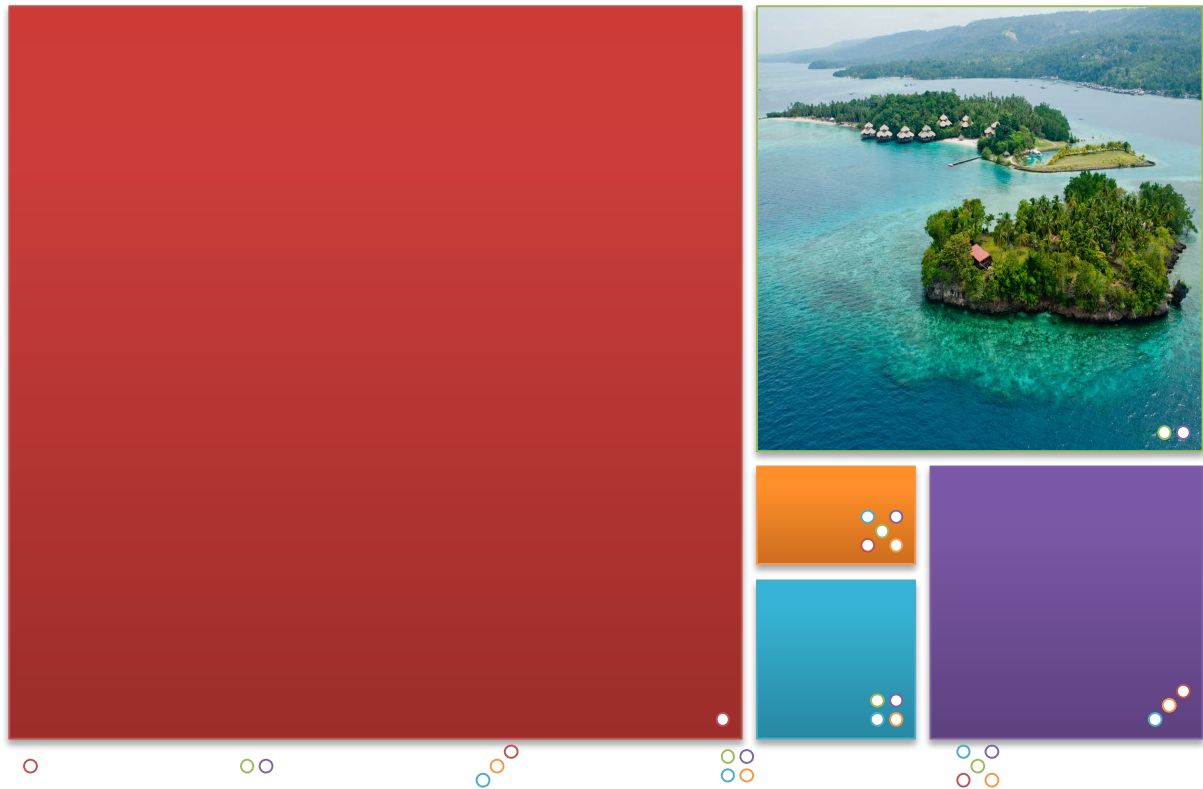
Climate Change and Disaster Risk

Climate-related hazards pose real threats not only to the already degraded habitats but also the communities and critical infrastructure along the coasts and seas. Increase in sea-surface temperature will bring about more coral bleaching episodes. Stronger typhoons and increase in sea-level will consequently result to higher storm surges. A combination of mitigation and adaptation measures should be employed to address this.

Weak Governance and Management

At the municipal level, institutional arrangements for ICM are still considered weak. Local coastal managers report inadequate fund for ICM programs, lack of personnel to handle ICM Programs, insufficient logistics support in the implementation of ICM , weak law enforcement of environmental laws and other local policies (P.D. 705) as hindrance to proper coastal management. The lack of coordination and communication among agencies in the implementation of Programs in the municipality is also considered as a challenge in management.

