



Department of Environment and Natural Resources
Manila Bay Site Coordinating/Management Office 4

The ABCS of Manila Bay Rehabilitation Program

Region IV-A (CALABARZON)



THE ABCs OF MANILA BAY REHABILITATION PROGRAM REGION IV-A CALABARZON

On December 18, 2008, the Supreme Court issued a decision under G.R. No. 171947-48, ordering the 13 Mandamus Agencies to clean-up, rehabilitate and preserve Manila Bay in its own capacities.

The DENR, as the lead agency, together with the Mandamus Agencies are mandated to implement the Operational Plan for the Manila Bay Coastal Strategy (OPMBCS) C.Y. 2017-2022.

The OPMBCS focuses on five (5) areas of concerns such as liquid waste management, solid waste management, informal settlers, habitat and resource management, and Institutional Arrangement/Partnership Governance.

The said decision was further strengthened by virtue of a Supreme Court En Banc resolution dated February 11, 2011. The Manila Bay Coordinating Office (MBCO) was created under the DENR Administrative Order (DAO) No. 2011-01. The MBCO was directed to fully implement the OPMBCS in coordination with the mandamus/agencies and other cooperating agencies.





Manila Bay : Photo by Kairix Tozier G. Calvara

VISION

"Manila Bay-reflective of God's glory is a clean, safe, wholesome, and productive ecosystem, a center of socio-economic development, and a natural heritage nurtured by Filipino values towards a better quality of life for the present and future generations"

MISSION

To clean-up, rehabilitate, and preserve Manila Bay, and restore and maintain its water to SB level to make it fit for swimming, skin diving, and other forms of contact recreation

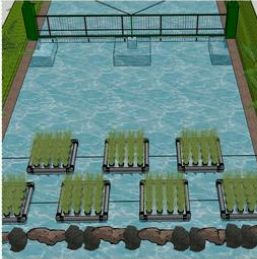


Manila Bay Site Coordinating/Management Office 4
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
REGION IV-A (CALABARZON)



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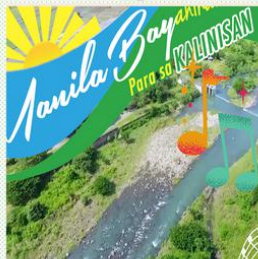
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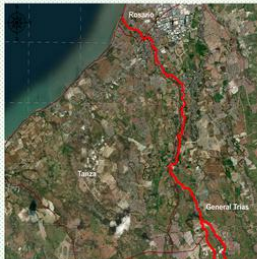
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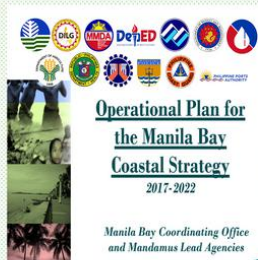
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Makakalikasang Pagbati!

The Department of Environment and Natural Resources IV-A (DENR-CALABARZON) recognized the **VISION** of the Manila Bay Coastal Strategies (MBCS) - *"Manila Bay-reflective of God's glory is a clean, safe, wholesome, and productive ecosystem, a center of socio-economic development, and a natural heritage nurtured by Filipino values towards a better quality of life for the present and future generations"*. Thus, we constantly ensure that the different plans, programs/projects and activities contained in the Operational Plan for the Manila Bay Coastal Strategies (OPMBCS) are timely implemented.

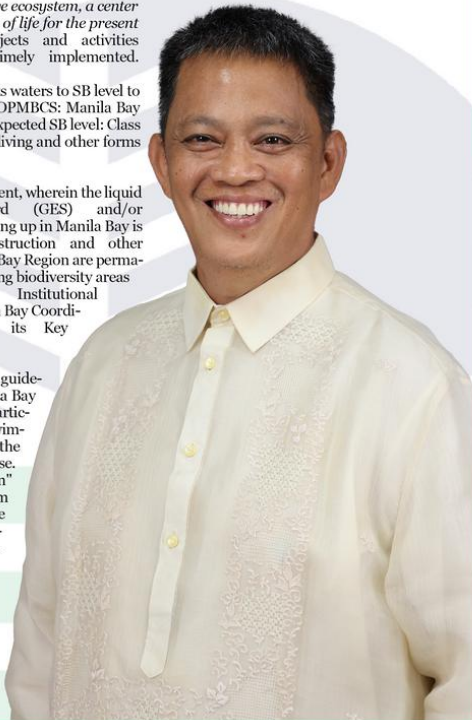
The **MISSION** of the MBCS - *"To clean up, rehabilitate, and preserve Manila Bay, and restore and maintain its waters to SB level to make it fit for swimming, skin diving, and other forms of contact recreation"* is translated to the goal of the OPMBCS: Manila Bay cleaned-up, rehabilitated, and preserved, and waters restored and maintained at SB level, and affirmed in the expected SB level: Class SB, per DENR Administrative Order No. 34, s.1990 is a classification of marine water fit for swimming, skin diving and other forms of contact recreation.

