Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
Provincial Environment and Natural Resources Office

September 14, 2023

MEMORANDUM

FOR : The Regional Executive Director
DENR – MIMAROPA Region

THRU : The OIC, Assistant Regional Director for Technical Services

FROM : The OIC, PENR Officer
Oriental Mindoro

SUBJECT : **SUBMISSION OF THE ACCOMPLISHED VERDE ISLAND PASSAGE PROTECTED AREA SUITABILITY ASSESSMENT (VIP PASA) FORMS I AND II IN THE PROVINCE OF ORIENTAL MINDORO**

Submitted are the documents pertinent to the Verde Island Passage Protected Area Suitability Assessment (VIP PASA) covered by the province of Oriental Mindoro. These documents primarily comprise of the accomplished Forms I (On-Site Observation) and II (Key Informant Interviews) for the assessment conducted by the Oriental Mindoro VIP PASA team. Pursuant to the BMB Technical Bulletin No. 2016-04: *Clarifying the Procedural Guidelines in the Conduct of Protected Area Suitability Assessment (PASA).*

Only including the municipalities from Puerto Galera to Gloria, supplementary data acquired for the PASA of Oriental Mindoro covering the Verde Island Passage were obtained from the following existing references of municipality obtained from the Provincial Agricultural Office and records of the DENR PENRO Oriental Mindoro:

- Forest Land-Use Plans (FLUPs) of municipalities from Puerto Galera to Gloria – obtained from the archives of DENR PENRO Oriental Mindoro
- State of the Coasts – obtained from Provincial Agricultural Office (PAgO)
- Provincial Development and Physical Framework Plan (PPDFP) 2016-25 – obtained from Provincial Planning and Development Office (PPDO)
- Integrated Coastal Management (ICM) Plan of Oriental Mindoro 2019-23 – also obtained from PPDO

For information, compliance and reference.

ALAN L. VALLE

Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
Provincial Environment and Natural Resources Office

September 15, 2023

MEMORANDUM

FOR : The Regional Executive Director
DENR – MIMAROPA Region

THRU : The Assistant Regional Director for Technical Services

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For information, compliance and reference.

NEIL EDGAR DEX P. MARZA
Coastal Extension Officer

PENRO Tracking No.: 2309000762
TSD-CDS/nedpm

PASA Form No. 1
PROTECTED AREA SUITABILITY ASSESSMENT (PASA)
(ON-SITE OBSERVATION)

Name of Proposed Protected Area (PA): _____
Location of Study Site: Province of Oriental Mindoro
Date of Assessment/s: February 2023; May 2023 – June 2023

GENERAL INFORMATION

Oriental Mindoro covers the second largest portion of the Verde Island Passage in its jurisdiction next to Batangas. It encompasses the VIP through the municipalities of Puerto Galera, San Teodoro, Baco, Calapan City, Naujan, Pola, Pinamalayan and Gloria (*Figure 1*). Further municipalities southward (Bansud, Bongabong, Roxas, Mansalay and Bulalacao) are not include in accordance to the expanded VIP Marine Protected Area and Law Enforcement Network (2017). Moreover, the municipalities of Victoria and Socorro will be considered irrelevant to the VIP PASA due to their landlocked geographical states only tied along a freshwater body (Naujan Lake). Overall, only eight (8) out of the 15 administrations (7 municipalities and 1 city) of Oriental Mindoro will only be assessed for the submission of VIP PASA Forms 1 and 2.

Geographic Location

The province of Oriental Mindoro (*Lalawigan ng Silangang Mindoro*) is located on the Island of Mindoro under the MIMAROPA Region in Luzon. It is bordered to the north by the Verde Island Passage (VIP), to the west by its neighboring Occidental Mindoro, to the east by Marinduque and Romblon Islands and to the south by several islands of Antique.

Land Area (ha)

The province of Oriental Mindoro is composed of a total of 14 municipalities and one (1) city with an overall area of approximately 423,838 ha. Exclusively measuring the municipalities/cities of Oriental Mindoro covering the Verde Island Passage, the VIP areas of the province spans an approximate of 233,737.07 ha, about 55.15% of the total provincial area.

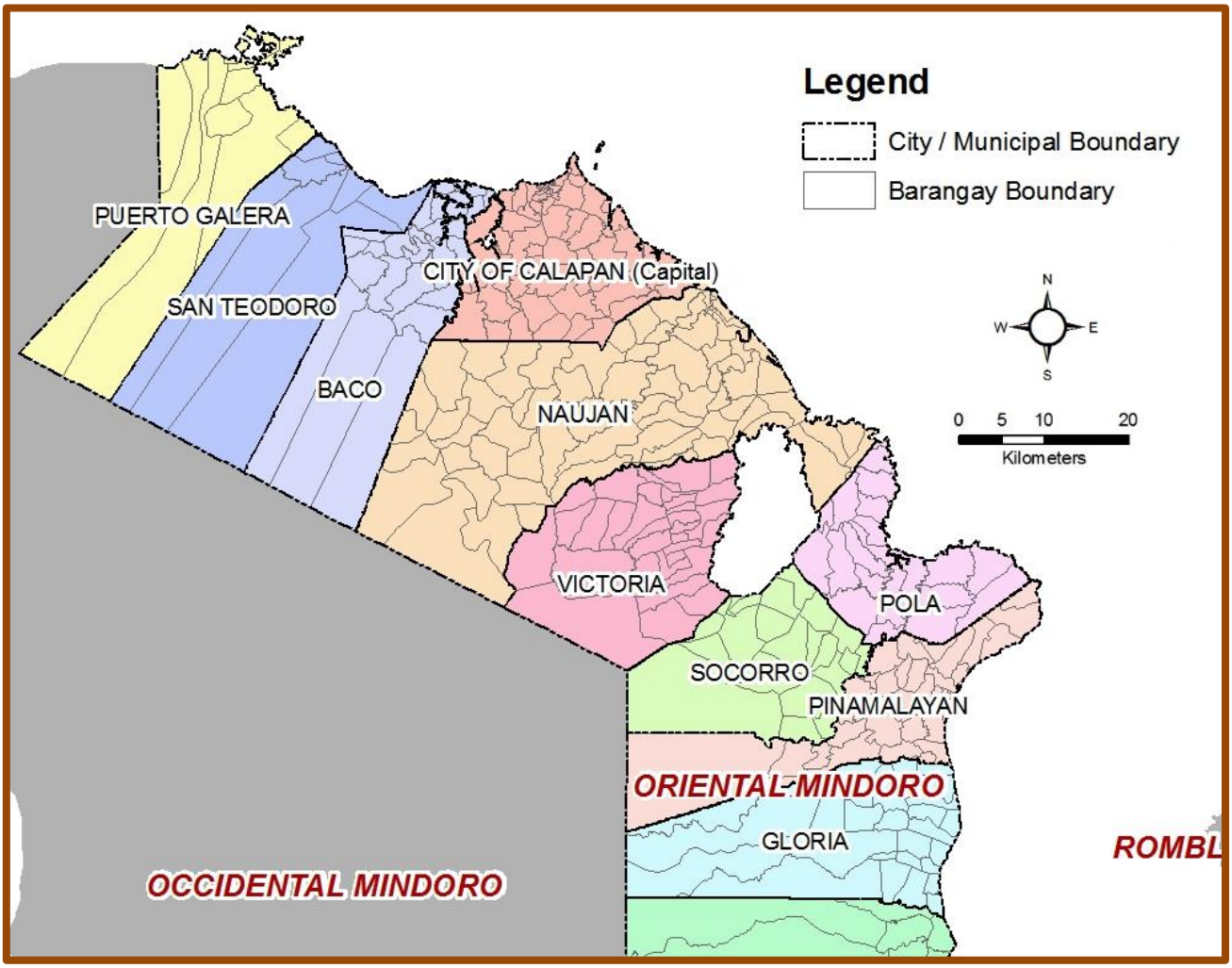

Figure 1. Political boundary map showing the seven (7) municipalities and one (city) of Oriental Mindoro covering the Verde Island Passage (NSO, 2000)

Table 1. Summary of Land Area obtained from existing FLUP's and coordination with LGUs of municipalities of Oriental Mindoro covered within the Verde Island Passage (VIP)

Municipality / City	Total Land Area of Municipality (ha)
Puerto Galera	26,392.76
San Teodoro	36,910.63
Baco	31,126.00
Calapan City	18,676.00
Naujan	52,804.00
Pola	16,032.68
Pinamalayan	23,766.00
Gloria	28,029.00
TOTAL	**233,737.07**