At the provincial level, the lack of a database for coastal information has slowed effective planning and decision-making. In the absence of baseline information, the impacts of both management and development projects could not be adequately measured. For the longest time, coastal and marine management have also focused on fisheries production. And although conservation activities has started through PENRO, these are limited to the mangrove ecosystem. There is a need to take a holistic and integrated approach in coastal and marine conservation that involves the mangrove, seagrass and coral ecosystems. Along with this, competencies in coastal management has to be improved.



IV. ICM Direction, Key Result Areas and Development Strategies

The Provincial ICMFP provides a comprehensive framework, which helps determine directions in achieving targeted outcomes and formulating a series of specific actions and programs involving the participation of government and non-government sectors in coastal management.

4.1 Vision, Mission, Goal and Strategic Objectives

Vision

A premier province in producing export quality aqua-agricultural products that are globally competitive with climate change adaptive and risk-resilient communities, social equity, improved quality of life under a transparent and responsive governance

Mission

It is the mission of the Provincial Integrated Coastal Management Program to develop and implement approaches for local authority planners, regulators and stakeholders on future use development and management of Davao del Norte's coasts integrating the social, environmental and economic interests of the Dabawnons.

Goals

To protect coastal habitats, natural systems and ecological processes from land and sea-based threats

To enhance productivity of the coastal zone and ensure long-term sustainable use of marine resources

To improve the quality of life of coastal communities

To improve collaborative management and minimize conflicts of interest among local government units, coastal communities and other stakeholders

To strengthen the institutional capacity of the province on holistic and ecosystems-based management of the Davao del Norte coastal zone

1.2 Key Result Areas, Objectives and Strategies

Coastal Land Use and Zoning

Objective: To identify appropriate resource use for the Davao del Norte coastal area through coastal area zoning and to develop strategies for the management of each zone through participative and multisectoral planning and plan implementation.

Strategies:

1. Capacity building in Climate Change-Adaptive and Disaster Risk Sensitive Coastal Land Use and Zoning
2. Delineation of the different coastal area zones for the Davao del Norte coast according to the following zoning guide, viz;

Strict Protection Zone – areas with high biodiversity value which shall be closed to all human activities except for scientific studies and/or ceremonial or religious use by indigenous communities.

Restoration Zone – areas of degrade habitat where the long-term goal will be to

as well as monitoring and maintenance of fish sanctuaries and seagrass transplanting, Existing houses and, agricultural developments may be allowed to remain but would be phased-out eventually.

Multiple-use Zone – areas where settlement, traditional and/or sustainable land use, including agriculture, aquaculture, extraction activities and other income generating or livelihood activities, may be allowed to the extent prescribed in the management plan. Land tenure may be granted to tenured residents, whether they are members of indigenous cultural communities or migrants.

Buffer Zone - areas outside the protected area but adjoining it that are established by law and under the control of the DENR. These are effectively multiple-use zones that are to be managed to provide a social fence to prevent encroachment into protected areas by outsiders.

Recreational Zones – areas high in recreational tourism educational or environmental awareness values where sustainable eco-tourism recreation, conservation education or public awareness activities may be allowed as prescribed in its management plan.

Industrial Zone - areas where commercial and industrial establishments are allowed.

Sustainable Use Zone - natural areas where the habitat and its associated biodiversity shall be conserved and where consistent with the management plan:

- indigenous community members and/or toward migrant and or buffer zone residents may be allowed to collect and utilize natural resources using traditional sustainable methods that are not in conflict with biodiversity conservation requirements;
- research, including the reintroduction of indigenous species, may be undertaken, and
- visitors may be allowed limited use.

No clearing, farming, settlement, commercial utilization or activities detrimental to biodiversity conservation shall be undertaken.

2. Updating of the coastal resource profile of the delineated zones through the Geographic Information System (GIS).
3. Development of Appropriate Plan for each Management Zone.

Fisheries and Habitat Management

Objective: To improve coastal and marine habitat (mangrove, seagrass, coral reef) conditions to “good or fair”

Strategies:

For mangrove areas:

1. Establishment of fish sanctuaries and mangrove reserves shall be undertaken and the rehabilitation of degraded habitats, particularly the mangrove forests should form part of fishery management activities
2. Strengthening of identification of mangrove reforestation sites and collaboration with the local communities for reforestation projects.
3. Encourage production of seedling and propagule collection in coastal communities to ensure stable supply of planting materials.
4. Establishment of mangrove nurseries and seed banks to be managed by the community.