The five (5) target **OUTCOMES** per cluster of the OPMBCS are inspired as follows: 1) Liquid Waste Management, wherein the liquid waste discharging into Manila Bay is compliant with General Effluent Standard (GES) and/or ambient water quality with the water quality guidelines, 2) Solid Waste Management, wherein solid waste ending up in Manila Bay is reduced; 3) Informal Settler Families and Illegal Structures, wherein houses, structures, construction and other encroachments along easement areas in rivers, waterways, esteros, lake, bay, and coastlines within the Manila Bay Region are permanently removed, 4) Habitat and Resources Management, wherein soil loss in Manila Bay is reduced and existing biodiversity areas within Manila Bay Region are protected and conserved; and 5) Institutional Arrangement/Partnership and Governance, wherein the OPMBCS is properly implemented, entrusting Manila Bay Coordinating Office and Mandamus Lead Agencies to work hand in hand in accomplishing its Key Performance Indicators (KPIs).

The **ABCs of Manila Bay Rehabilitation Program Region IV-A (CALABARZON)** will serve as a guide-book in understanding how the different target outcomes are interpreted into different activities of the Manila Bay Site Coordinating/Management Office 4 (MBCSMO4). It tours us to appreciate the purpose of establishing a particular activity and how it is connected to one another to achieve one important goal of clean water suited for swimming and contact recreation. For example, water quality sampling is conducted to know the levels of toxicity of the water in a particular area, and thus we are alarmed that the water is not fitted for human use. Consequently, we need to take action in calling the attention of the polluters to "collect" their wastes and "clean" their spaces. At the micro level, the household was identified as the culprit for producing 57% of solid waste from 2008 to 2018 (DENR-National Solid Waste Management Status Report-EMB). So, if we would be practicing the 3Rs of Solid Waste Management, such as Reduce, Reuse, Recycle- through the establishment of Ecological Gardens, using container plastic and other recyclable containers, we can be sure that those garbage would not reach our bodies of water including rivers, esteros, Laguna de Bay and eventually the Manila Bay.

LET US WORK HARD BEYOND COMPLIANCE. Our small efforts count, like simple disposal of our garbage in its proper places, is well appreciated by our Mother Earth!

Nilo B. Tamoria
Nilo B. Tamoria, **CESO III**
Regional Executive Director
DENR REGION IV-A (CALABARZON)





Masaganang Pagbati!

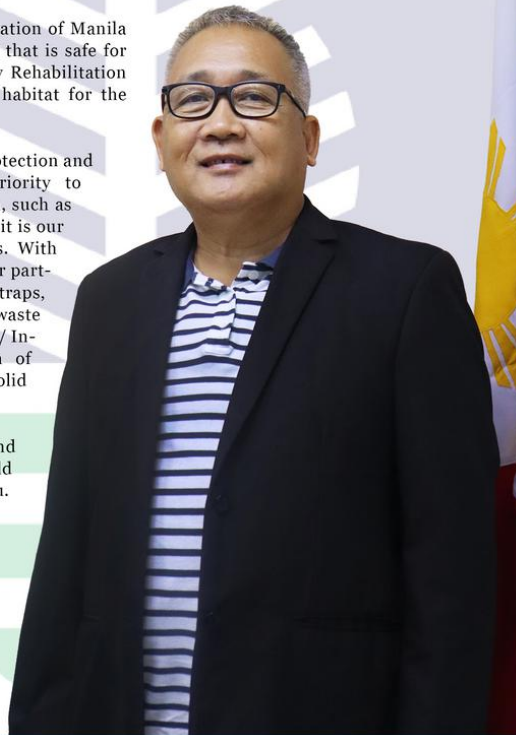
One of the DENR CALABARZON's top priorities is the rehabilitation and restoration of Manila Bay. It aims to improve and maintain Manila Bay's water quality to an SB level that is safe for human beings and suitable for recreational activities. Furthermore, Manila Bay Rehabilitation seeks to enhance socioeconomic development and create a more sustainable habitat for the Filipino people.