Coastal Area and Municipal Waters

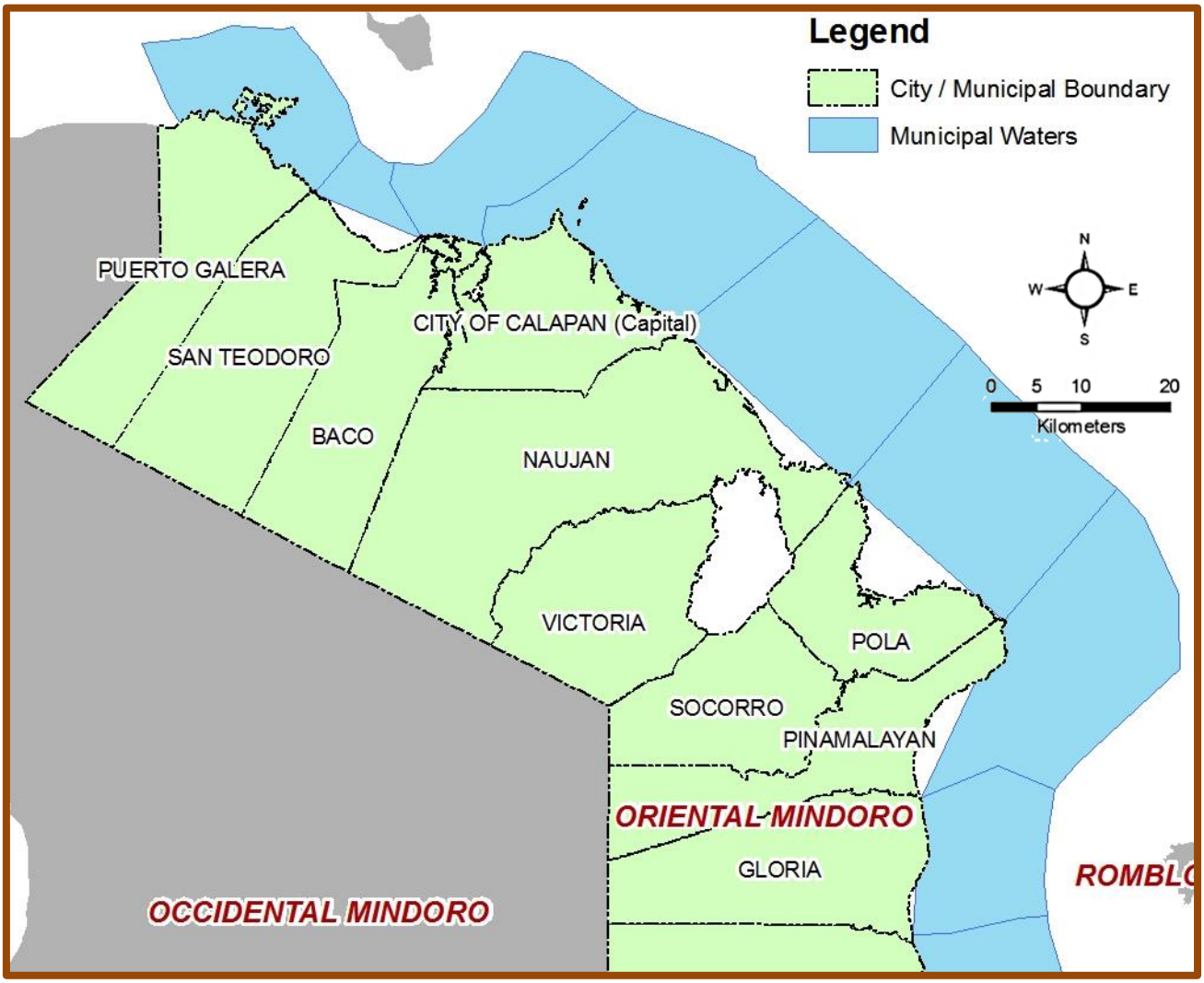

Figure 2. Map of municipal waters showing the seven (7) municipalities and one (city) of Oriental Mindoro covering the Verde Island Passage (NSO, 2000)

The 13 coastal administrations (municipality / city) of Oriental Mindoro comprise an overall approximate of 310,788 ha of coastal waters. The whole province spans across a total of 342.45 km coastline from Puerto Galera to Bulalacao. In terms of VIP coverage, the municipalities from Puerto Galera to Gloria cover a total of approximately 166,266 ha coastal waters (UPMSI and PGORM-PAgO, 2019). The coastal zones are characterized by gentle slope with gradual descent from 0° to a slope of about 50° across trenches along the Verde Island Passage. These locations are potentially suitable spots for breeding spots for fish and other marine resources as they are “hooked” by these nooks while being carried by the strong currents of VIP at the norther parts of Oriental Mindoro (Lavides et al. 2016). Moreover, these slope mechanisms provide a favorable spot for watercraft harbors.

Out of the 40 established Marine Protected Areas in Oriental Mindoro, a total of 28 established MPAs are recorded within the VIP areas of Oriental Mindoro from Puerto Galera to Gloria (*Table 2*), with Pola possessing the highest number of MPAs (7). Moreover, the Puerto Galera MPA, established in 2006, is also the considered the largest among the recorded MPAs measuring about 4,828.00 ha.

Table 2. Established MPAs within the VIP areas of Oriental Mindoro and their areas

Municipality	No. of Established MPAs	Total Area Covered by MPAs (ha)
Puerto Galera	2	4,845.80
San Teodoro	3	257.47
Baco	1	152.23
Calapan City	5	362.04
Naujan	3	142.59
Pola	7	597.38
Pinamalayan	4	105.03
Gloria	3	241.13
TOTAL	**28**	**6703.97**

Source: PGORM-PAgO, 2019

Total Number of Coastal Cities / Municipalities

A total of 78 coastal barangays were recorded in the municipalities of Oriental Mindoro from Puerto Galera to Gloria (*Table 3*). Based on the table below, it can be observed that the coastal barangays in the municipality of Puerto Galera have the highest percent coverage in relation to the total area of the municipality (68.78%). This indicates that Puerto Galera is mainly composed of coastal barangays followed by Pola (35.93%). Overall, these 78 coastal barangays in the VIP municipalities and city of Oriental Mindoro constitute a total of 166,266.85 ha.

Table 3. Coastal barangays of the seven (7) municipalities and one (1) city of Oriental Mindoro covering the Verde Island Passage (VIP)

Municipality / City	No. of Coastal Barangays	Total Area of Coastal Barangays (ha)	Percent (%) Coverage of Coastal Barangays with Total Area of Municipality / City
Puerto Galera	**12**	**13,916.91**	**68.78%**
San Teodoro	4	4,520.27	7.65%
Baco	4	16,004.16	3.22%
Calapan City	18	26,726.81	8.47%
Naujan	11	29,619.73	10.32%
Pola	**11**	**30,994.38**	**35.93%**
Pinamalayan	10	30,800.53	17.25%
Gloria	8	13,684.06	8.99%
TOTAL	**78**	**166,266.85**	

Population

Based on the 2020 survey data from the continuing project, PhilAtlas, the province of Oriental Mindoro has a total population of 908,339 (as of 2020 obtained from the Philippine Statistics Authority). Relative to its approximate area of 4,238.38 km^2 (423,838 ha), it has a density of 214/km^2 and has an annual growth rate of 1.56% in congruence to the baseline data of the Provincial Planning and Development Office from 2020-25 (PDPFP - Oriental Mindoro 2016-25).

a. Historical Population

Over the course of 117 years starting 1903, the population of Oriental Mindoro grew from 26,359 to 908,339 in 2020, an increase of 881,980 people (*Figure 3*). According to the predictions from the PhilAtlas project, the latest census figures in 2020 denote a positive growth rate of 1.56%, or an increase of 64,280 people, from the previous population of 844,059 in 2015. This is also in agreement with the data obtained from the PDPFP of Oriental Mindoro.

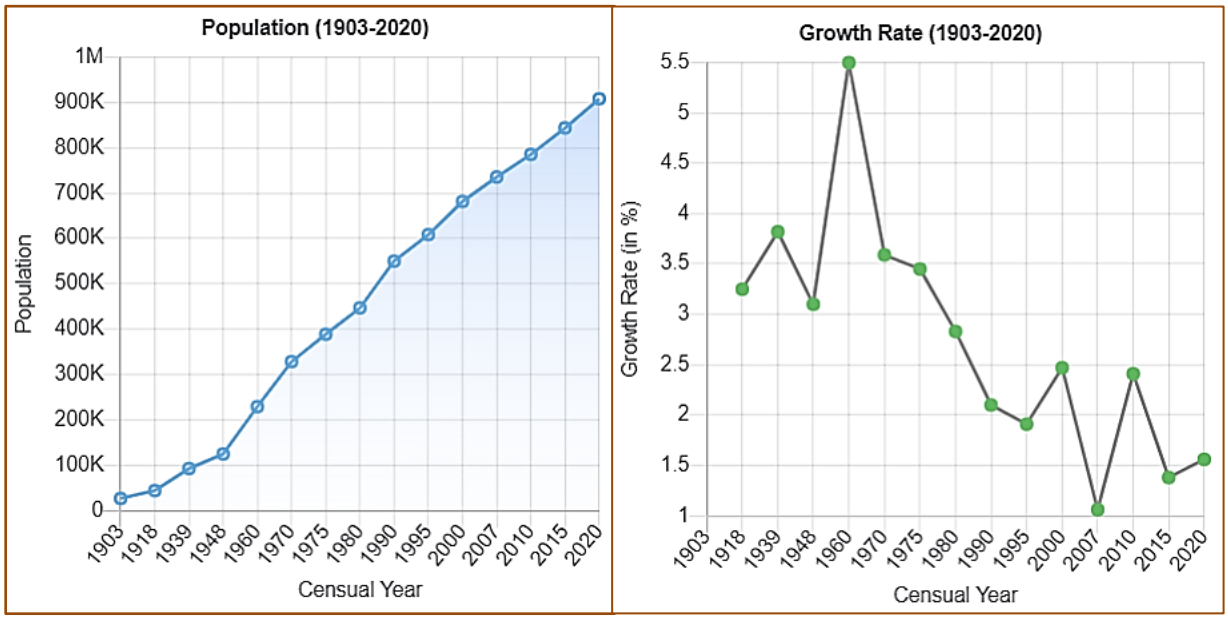

Figure 3. Population growth count (left) and rate (right) of the population of Oriental Mindoro since 1903 (over the last 117 years) (obtained from PhilAtlas.com, 2023)

b. Age Structure

Considering the age groups measured in *Figure 4*, young dependents (individuals under 15 years old) make up the most of the population in terms of age group with a total of 32.03%. This is followed by the working-age / economically-active individuals (15-64 years old) comprising 64.47%, the highest among the population aggregate groups. Lastly, old dependents (64 years old and above) only encompass 5.50% of the population.

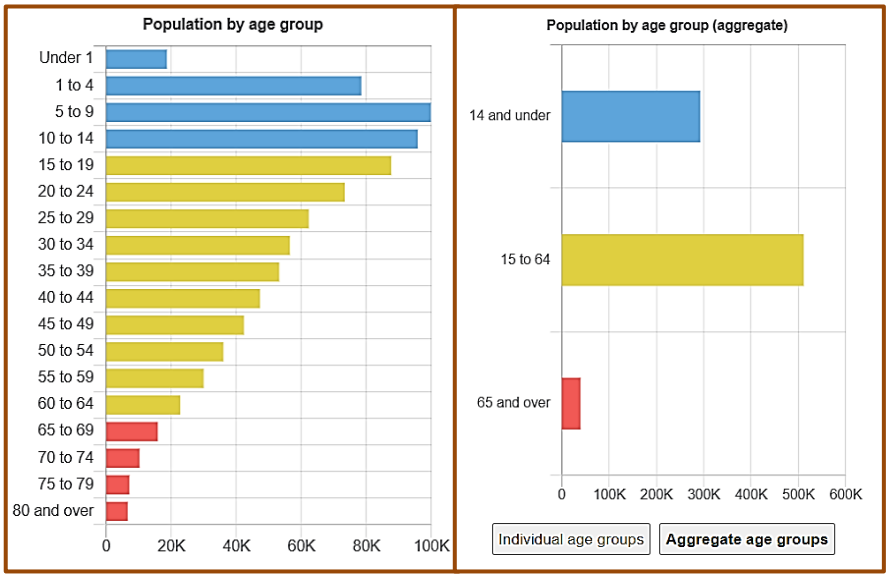

Figure 4. Age distribution by individual (left) and aggregate (right) of Oriental Mindoro Population as of 2020 Census Survey from the Philippine Statistics Authority (PSA)

c. Sex Distribution (Male/Female Ratio)

As per surveys from May 2020, a ratio of 50.61%:49.39% among males to females is observed in the province of Oriental Mindoro. This sex ratio ultimately stands at 102 males per 100 females, only slightly higher than the previous 2015 survey (103 males / 100 females).