For Coral Reefs:

1. Selection of sites for establishment of fish sanctuaries and marine resources will be conducted using the PCRA data.
2. Zone delineation. After the selection of areas for fish sanctuaries and marine reserves it will be delineated and demarcated with local community support.
3. Continuous protection and law enforcement on these sanctuaries and reserves will be undertaken. This can be done by mobilization of organized FARMCs and strengthening of existing bantay-dagat. Furthermore, legal and institutional support will be lobbied for prosecution and logistical support.
4. Trainings on simple method of resource assessment will be conducted for coastal

5. Regular monitoring and documentation of PPAs.

For Seagrass beds

1. *Underwater Assessment.* A seagrass assessment will be undertaken in areas, which has no baseline information.
2. *Zone Delineation* and seagrass assessment where areas with high level of diversity and extension beds shall be protected and conserved.
3. *Protection.* In the same manner, the monitoring and evaluation of these areas shall be primarily undertaken by the coastal communities and shall submit its report to the PENRO for supervision.

For Critical Watershed Areas

1. *Identification of Critical Watershed Areas.* Using existing data from provincial profiles and other sources, watershed areas will be identified and zoned as to a protected area. Specific management plans will be formulated for each identified watershed areas.
2. *Rehabilitation and Protection of Critical watershed areas.* The Provincial Forest Land Use Plan provides the framework for watershed management at the provincial, municipal and community level. Proposed investments in the Provincial FLUP shall be supported.

Livelihood and enterprise management in the coastal zone

Objective: To improve income of coastal communities

Various alternative income generating activities, which are sustainable, and environment-friendly will be introduced as a component of this plan. It shall encourage broad participation of the coastal communities in the planning/designing and implementing livelihood projects. Specific activities can be undertaken for this strategy such as.

1. *Conduct Participatory Environmental Scanning and Project Identification.* This activity will be conducted with the active participation of coastal communities in the identification of appropriate livelihood for a specific area.
2. *Formulation and Adoption of Project Studies.* Alternative livelihood projects identified would be developed by the community with assistance from various

3. *Conduct Skills and Training Demonstrations and Technology Transfer.* Existing technologies relevant to enterprise development will be disseminated and extensive hands-on approach will be pursued to assure success of alternative livelihood ventures of coastal communities

Research and Institutional Development

Objective: to ensure that policy and decision-making is based on relevant and scientific information

Strategies:

1. Development of a coastal resources database to track state of the coastal resources and support sustainability and enhanced productivity of coastal resources.
2. Establishment of pilot areas for best available technologies on aquaculture, mariculture and silviculture in suitable areas.
3. Once piloted and proven successful, these aquaculture projects will serve as demonstration farms for technology-transfer and information dissemination.

Coastal Resources Management Awareness

Objective: to increase public awareness and community participation in coastal zone management

Strategies:

1. Development of a Unified Information, Education and Communication Materials on coastal and marine resources and environment and its management which shall be published in English and in vernacular.
2. For enhanced effectivity of the IEC campaign regular radio and television plugging will be undertaken for an extended coastal resource management outreach.
3. Video-Film Showing and Photo Exhibits will be undertaken during celebration of significant environment-related events. This will be a continuing and regular activity for schools, malls and other public places or ordinary and special occasions to intensify the awareness campaign. Aside from the usual lectures film showing on coastal and marine resource conservation and management will be undertaken for better understanding.