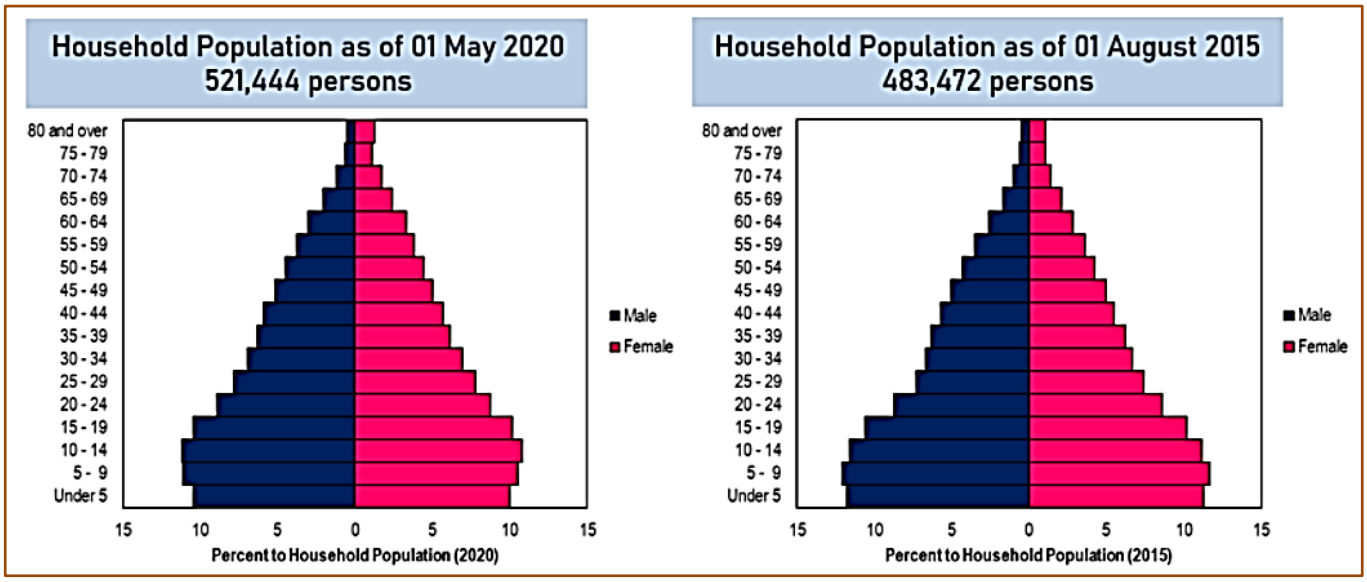

Figure 5. Male/Female distribution of the Oriental Mindoro population as of 2020 (left) and 2015 (right) obtained from the Philippine Statistics Authority (PSA)

Topography

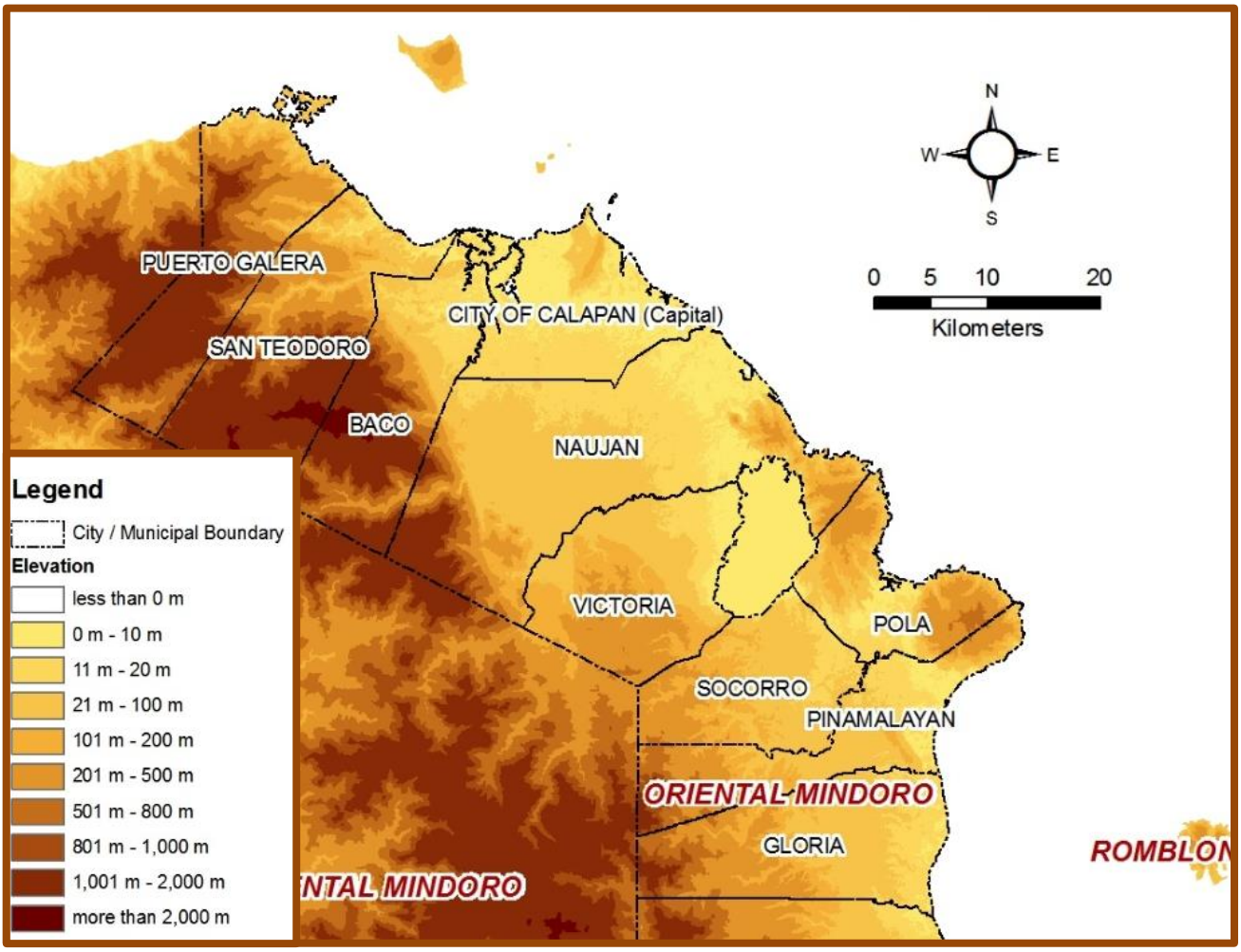

Figure 6. Topographic Map showing the elevation ranges of the municipalities of Oriental Mindoro encompassing the Verde Island Passage (SRTM, 2018)

a. Elevation

Based on the topographic map shown above (*Figure 6.*), the VIP areas of Oriental Mindoro mainly have low to moderate elevation range from the areas of Calapan City southward to Gloria. Higher elevations are observed along the municipalities of Puerto Galera, San Teodoro and almost half of Baco, where the highest peak, Mt. Halcon is located. Covering about __% of Baco, Mt. Halcon is considered as the highest mountain in the Island of Mindoro and the third highest mountain in the Philippines measuring about 2.6 km above sea level (FLUP of Baco, 20__).

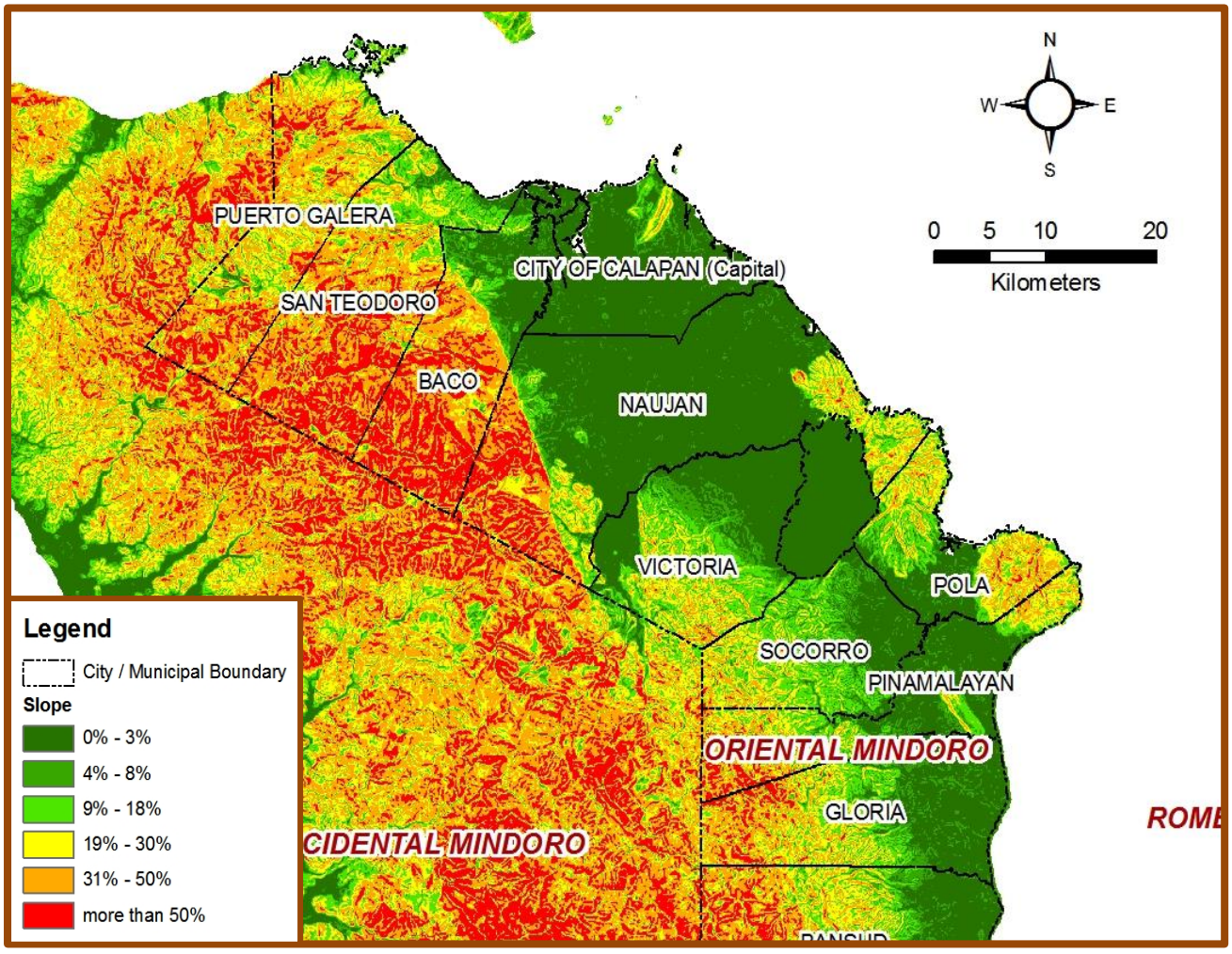

Figure 7. Slope map of the municipalities of Oriental Mindoro covering the Verde Island Passage (VIP) (SRTM, 2008)

b. Slope

Based on the slope map above (*Figure 7.*), the Calapan City and Naujan are generally composed of plains with zero to very low slopes. Moreover, the coastal areas in the municipalities of Pola, Pinamalayan and Gloria tend to have areas varying from 0-50% slopes. However, a portion of the near-shore areas in these three (3) municipalities tend to have higher slopes (19% - 50%) due to their cliffside nature. In relation to the topographic map shown in *Figure 6*, the municipalities of Puerto Galera, San Teodoro and Baco from which Mt. Halcon is located are observed to have the highest slopes among the VIP areas of Oriental Mindoro.

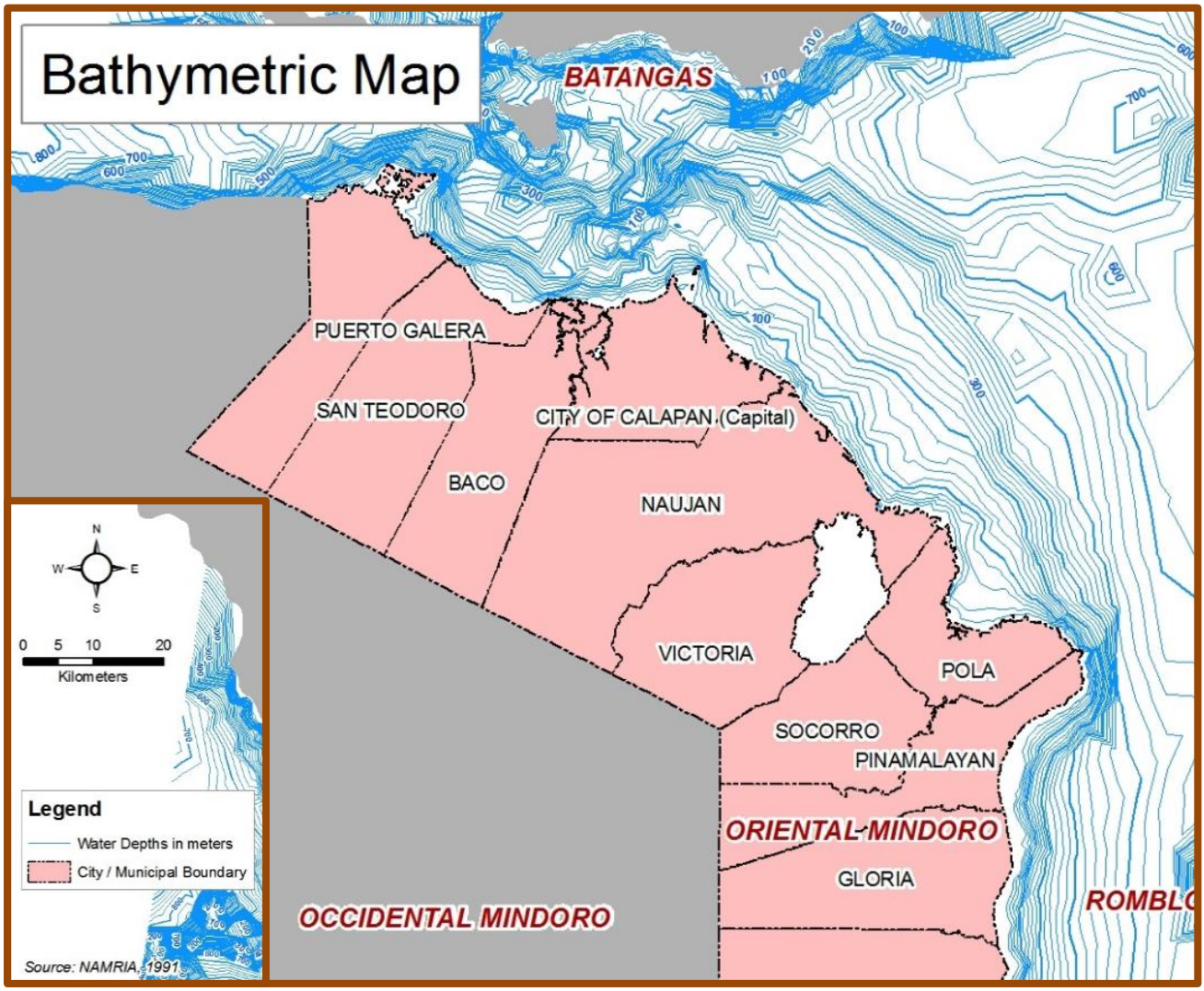

Figure 8. Bathymetric Map of the municipalities of Oriental Mindoro encompassing the Verde Island Passage (NAMRIA, 1991)

c. Bathymetry

Based on the bathymetric map shown above (*Figure 8*), the municipal waters of Puerto Galera, San Teodoro and Baco are observed to possess greater depths. The faster and stronger currents observed in these areas brought about by the flow of the Verde island Passage may be a probable factor to these observed depths. Meanwhile, the coasts of Calapan City, Naujan and the northern portions of Pola are observed to have shallower waters. The low average depth recorded along these areas may be indicative of the presence and abundance of seagrass ecosystems.

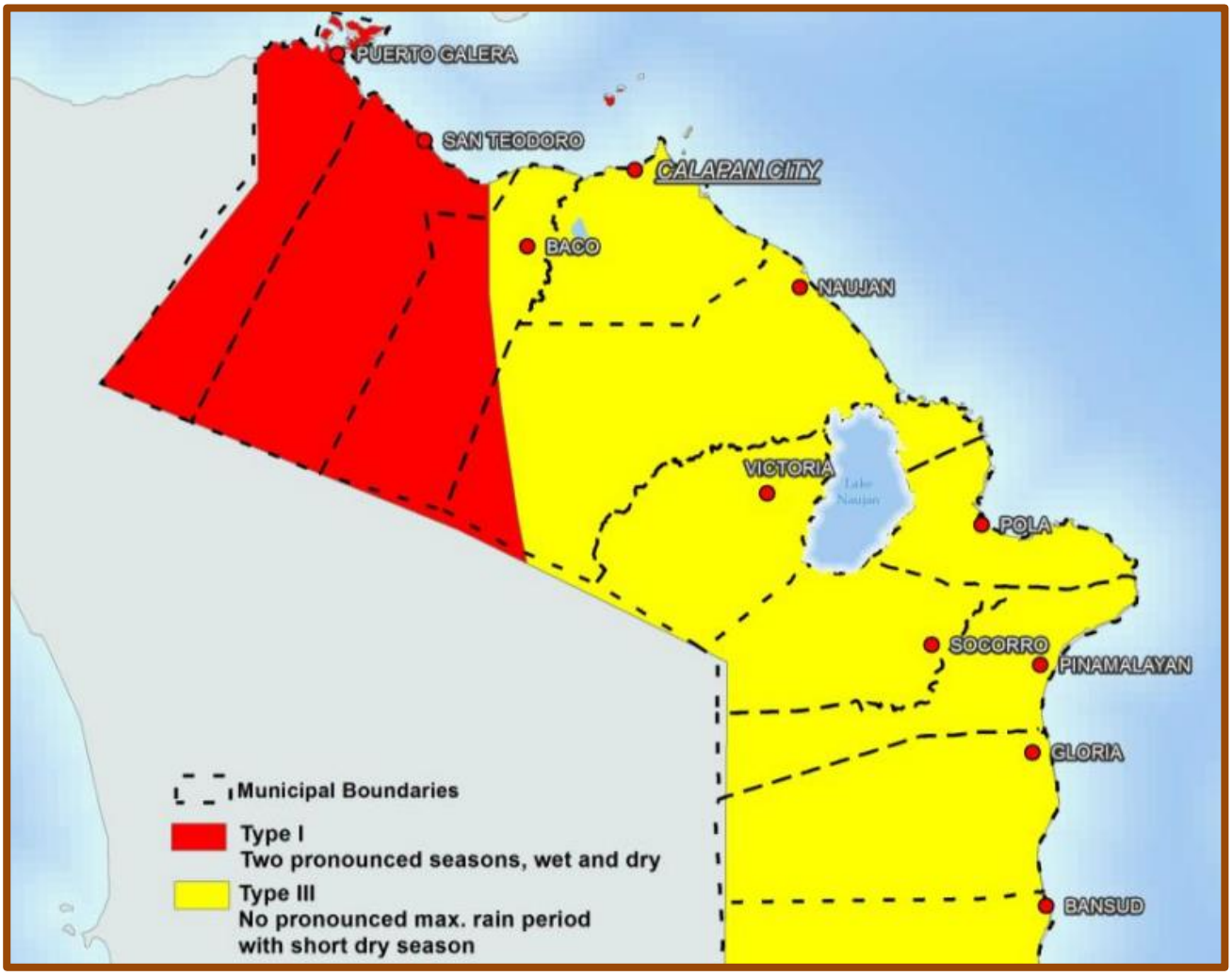

Figure 9. Climate map of the seven (7) municipalities and one (1) city of Oriental Mindoro covering the Verde Island Passage (VIP) (ICAMP, 2015)

Climate

The province of Oriental Mindoro generally has two climates: Type I and Type III (PPDFP Oriental Mindoro, 2016). Type I climate is generally experienced by the municipalities of Puerto Galera, San Teodoro and high-elevation areas of Baco and Naujan having two (2) pronounced seasons, dry and wet. On the other hand, Type III climate is experienced by the rest of the municipalities within VIP coverage having no pronounced season. The mean annual rainfall in the province has an approximate of 2,285mm/yr which can reach up to 177 mm/day.