Waste Management and Pollution Control

1. Inter-LGU (provincial and municipal) dialogue and collaboration for the protection and maintenance of water quality of Hijo River.
2. Development of policies and regulations to encourage wastewater management in Local Government Units
3. Encourage wastewater recovery and safe use for agriculture and other purposes
4. Regular monitoring of the implementation of the Sanitation Code specially in Handling, Transport, Treatment and Disposal of Domestic Sludge and Septage
5. Provision of support and technical guidance in the water quality monitoring, domestic waste segregation and sewage treatment specially for eco-tourism and industrial facilities.
6. Periodic assessment of water quality and reporting of results
7. Sustain the Ecological Solid Waste Management Program in Local Government Units
8. Research feasibility for passage of a No Plastic Ordinance

Coastal Tourism

1. Development and promotion of community-based ecotourism packages
2. Promotion of tourism regulatory policies and standards as well as habitat protective measures that are ecologically sound
3. Enforcement of guideline for shoreline development (Provincial Foreshore Management Plan), coastal recreation and tourism packages

4.3 Five-year Investment Plan

In order to achieve the goals and objectives of the plan, investment targets have been set over a five-year period. These investments respond to the problems plaguing the coastal environment of the province, enhance strengths and explore opportunities for management. See Table 11 and 12 for Investment targets and costs.

Table 11. Five-year Investment Target, ICM Davao del Norte

Implementation Activities	Unit of Measure	Schedule/Target					Implementing Office/Agency
		Yr1	Yr2	Yr3	Yr4	Yr5	
1. Coastal Land Use and Zoning Program							PENRO
1.1 Location and Demarcation of Boundaries	Meeting	1					
1.2 Zoning Consultation Workshops	Training	4					
1.3 Development of Appropriate Plan for each Management Zone	no.		6				
1.4 Capacity Development for local coastal managers	no	1	1				
2. Fisheries and Habitat Management Program							
A. Mangrove Rehabilitation Project							PENRO
- Inventory & assessment	No.	1	1	1	1	1	
- Site Identification	No.	1	1	1	1	1	
- Propagules/seedlings procurement/production	No.						
- Mangrove Planting	ha	2	2	2	2	2	
- Maintenance and Protection	ha	2	2	2	2	2	
B. Seagrass Protection Project							PENRO
- inventory and assessment of seagrass meadows	no		1				
- expansion of marine protected areas to include seagrass meadows	no		1				
- seagrass transplanting in declared	ha		1	1	1	1	

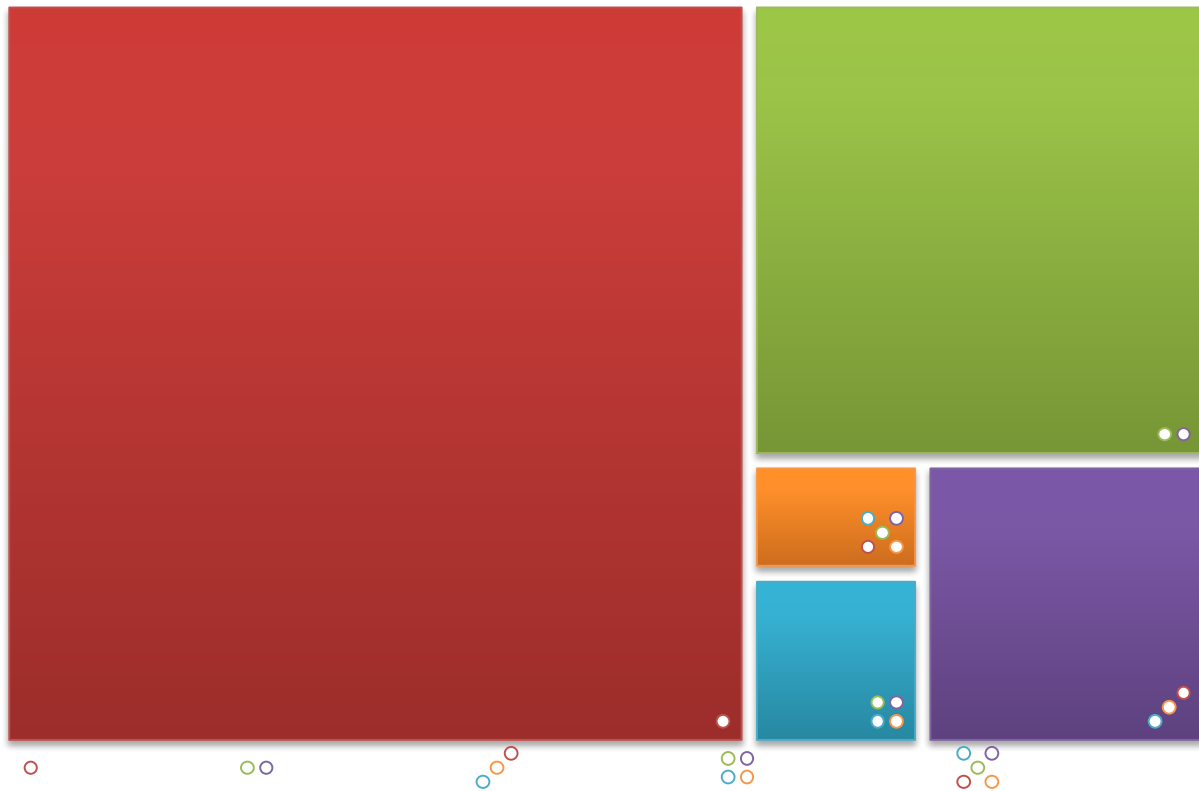
Implementation Activities	Unit of Measure	Schedule/Target					Implementing Office/Agency
		Yr1	Yr2	Yr3	Yr4	Yr5	
MPAs							
C. Coral Reef Protection and Conservation Project							PENRO
- establishment of Marine Protected Areas for coral reef protection	ha			2	2	2	
D. Protected Areas Management Project							PENRO
- Delineate and buffer Critical Habitat Range	no		1				
- Network & Linkage with Research Institutions & NGOs	no	1					
- Biophysical survey /assessment	no		1				
- Preparation of Mgt Plan	no		1				
- Enrichment Planting	no						
- Protection and Maintenance	no	10	10	10	10	10	
E. Riverbank Protection Project							PENRO
- Issuance and enforcement of ordinance	no	1	1	1	1	1	
- Survey of degraded riverbanks and inventory of Land Owners	no	5	5	5	5	5	
- Vegetative Buffering/Establishment of Greenbelt	ha	10	10	10	10	10	
- Protection and Maintenance	ha	10	10	10	10	10	
F. Fisheries Enhancement Project							PAGRO
- Fingerlings Dispersal	no	1,000	1,000	1,000	1,000	1,000	
- Support to fish sanctuary management	No	1	1	1	1	1	
- Support to tilapia and hito hatchery	No	1	1	1	1	1	