Vulnerability from Natural and Anthropogenic Hazards

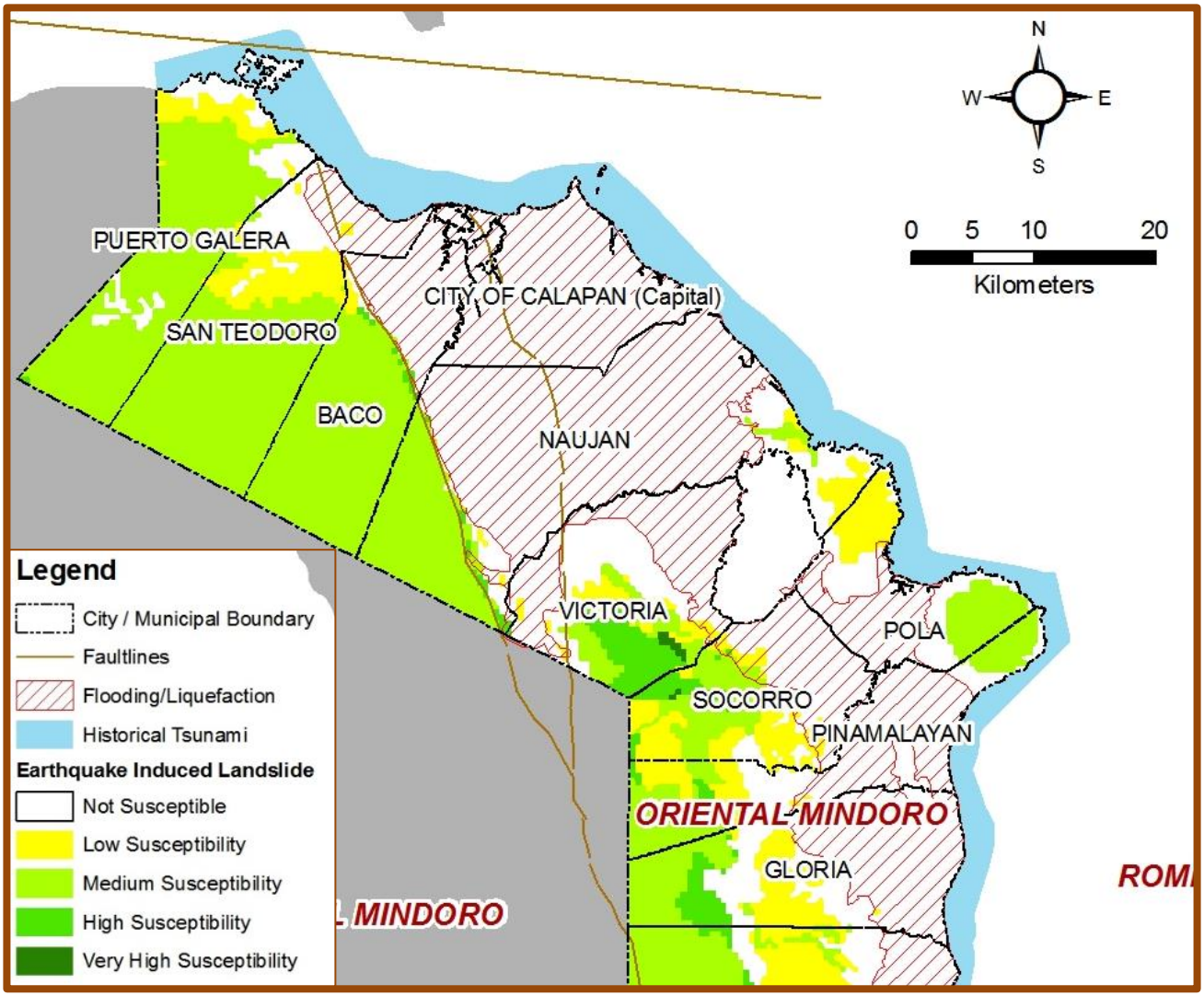

Figure 10. Geohazard Map showing hazard susceptibility of the municipalities of Oriental Mindoro encompassing the Verde Island Passage (PHIVOLCS / MGB, 2023)

a. Geo-Hazard Susceptibility

With the previous topographic observations from *Figure 10*, it is expected observe high susceptibility to geohazards (i.e., earthquake-induced landslides for the municipalities of Puerto Galera, San Teodoro and the southern portion of Baco from their high elevation areas due to their mountainous nature. Similar observations with the previously mentioned factor can also be made in a few areas of Pola, Pinamalayan and Gloria. Subsequently, the low elevation ranges in the coastal areas of Baco, Calapan City, Naujan and portions of Pola, Pinamalayan and Gloria indicate higher susceptibility to flooding.

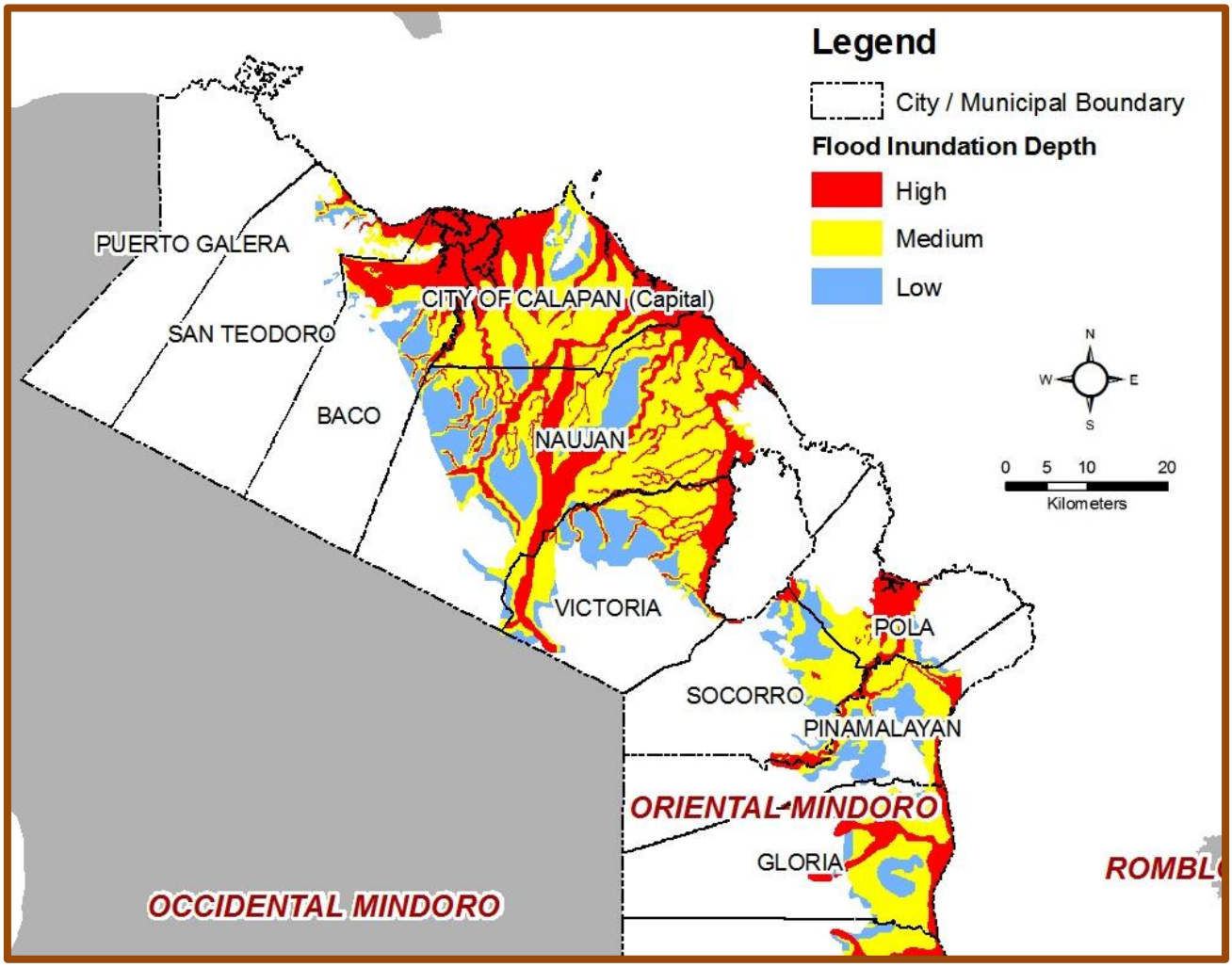

Figure 11. Flood Susceptibility Map showing the municipalities of Oriental Mindoro encompassing the Verde Island Passage (MGB, 2023)

b. Flood Susceptibility

In relation to the previous map on geohazards among the VIP areas of Oriental Mindoro, high susceptibility to floods is mostly observed across the coasts of Baco, Calapan City and Naujan. Medium to high susceptibility can also be observed past the coastal areas of these three municipalities that may be caused by the river systems overflowing during stormy seasons. Flood-prone areas with high susceptibility can also be observed along Gloria and Pinamalayan coasts, as well as in the mouth of the cove of Pola coasts.

Agriculture

Rice and fishery production are among the predominant agricultural resources of Oriental Mindoro. This is followed by the top fruit produce of the province such as bananas, lanzones and mangoes (State of the Coasts of Oriental Mindoro, 2019). As of 2018, the municipality of Naujan contains produced the highest farmed rice followed by Calapan City (*Table 4.*) with irrigated area covering about 13,030 ha and 7,719 ha, respectively. This is contributory of Naujan and Calapan City having the highest number of farmers.

Table 4. Rice production by city/municipality of Oriental Mindoro within the VIP

City / Municipality	No. of Farmers	Area harvested (ha)	Annual Production (MT)	Average Yield (MT/ha)
Puerto Galera	18	101.00	333.15	3.30
San Teodoro	285	856.00	3,816.40	4.46
Baco	1,936	5,337.50	22,015.15	4.12
Calapan City	**3,625**	**16,203.00**	**90,642.11**	**5.59**
Naujan	**6,097**	**30,695.20**	**166,463.46**	**5.42**
Pola	959	3,002.00	17,085.31	5.69
Pinamalayan	2,621	8,043.90	35,958.05	4.47
Gloria	1,836	5,249.50	20,716.92	3.95

~ Data as of 2018 obtained from PAgO-OrMin ~

Fisheries

Fishing is a major source of livelihood especially for coastal dwellers in the province of Oriental Mindoro. Marine resources such as fish, shellfish and plant-based products are generally obtained along the Verde Island Passage by northern municipalities such as Puerto Galera and San Teodoro. On the other hand, municipalities such as Gloria and the other following municipalities southward obtain the marine resources from the Tablas Strait. Meanwhile, freshwater resources are mainly acquired through the recorded 24 lakes in the province particularly in highly regarded areas such as Naujan Lake, Caluangan Lake and Calapan Bay (PAgO, 2019).

As of 2018, fish production in the province capped at about 802.04 metric tons (MT) with 256.65 MT per capita fish consumption (Oriental Mindoro Facts and Figures, 2018). The municipality of Bulalacao covers the highest fishery production for about 59,250.33 ha as of 2018. Among the VIP municipalities/city of Oriental Mindoro, Pinamalayan covers the highest production (State of the Coasts of Oriental Mindoro, 2019).

BIO-PHYSICAL FEATURES

A. Geological Features

Municipality of Puerto Galera

The municipality of Puerto Galera spans across an approximate area of 18,152.30 ha. A total of 12 out of 13 coastal barangays can be found within its jurisdiction constituting about 68.78% of the municipality's total area. This may be brought about by the several islands and islets in the further northern areas that make up the municipality.

Puerto Galera is generally composed of rolling topography consisting of peaks and promontories that dominate the inland areas. Several rounded mountain ridges are also present in most slopes, indicative of weathering occurrences against resistant rocks.

Table 5. Coastal Barangays of Puerto Galera

PUERTO GALERA	Area (ha)
Aninuan	2306.00
Balatero	1141.79
Dulangan	754.40
Palangan	148.20
Poblacion	164.05
Sabang	207.77
San Antonio	89.08
San Isidro	1056.14
Sto. Niño	377.48
Sinandigan	106.12
Tabinay	9009.25
Villaflor	2792.02
TOTAL	**18,152.30**

Source: Forest Land-Use Plan of Puerto Galera, Oriental Mindoro, 2021

Municipality of San Teodoro

The municipality of San Teodoro spans across an approximate area of 52,804.15 ha. A total of 11 out of 70 coastal barangays can be found within its jurisdiction constituting about 10.32% of the municipality's total area *(Table 6)*.

San Teodoro faces the Subaan Bay with a background on hilly and broken ridges trailing towards the boundary line between Oriental and Occidental Mindoro. It is predominantly composed of forestlands constituting about 83% of the municipality's total area, followed by Alienable and Disposable Lands covering about 17%.

Table 6. Coastal Barangays of San Teodoro

SAN TEODORO	Area (ha)
Ilag	641.65
Lumangbayan	583.39
Poblacion	72.43
Tacligan	1526.53
TOTAL	**2824.00**

Source: Forest Land-Use Plan of San Teodoro, Oriental Mindoro, 2021

Municipality of Baco

The municipality of Baco spans across an approximate area of 31,126 ha. A total of four (4) out of 27 coastal barangays can be found within its jurisdiction constituting about 3.22% of the city's total area *(Table 7)*.

Majority of the barangays in Baco are in its elevation category ranging at more than 1,000 meters above sea level (masl). About 33.24% land portion of Baco has slopes greater than 50% due to its rough and rugged mountainous parts brought about by the structure of Mt. Halcon. This is followed by the lowland slope areas (about 0-8%) comprising approximately 27.10% of the municipality.

Table 7. Coastal Barangays of Baco

BACO	Area (ha)
Pambisan	142.47
Pulang-Tubig	80.20
Water	549.39
San Andres	229.28
TOTAL	**1001.34**

Source: Forest Land-Use Plan of Baco, Oriental Mindoro, 2019

Municipality of Calapan City

The city of Calapan spans across an approximate area of 18,676 ha. A total of 18 out of 62 coastal barangays can be found within its jurisdiction constituting about 8.47% of the city's total area *(Table 9)*.

Calapan City possesses wide plains having meandering rivers interspersed with wetlands at the seacoast periphery. The pervasive flat terrain is interrupted only by the elongated Bulusan Hill – the highest elevation in the city at about 187 meters above sea level.

Table 8. Coastal Barangays of Calapan City

CALAPAN CITY	Area (ha)
Balite	197.65
Calero	12.37
Gutad	904.70
Ibaba East	8.67
Ibaba West	69.02
Lazareto	130.12
Mahal na Pangalan	122.05
Maidlang	123.77
Nag-Iba I	19.95
Navotas	374.56
Pachoca	132.61
Parang	432.75
San Rafael (Salong)	82.92
San Antonio	13.00
Silonay	37.84
Suqui	179.58
Tibag	26.34
Wawa	35.80
TOTAL	**1,581.17**

Source: Forest Land-Use Plan of Calapan City, Oriental Mindoro, 2019

Municipality of Naujan

The municipality of Naujan spans across an approximate area of 52,804.15 ha. A total of 11 out of 70 coastal barangays can be found within its jurisdiction constituting about 10.32% of the municipality's total area *(Table 9)*.

Based on the municipality's FLUP recorded for 2021-2030, Naujan possesses the largest percent coverage of agricultural areas dominating the overall vegetative cover with an area of 13, 258 ha. This is followed by grassland and shrub (8,496 ha) and wetland areas (1,1,283 ha). Moreover, it was also recorded that Naujan has a total of 11 soil types whereas beach sand covers approximately 576.78 ha (1.09% of total area).

Table 9. Coastal Barangays of Naujan

NAUJAN	Area (ha)
Estrella	167.99
Herrera	350.93
Kalinisan	509.11
Masaguing	820.09
Melgar A	399.93
Melgar B	705.25
Montemayor	1541.51
Nag-Iba I	546.31
San Antonio	171.7
San Jose	67.67
Sta. Cruz	167.88
TOTAL	**5,448.37**

Source: Forest Land-Use Plan of Naujan, Oriental Mindoro, 2021

Municipality of Pola

The municipality of Pola spans across an approximate area of 16,032.68 ha. A total of 11 out of 23 coastal barangays can be found within its jurisdiction constituting about 35.93% of the municipality's total area *(Table 10)*.

The second smallest municipality in Oriental Mindoro, Pola is a small and mountainous municipality which lies along the eastern portion of the province known for its lush greenery. Its topography varies from flat alluvial plains, rolling hinterlands, hills and mountainous peaks. About 37.64% of the municipality between over 0-3% slope level that make up the largest portion of the land.

Table 10. Coastal Barangays of Pola

POLA	Area (ha)
Buhay na Tubig	1004.45
Bacawan	873.28
Tagumpay	505.56
Calima	1040.55
Misong	761.29
Puting Cacao	611.96
Tiguihan	320.87
Batuhan	351.54
Bayanan	284.17
Zone I	2.86
Zone II	3.5
Buhay na Tubig	1004.45
TOTAL	5,706.02

Source: Forest Land-Use Plan of Pola, Oriental Mindoro, 2019

Unfortunately, substantial decline in forest cover have been experienced by Pola over the past decades. Most probable causes for these include illegal logging and conversion of forests for agricultural uses. With these declines, current data on Forest and Forest Land Assets

from DENR records show that Pola has an approximate of 5,555 ha of timberland (34%) and 10,671 ha of Alienable and Disposable (A&D) Lands that are predominantly agricultural (66%).

Municipality of Pinamalayan

The municipality of Pinamalayan spans across an approximate area of 23,766 ha. A total of ten (10) out of 37 coastal barangays can be found within its jurisdiction constituting about 17.25% of the municipality's total area *(Table 11)*.

Pinamalayan consists of flat lands to highly steep mountainous lands. A large portion of Pinamalayan is classified under Alienable and Disposable for about 65.20% of its total area. On the other hand, forestlands comprise about 34.80% of the land area at 8,271.62 ha including upland forests, communal forests and the Mangyan Reservation Area.

Table 11. Coastal Barangays of Pinamalayan

PINAMALAYAN	Area (ha)
Banilad	690.11
Guinhawa	824.01
Lumangbayan	282.25
Papandayan	524.66
Pili	735.21
Zone I	41.35
Marfrancisco	225.10
Quinabigan	350.65
Ranzo	396.87
Wawa	30.39
TOTAL	**4,100.60**

Source: Forest Land-Use Plan of Pinamalayan, Oriental Mindoro, 2018

Municipality of Gloria

The municipality of Gloria spans across an approximate area of 28,029 ha. A total of eight (8) out of 27 coastal barangays can be found within its jurisdiction constituting about 8.99% of the municipality's total area *(Table 12)*.

Major portion of Gloria generally comprises of plain areas that extends from the southwestern part towards the western boundary separating Oriental and Occidental Mindoro. More than half of the municipality resides below 18% slope (55.20%), proving Gloria substantial for agricultural purposes.

Table 12. Coastal Barangays of Gloria

GLORIA	Area (ha)
Agsalin	248.76
Maragooc	403.75
Guimbonan	210.35
Sta. Theresa	303.80
Balete	499.35
San Antonio	292.93
Kawit	341.30
Tambong	220.10
TOTAL	**2520.34**

Hydrological Features

Major River Systems

Based on the data from Oriental Mindoro Facts and Figures 2017 Edition, there are a total of 13 identified major watersheds in Oriental Mindoro. Out of these 13, eight (8) are located within the VIP municipalities.

Table 13. The eight (8) out of the 13 Watersheds of Oriental Mindoro located in the municipalities covering the Verde Island Passage (ICM Plan of Oriental Mindoro, 2019)

Watershed	Location specified within VIP areas of Oriental Mindoro	Classification	Area (ha)
Agsalin-Banus River Watershed	Gloria		
Amnay-Patrick River Watershed	Baco, San Teodoro	C	36,130
Baco Bucayao River Watershed	Baco, Calapan City	C	35,622
Balete River Watershed	Gloria	C	
Catuiran-Bucayao River Watershed	Calapan City, Naujan, Baco, San Teodoro	C	42,093
Mag-Asawang Tubig River Watershed	Naujan	A	43,534
Pagbahan River Watershed	San Teodoro, Puerto Galera	C	28,500
Pula River Watershed	Pinamalayan, Gloria	C	24,217

Among these eight (8) watersheds, the Mag-Asawang Tubig River Watershed located in the municipalities of Naujan, Victoria and a portion of Occidental Mindoro is the only identified Class A (Public Water Supply Class II) referring to its water quality classification as a source of water supply. Still, this will require water treatment in order to meet the National Standards for Drinking Water (NSDW) of the Philippines. The Agslain-Banus River Watershed possess no classification as per reference used. Furthermore, the rest of the watersheds are classified as C which are deemed suitable for recreation, industrial supply and fisheries for propagation and growth of fish and other aquatic resources.