Implementation Activities	Unit of Measure	Schedule/Target					Implementing Office/Agency
		Yr1	Yr2	Yr3	Yr4	Yr5	
- Geotagging of fishery production area	No	1	1	1	1	1	
G. Waste Management Project							
A. Wastewater Management - encourage LGUs	No	12	12	12	12	12	PENRO
B. Water Quality Assessment and Monitoring	No	12	12	12	12	12	
C. Ecological SWM Program	No	12	12	12	12	12	
D. Feasibility Study - No Plastic	No		1				
H. Fisheries Law Enforcement	No	1	1	1	1	1	PAGRO
- Creation and deputization of a Network of law enforcement units (DDN)	No		1	1	1	1	
- Enforcer's training	No		1	1	1	1	
- Orientation of Bantay-Dagat (Coastal Watch)	No		1	1	1	1	
- formulation of a unified policy on fishing	No		1		1		
- meetings and trainings	No	2	2	2	2	2	
3. Livelihood and Enterprise Management in the Coastal Zone							
1. Establishment of cottage industries	No	2					PADO
2. Fingerlings dispersal	No	1,000	1,000	1,000	1,000	1,000	PAGRO
3. Seaweed Culture Research	No		1				PAGRO
4. Research and Institutional Development Program							

Implementation Activities	Unit of Measure	Schedule/Target					Implementing Office/Agency
		Yr1	Yr2	Yr3	Yr4	Yr5	
A. Coastal Resources Database Management Project							
1. Fisheries Profiling	no		2		2		PENRO, PPDO
2. Vulnerability Assessment (TURF)	No		4				
B. Strengthening of ICM Institutions							
1. Creation of the ICM-Program Coordinating Unit	No	1					PENRO
2. Linkages with NGO, NGA, Academe	No	4					
3. Policy Support	No	1					
4. Forging of MOA	No	1					
C. Capacity Building for LGUs/POs							
1. Exposure to Model Sites and Best Practices	No	1		1		1	PENRO, PAGRO
2. Training of trainers	No		1		1		
5. Coastal Resources Awareness Program							
1. State of the Coastal Environment Report	no	1	1	1	1	1	PENRO
2. IEC Materials Development and Reproduction (Animations, videos, broadcast, print)	No		1		1	1	PICKMO
3. World Ocean Month Celebration	No	1	1	1	1	1	PENRO, PAGRO
4. Orientation Sessions	No	2	2	2	2	2	PENRO
5. Fish Conservation Week Celebration	no	1	1	1	1	1	PAGRO