Ecosystem and Habitat

The three major coastal / shallow-water ecosystems in the tropics were identified referenced from the Integrated Coastal Management (ICM) Plan of Oriental Mindoro. These ecosystems include the mangroves, seagrass and coral reefs. As of 2018, a total of approximately 2,392 ha of mangroves, 4,537 ha of corals and 1,196 ha of seagrass are recorded in Oriental Mindoro. Although with the lowest record on mangroves, the municipality of Puerto Galera contains the largest cover of coral reefs among the eight (8) administrations.

Table 14. Estimated Total Area of Protected Mangrove, Seagrass and Coral Reef Habitats per Municipality according to the ICM Plan of Oriental Mindoro as of 2018

Municipality Estimated Area (ha)	**Puerto Galera**	**San Teodoro**	**Baco**	**Calapan City**	**Naujan**	**Pola**	**Pinamalayan**	**Gloria**	**TOTAL**
Mangrove	6	175	210	618	298	405	38	21	2,392
Corals	1,000	300	12	120	220	325	250	380	4,537
Seagrass	250	50	30	15	82	94	32	150	1,196

Important Flora and Fauna

Table 15. Mangrove species recorded in the province of Oriental Mindoro (State of the Coasts of Oriental Mindoro, 2019)

Family	**Species**	**Common Name**	**Family**	**Species**	**Common Name**
Acanthaceae (type genus: *Acantha*)	*A. ilicifolius*	lagiwliw	Rhizoporaceae (type genus: *Rhizopora*)	*R. apiculata*	bakhaw lalaki
	A. volubilis	lagiwliw		*R. mucronata*	bakhaw babae
Avicenniaceae (type genus: *Avicennia*	*A. alba*	bongalon / piapi / miapi / pipisik		*Bruguiera cylindrical*	pototan / busain
	A. marina	bayabasin / pipisik		*B. gymnorrhiza*	pototan / busain / langarai
	A. officinalis	pipisik		*B. sexangula*	pototan
	A. rhumpiana	bungalon		*B. parviflora*	langarai
Myrsinaceae	*Aegiceras corniculatum*	saging-saging		*Ceriops decandra*	baras-baras
	A. floridium	lala-o / saging-saging / tinduk-tindukan		*C. tagal*	tungog / tangal
Pteridaceae	*Acrostichum aureum*	palaypay	Arecaceae	*Nypa fruticans*	nipa / sasa

Euphorbiaceae	*Excoecaria agallocha*	lipata / alipata / buta-buta	Myrtaceae	*Osbornia octodonta*	tawalis / bunot-bunot
Sterculiaceae	*Heritiera littoralis*	dungon	Sonneratiaceae	*S. alba*	pagatpat
Combretaceae	*Lumnitzera littorea*	sagasa	Myliaceae	*Xylocarpus granatum*	tabigi
	L. racemosa	tabao / culasi		*X. moluccensis*	piag-ao

Table 16. Major marine species of Oriental Mindoro by volume (Provincial Agricultural Office Oriental Mindoro, 2016)

VOLUME OF MAJOR MARINE SPECIES (in metric tons)	2013	2014	2015	2016
Anchovies	547.11	600.65	666.85	503.07
Big-eyed scad	330.64	328.20	286.64	283.67
Bluecrab	37.96	34.39	30.34	23.06
Cavalla	158.25	144.06	119.01	118.45
Trevalle	105.93	110.57	46.63	39.39
Eastern little tuna	36.06	40.42	68.29	123.35
Fimbriated sardines	377.07	417.92	507.17	568.24
Frigate tuna	1,237.07	1,267.10	1156.19	1286.12
Grouper	90.68	85.40	63.17	36.82
Indian mackerel	653.31	688.94	700.31	589.48
Indian sardines	918.96	990.26	1134.34	1223.55
Indo pacific mackerel	141.11	142.01	141.25	137.25
Roundscad	1,536.13	1,579.90	1655.67	1153.06
Siganid	34.12	36.61	32.56	35.33
Skipjack	748.48	767.54	667.31	545.18
Slipmouth	427.37	471.95	442.75	325.52
Snapper	80.03	79.06	69.09	40.51
Spanish mackerel	71.54	64.33	50.08	35.05
Squid	462.85	519.95	489.38	476.39
Threadfin bream	412.69	414.63	337.55	266.30
Yellowfin tuna	577.51	624.12	443.77	312.97

Fishing is one of, if not the most, prevalent source of food and livelihood in the province of Oriental Mindoro. The residents of the province are greatly aware of the marine resources that are obtained especially along the Verde Island Passage and Tablas Strait. Among major fish species commonly caught by fisherfolks include *tanigue, tambakol, malasugi, mamsa,*

lapu-lapu, galunngong, Don Pilas, kalapato, samaral, dalagang-bukid, alumahan, bisugo and several other species of tuna. Based on the four-year (4) marine fish catch from 2013 to 2016 obtained from PAgO (*Table 17*), the frigate tuna (*alagaduwa*) was recorded to be the most abundant in terms of catch, followed by Indian sardines (species of *tamban*) then round scads (*galunggong*).

Table 17. Major inland species of Oriental Mindoro by volume (Provincial Agricultural Office Oriental Mindoro, 2016)

VOLUME OF MAJOR INLAND SPECIES (in metric tons)	2013	2014	2015	2016
Ayungin	36.76	35.95	35.03	37.18
Freshwater goby	20.60	16.92	18.22	22.01
Carpa	60.05	59.72	60.59	76.59
Dalag	33.42	31.51	34.49	31.13
Gourami	40.10	38.48	26.7	1.52
Freshwater hito	6.65	5.90	4	3.63
Freshwater eel	na/a	n/a	n/a	2.54
Tilapia	336.30	332.08	327.76	325.31

Among inland freshwater species of fish caught in Oriental Mindoro, *tilapia* remains the most abundant among the list, followed by carps and mudfishes. Moreover, aquaculture plays an important role in the province's fish production. Milkfish (*bangus*), tilapia and tiger prawn are among the top three (3) major cultured species in Oriental Mindoro.

Table 18. Major aquaculture species of Oriental Mindoro by volume (Provincial Agricultural Office Oriental Mindoro, 2016)

VOLUME OF MAJOR AQUACULTURE SPECIES (in metric tons)	2013	2014	2015	2016
Carp	0.01	0.01	>0.01	> 0.01
Catfish	0.02	0.02	0.01	> 0.01
Grouper	n/a	n/a	0.77	n/a
Milkfish	1,684.93	1,475.38	1,688.18	1,571.74
Mudcrab	0.98	0.66	0.21	0.15
Seaweed	281.42	277.91	112.49	41.75
tiger prawn	313.72	177.74	459.63	225.07
Tilapia	625.07	610.82	238.29	134.53

SOCIO-CULTURAL FEATURES

Social Services

a. Health

A total of six (6) public and 12 private hospitals are established in the province as of 2015 ranging from Levels I-III categories (PDPFP - Oriental Mindoro, 2016-25). The Level III hospital is located in Calapan City while Level II (one government and three private hospitals) are distributed from the northern to the southern parts of the province. A total of 249 Level I hospitals comprising of 17 Rural Health Units (RHUs) and 232 Barangay Health Stations (BHS) are recorded in the province that provide medical services that take over the gaps between and within health facilities.

According to PPDO of Oriental Mindoro, Inter Local Health Zones (ILHZ) are also distributed across the province comprising of the North, Central and South ILHZ wherein each possess a core referral hospital. Although all ILHZ hospitals have available and accessible PhilHealth Wards, only the North ILHZ meets the standard bed to population ratio of 1:1,000 by the DOH. Moreover, concerns regarding the current hospital set-up as of today revolve around the relative inaccessibility of central and southern municipalities for specialist services provided by the Level III hospital due to long travel time to reach Calapan City.

b. Education

The records obtained by the PPDO of Oriental Mindoro from the Commission on Higher Education (CHED) show that a total of 1,210 registered public and private schools for all levels of education are present in the province as of 2015. Public schools outnumber private-owned ones which provides more accessibility to basic education on pre-school, elementary, secondary and tertiary levels.

Transportation Services

a. Land Transportation

Tricycle and jeepneys are the primary mode of land transportation within the province of Oriental Mindoro, with several buses, jeeps and shuttle vans that are offered on a regular trip to travel between municipalities. The Strong Republic Nautical Highway (SRNH) is a road network of 919 kilometers of Manila-Iligan via Dapitan runs along mainland Luzon, Oriental Mindoro, Panay, Negros and Mindanao that provides opportunity for the province to interconnect with the major islands of the country via Roll- on- Roll- off (RORO) and fast crafts (MIMAROPA-NEDA, 2023).

b. Sea Transportation

In terms of sea travel, the Calapan and Roxas Ports are the two (2) major seaports in the Province. The Calapan Port widely offers both cargo and passenger services to Metro Manila and other provinces of Luzon and a few in Visayas – a total of 32 daily round trips. This port is equipped with docking areas for fast-craft, conventional and roll-on roll-off (RoRo) vessels for passenger trips. Other government ports are also located in Pola, Bulalacao and Mansalay and two (2) in Puerto Galera.

c. Air Transportation

For air travel, three (3) airports have been established in Oriental Mindoro but are currently non-operational. The Calapan Airport presently serves as a training ground for flying schools and general aviation that charter private individuals, government officials and investors. The other remaining airports in Pinamalayan and Wasig, Mansalay have also been non-operational except during emergency situations. Thus, travelling to and from the province of Oriental Mindoro heavily relies on sea transportation.

Religion

Oriental Mindoro predominantly comprises of religion under Christianity sectors such as Roman Catholics (~85%), *Iglesia ni Cristo* (INC) (~9%) and Protestant Groups (~7%). On the other hand, the religion of indigenous Mangyan population mainly falls under animism. This religion encompasses a collection of cultural practices attributed to beliefs of spirits and supernatural entities guided by nature.

Language

Albeit greatly influenced by native Visayan and several Mangyan dialects, Tagalog remains as the principal language in Oriental Mindoro. English is also widely spoken in the province especially along urban areas. Other languages prominent in the province include Ilokano, Cebuano and Hiligaynon, along with several Mangyan dialects such as Arayan, Buhid, Hanunoo, and Tadyawan.

Prepared by:

NEIL EDGAR DEX P. MARZA
Coastal Extension Officer

Noted by:

AMOR D. ASI
SVEMS / Chief, Conservation and Development Section

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Noted by:

AMOR D. ASI
SVEMS / Chief, Conservation
and Development Section

PASA Form No. 2
PROTECTED AREA SUITABILITY ASSESSMENT (PASA)
(KEY INFORMANT INTERVIEWS)

Name of Proposed Area (PA) : _____
Name of Interviewees: : Municipal and Barangay LGUs and POs of Oriental Mindoro
Address : Province of ORIENTAL MINDORO
Date of Interviews : February 2023; May 2023 – June 2023

I. Natural Features

A. Geological Features

Based on the KII's, the generally identified bodies of water within the proposed Protected Area include rivers, estuaries and seas On the other hand, common land forms that are found within their coastal areas include beaches, islands, cliffs and caves.

Generally Observed Features	
Land Forms	**Water Bodies**
Beaches	Seas
Sand Bars	Estuaries
Cliffs (Pola and Naujan)	Rivers
Islands / Islets (prevalent in Puerto Galera)	Waterfalls (Puerto Galera, Pola)
Cave	Bays
Rock Formations	Coves (Pola, Pinamalayan)

B. Importance and Uses

The importance of these identified geological features include the following:

- fishing for food and livelihood
- ecotourism
- breeding and nesting grounds for traversal, migratory and resident marine species
- docking / berthing area for fishing and passenger boats
- sites for carbon dioxide absorpotion / sequestration
- research purposes

C. Threats

The current and most prevalent threat identified by all of the informants was the oil spill incident caused by the sinking of MT Princess Empress Vessel last February 28, 2023. This led to the Oriental Mindoro under state of calamity declared on March 21, 2023. This state of calamity has banned all coastal activities such as fishing and recreation. The coastal barangays

in the municipalities of Pola and Naujan were the most affected rendering the coastal areas almost uninhabitable due to extreme water and air pollution. Fortunately, no locally managed Marine Protected Areas (MPAs) in the municipalities were affected by the spread of oil. Overall, this incident has put the fishery production and tourism services on Oriental Mindoro on halt until the month of June 2023, greatly reducing the economy of the municipalities for the current year. Other general threats include the following:

- solid waste management concerns (absence of sanitary landfills, improper waste disposals, sewage control)
- overflowing watershed systems
- overfishing
- illegal fishing practices
- improper delineation and demarcation of municipal boundaries that put fisherfolk councils between and within each municipality in disagreement
- algal blooms prevalent during summer seasons
- soil erosion brought about by mining and quarry
- natural calamities and onslaughts from climate change

Moreover, some specific concerns were raised by key informants hailing from certain coastal barangays. These include:

- the issues with reclamation of areas that are being converted into ports, rapidly decreasing the mangrove areas from little to none (Brgy. San Antonio, Calapan City)
- incomplete implemented projects on seawall / protection dike construction in certain barangays that still leave the areas vulnerable from storm surges (Brgys. Wawa, Zone I and Zone II, Pinamalayan; coastal barangays of Gloria)
- overfishing brought about by commercial fishing conducted by fisherfolks outside the province of Oriental Mindoro (coastal barangays of Calapan City;
- failure in maintaining mangrove plantations (coastal barangays of Baco, Calapan City, Naujan, Pola, Pinamalayan and Gloria)

D. Interventions of Threats

Addressing these identified concerns, the key informants identified the following interventions / actions conducted by the corresponding barangay resident and officials along with corresponding agencies who provided assistance in tackling these issues. These include:

- Regular coastal and river clean-ups
- Conduct of IEC on threats and issues of marine biodiversity and collaborative solutions in addressing these problems
- Mangrove / Tree planting
- Proper coordination between barangay, municipal and provincial LGUs regarding implementation of projects along the coastal areas
- Issuance of municipal ordinances that regulate fishing practices
- Provision of alternative livelihoods for coastal residents to mitigate overfishing
- Establishment and maintenance of Marine Protected Areas (MPAs)
- Publication of several management plans for the coastal areas (i.e., Solid Waste Management Plans, Integrated Coastal Management Plan, Forest Land-Use Plans)
- Strict law enforcement on proper consumption of marine resources such as hiring of *Bantay-Dagat* officials to overseer fishing and other coastal activities

II. Biological Features

A. Flora

IDENTIFIED FLORA	IMPORTANCE
Seagrass (lusay - *Cymodocea* spp., *Halodule* spp. etc)	- feeding and resting grounds of marine turtles and nesting sites of coral reef fishes - ecotourism sites
Mangrove species such as bayabasin, piapi, bacawan, bungalon, pipisik, palaypay, nipa, tabige and langarai)	- nesting sites for coral reef and traversal fishes - protection against natural disasters - ecotourism sites
Seaweeds	- cultured as source of livelihood
Beach Forest species (acacia, coconut, aroma and talisay)	- nesting sites of marine turtles - recreation spots - source of food and livelihood
Non-coastal fruit trees nearby coastal residences (mangoes, lanzones, santol, avocado,)	- source of food and livelihood

B. Fauna

IDENTIFIED FAUNA	IMPORTANCE
Marine Turtles	- maintenance and control of marine ecosystem populations along seagrass, coral reefs and mangrove ecosystems - tourist attraction
Coral Reefs	- habitat of fishes - regulation against water currents during stormy seasons
Reef fishes illegal for trade and consumption (parrotfishes, butterflyfishes, clownfishes, lionfish, scorpionfish, porcupinefishes, sharks, moray eels, barracuda)	- maintenance and protection of coral reef and sea grass ecosystems
Reef fishes for food source (*lapu-lapu*, sweetlips, groupers, trouts)	- source of food and livelihood
Migratory wildlife (dolphins, *sea cows*,	
Marine Invertebrates (echinoderms such as sea urchins and sea cucumbers; crustaceans such as crabs, shrimps and lobsters;	- some as source of food - regulation and maintenance of marine coastal ecosystems
Water Birds (egrets, birds-of-prey, wild ducks)	- regulation and maintenance of marine coastal ecosystems - tourist attractions

C. Nesting and Breeding Grounds

SITES	LOCATIONS IDENTIFIED
Breeding Sites	- prevalent across coastal barangays of Puerto Galera (all 12 barangays), Gloria (Brgys. Agsalin, Tambong, Sta. Theresa) and Pinamalayan (Brgys. Pili, Quinabigan, Ranzo) - seagrass sites of Brgy. Calero and Salong, Calapan City - mangrove areas of Naujan along Tujod Fish Sanctuary
Nesting Sites	- prevalent across coastal barangays of Puerto Galera (all 12 barangays), Gloria (Brgys. Agsalin, Tambong, Sta. Theresa) and Pinamalayan (Brgys. Pili, Quinabigan, Ranzo) - mangrove areas of Baco MPA - seagrass sites of San Teodoro (Brgy. Ilag and Tacligan) and Puerto Galera (Brgys. San Antonio, Aninuan and Balatero)

THREATS	INTERVENTIONS
Informal settlers along coasal areas disturbing the breeding and nesting grounds	- ensuring of stricter law enforcement - relocation of informal settlers - provision of alternative livelihood
Presence of stray domesticated animals such as dogs and cats that greatly disturb the marine turtle nesting sites	- ensuring of stricter law enforcement - enforcement of law on proper pet maintenance
Illegal hunting / poaching of eggs	- implementing reward systems in exchange for surrendering marine turtle eggs to the local municipality offices - proper IEC on marine turtles and their importance - installation of signages prohibiting such illegal activities

III. Socio-Cultural Features

A. Local Communities, Practices and Livelihood

The key informants from the municipal LGUs also identified areas / barangays with prevalent local communities residing on or nearby coastal areas. The most populated coastal areas identified by the informants include the following:

MUNICIPALITY	Identified coastal barangays with significantly populated areas
PUERTO GALERA	San Antonio, Dulangan, Aninuan, Sinandigan, Sto. Niño
SAN TEODORO	Lumangbayan, Poblacion, Tacligan
BACO	Pambisan, Water, Pulang-Tubig
CALAPAN CITY	Ibaba East, Ibaba West, San Antonion, Calero, San Rafael (Salong), Balite
NAUJAN	Estrella, Melgar A, Melgar B, Montemayor, Herrera
POLA	Misong, Tagumpay, Zone I, Zone II, Bayanan, Batuhan
PINAMALAYAN	Zone I, Pili, Papandayan
GLORIA	Balite, San Antonio, Maragooc

Traditional Practices	Source of Livelihood
Fishing	fishing (ranging from commercial to small-scale)
Farming	transportation services (tricycle and jeepney drivers)
Livestock and Poultry	plant produce (i.e., rice, vegetable crops, fruits)
Kaingin and Swidden Farming (prevalently practiced among Mangyan tribes)	

B. Threats of Proposed Protected Area to Local Communities

To summarize the general threats of the proposed Protected Area for legislation under ENIPAS to local communities from interviewed informants mainly concern about the limiting of marine resources. As experienced by most informants having a background on fishing, there is an alleged period of adjustment once their locally managed MPAs were declared that include a series of protests and disagreements between municipal / barangay officials and residents. These limits include:

- limited space for docking / berthing of boats
- fear of stricter fishing regulations that may reduce livelihood and income
- disagreements concerning establishment and demarcation of multiple-use and strict-protection zones
- relocation of illegal settlers without proper alternatives to livelihood and economy

C. Issues and Concerns Encountered

The current primary issue raised by all key informants of Oriental Mindoro for the VIP PASA generally revolve around the oil spill incident. This had greatly damaged their coastal environments as well as their source of food and income that alternative livelihoods such as the programs implemented from the Cash-For-Work Program was necessary yet only temporary. Specifically, other concerns include:

- practice of illegal fishing (use of illegal nets; *muro-ami*, cyanide and dynamite fishing)
- solid waste management concerns
- inadequate river systems that mitigate floods
- illegal settlers
- public threats brought about by insurgency

IV. Economic Development Features

KEY INFORMANT	**RESPONSE**
Municipal LGUs	➢ Regular (Monthly) Coastal Clean-Ups ➢ Construction of Seawall ➢ Proper IEC on Coastal Environment conservation, management and protection ➢ Reward system in exchange of surrendering marine turtle egg sightings along coastal areas
Provincial LGUs	➢ Proposed construction of bridge that connects Batangas and Mindoro Provinces
Barangay LGUs	➢ Agreement with Philippine Port Authority (PPA) on regulation of reclamation projects within the coastal areas (Brgy. San Antonio, Calapan City) ➢ Yearly conduct of species inventory on locally managed MPAs (Brgy. Agsalin, Gloria)