Table 12. Summary of Investment and Fund Sources

Implementation Activities	Investment Cost					Fund Sources
	Year 1	Year 2	Year 3	Year 4	Year 5	
1. Coastal Land Use and Zoning Program	300,000.00	300,000.00	300,000.00			5% Disaster Preparedness and Mitigation Fund (currently under the project name, Integrated Coastal Management Project)
2. Fisheries and Habitat Management Program						
A. Mangrove Rehabilitation Project	1,000,000.00	1,100,000.00	1,300,000.00	1,400,000.00	1,500,000.00	20% Local Development Fund
B. Seagrass Protection Project		200,000.00	250,000.00	300,000.00	350,000.00	5% Disaster Preparedness and Mitigation Fund
C. Coral Reef Protection and Conservation Project		100,000.00	100,000.00	100,000.00	100,000.00	5% Disaster Preparedness and Mitigation Fund
F. Protected Areas Management Project	2,700,000.00	2,700,000.00	2,700,000.00	2,700,000.00	2,700,000.00	5% Local Development Fund (currently under the project name, Restoration of Forest Cover)
E. Riverbank Protection Project	635,000.00	650,000.00	650,000.00	650,000.00	650,000.00	20% Local Development Fund
F. Fisheries Enhancement Project	300,000.00	350,000.00	350,000.00	350,000.00	350,000.00	20% Local Development Fund
G. Coastal Waste Management Project		200,000.00	250,000.00	250,000.00	300,000.00	5% Disaster Preparedness and Mitigation Fund
3. CRM Research and Institutional Development Program			200,000.00	200,000.00	200,000.00	20% Local Development Fund
4. Coastal Resources Awareness Project		100,000.00	100,000.00	150,000.00	150,000.00	5% Disaster Preparedness and Mitigation Fund
Total	4,935,000.00	7,935,000.00	6,200,000.00			



V. Implementation arrangements

Organization and management

The implementation of the Five-year Provincial ICM Plan of Davao del Norte calls for support by a wide range of government agencies at the local, provincial and national levels. It takes a combined team of government, academe, NGO and civic organizations to carry out overall planning, management and monitoring and evaluation to ensure that there is ample cross-sectoral review and adequate exchange of information among implementing agencies. At the provincial level, it is a shared task and responsibility of the PENRO, PAGRO, PPDO, PHO and Tourism Office. The PENRO shall however take the lead as a coordinating unit of ICM-related Programs within the provincial government and shall oversee the implementation of the Provincial ICM Plan.

The other offices and agencies tasked with implementing the ICM programs and projects shall operate in the context of an interagency coordinating structure for ICM. This inter-agency and inter-sectoral coordinative mechanism is deemed necessary to avoid fragmentation of government responsibilities and duplication of efforts of different sectors involved in the coastal management and sustainable development programs and maximize scarce resources.

programs identified in the plan.

The ICM-Program Coordinating Committee shall be composed of technical specialists and resource persons from the following agencies/offices:

1. Provincial Government Offices
2. The Academe
3. Coastal Local Government Units
4. Civil Society Organizations
5. Bureau of Fisheries and Aquatic Resources
6. Department of Environment and Natural Resources Office
7. Provincial Tourism Council

The ICM Program Coordinating Committee shall have the following function:

1. Discuss and plan strategies to align services, ensure that there are no gaps, and conserve scarce resources.
2. Discuss and provide perspective on inter-boundary issues and concerns
3. Provide counsel to the provincial government in the development of ICMP Action Plans and help guide the ongoing administration of the program, as appropriate.
4. Weigh in on any proposed changes to ICM-related policies.
5. Advocate for their agencies stakes and interests and keep other members informed about their perspectives.

PENRO will act as the Secretariat of the Committee and shall have the following functions:

1. Prepare meeting agendas
2. Document the IPCC's input
3. Facilitate Coordinating Committee meetings
4. Prepare interim work products for committee review

Budgetary Requirements

The Provincial Government thru the Local Development Fund and the Disaster Prevention and Mitigation shall initially fund the implementation of the Integrated Coastal Management Plan. To augment financial resources, the Province shall seek support from other national government agencies concerned in ICM and from the

particularly on priority actions on research and information database development and special projects.

Monitoring and Evaluation

The province shall adopt a Results-Based Monitoring and Evaluation (RBME) system to ensure that program success is determined through a measurable criterion by which results/impacts/outputs of various development activities are monitored and evaluated. Management will be a continuing effort. Strategies and actions shall be evaluated and revised as necessary for best management results. These regular evaluation and reports on the progress of the project implementation shall be conducted so that issues and problems that cropped-up are resolved timely and appropriately. The project reports and updates shall be submitted monthly or as the need arise. The project report shall cover activities as specified in the implementation schedule. The report will be submitted to the LCE and other stakeholders.

Performance measurement framework

Results	Performance Indicator	Means of Verification	Frequency of Monitoring	Responsible Office (Data collection)
Goals				
Improved environment quality for safe and risk resilient community	Coastal habitat conditions improved to good or fair	Assessment report State of the coastal environment report	Cumulative – Five years	PENRO/PAGRO
Outcome				
Key biodiversity and coastal habitat areas increased	Ha of coastal habitat areas	Assessment report State of the coastal environment report	Annual	PENRO
Fisheries productivity enhanced	% increase in commercial and municipal fisheries production	Regional reports	Annual	PAGRO/PPDO
Essential tools and structures for sustainable integrated	No. of policies and guidelines released	Reports Policy releases	Annual	PENRO

Results	Performance Indicator	Means of Verification	Frequency of Monitoring	Responsible Office (Data collection)
coastal management are in place.	through recommendations from the ICM-Program Coordinating Committee	Resolutions		
Output				
Coastal Land Use and Zoning Plan developed	No. of zoning consultation workshops conducted No. of zoning management plan prepared	Zoning management plans	Annual	PENRO
Mangrove area planted/rehabilitated	Ha of mangrove rehabiliatted Ha of mangrove areas assessed	Accomplishment reports	Annual	PENRO/PPDO
MPAs for coral reef protection established	No. of MPAs established	Accomplishment reports	Annual	PENRO/PPDO
Seagrass transplanted on	No. of inventory reports of	Accomplishment	Annual	PENRO/PPDO

Results	Performance Indicator	Means of Verification	Frequency of Monitoring	Responsible Office (Data collection)
declared MPAs	seagrass meadows Ha of seagrass transplanted	reports		
Protected areas managed	Ha of protected area rehabilitated	Accomplishment reports	Annual	PENRO/PPDO
Riverbank rehabilitated	Km of riverbank rehabilitated	Accomplishment reports	Annual	PENRO/PPDO
Fisheries production increased	No. of fingerlings dispersed No. of fishery production areas geo-tagged	Accomplishment reports	Annual	PAGRO
Patrolling, monitoring and enforcement activities are improved		Accomplishment reports	Annual	PAGRO
Waste managed	No. of water quality assessment and monitoring conducted	Accomplishment reports	Annual	PENRO/PPDO
Coastal resources database	No. of coastal data based	Accomplishment	Annual	PENRO/PPDO

Results	Performance Indicator	Means of Verification	Frequency of Monitoring	Responsible Office (Data collection)
established	maintained No. of LGUs with Fisheries Profile and TURF	reports		
Coastal managers trained	No. of coastal managers trained	Accomplishment reports	Annual	PENRO
Public awareness and community mobilisation campaigns designed and implemented	No. of IEC materials developed No. of audience reached State of coastal environment report prepared	Accomplishment reports	Annual	PENRO/PICKMO