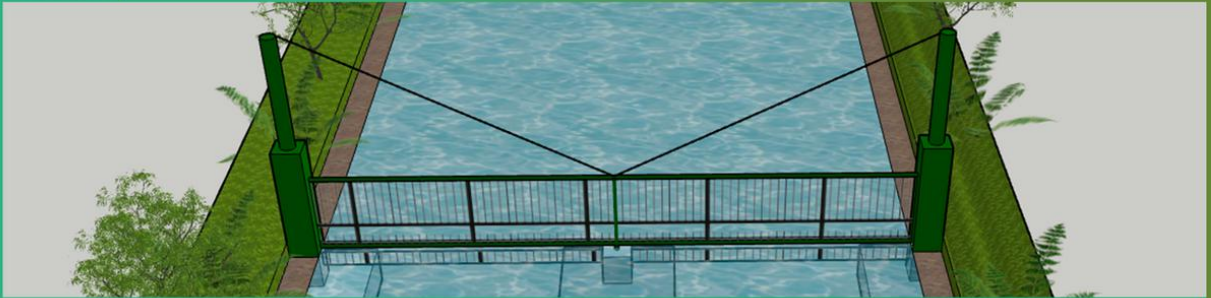
Aside from the Build Back Better projects such as those concerning watershed protection and rehabilitation, the Special Concerns Office also provides support and priority to government's environmental programs that require immediate and timely action, such as the Manila Bay Rehabilitation Program. Overseeing the Manila Bay Region area, it is our responsibility to prevent waste from leaking into the Manila Bay at all times. With concerted efforts and strategies, the DENR together with the Mandamus and other partner agencies devised some solutions such as installation and fabrication of trash traps, trash nets, biogas digesters, and composting facilities and equipment to address waste collection; and Massive Communication Education and Public Awareness (CEPA) / Information Education and Communication (IEC) campaign and distribution of CEPA/IEC materials among others; to promote the importance of liquid and solid waste management and encourage everyone to conduct regular clean-ups.

To all our partner agencies and organizations as well as volunteers who come and participate in our rehabilitation program - ***Maraming Salamat po!*** We would not be able to accomplish anything without partnering with you.
Congratulations and More Power!

A handwritten signature in black ink, appearing to read "Jose Elmer C. Rasco".

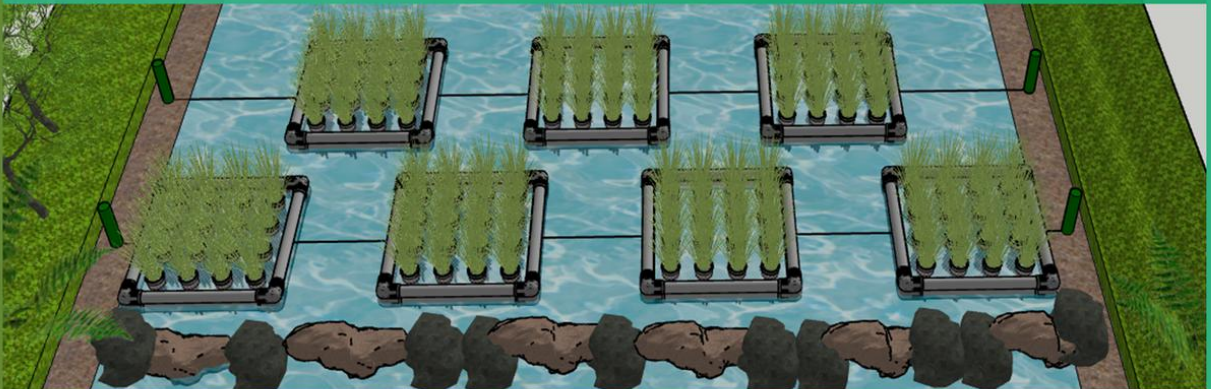
Jose Elmer C. Rasco
Assistant Regional Director for Technical Services and Special Concerns
DENR REGION IV-A (CALABARZON)





Aquatic Macrophyte Biosorption System (AMBS)

The Aquatic Macrophyte Biosorption System (AMBS) is a cost-effective water filtration system pioneered by Dr. Macrina T. Zafaralla of the University of the Philippines Los Baños (UPLB). The structures are installed across the stream or river and use water plants (water hyacinth or kangkong) to form a mat that filters out floating solids and absorbs substances dissolved in water.



Under the Liquid Waste Management Cluster of the Manila Bay Rehabilitation Plan, a total of five (5) structures were installed in the priority rivers of Batangas, Cavite, Laguna, and Rizal. Two (2) AMBS structures were installed in Boso-Boso River in the province of Rizal while one AMBS structure was installed each in San Juan River in Batangas, Labac River in Cavite, and Saran River in Laguna.

The system help to improve phytoremediation, increase fish stock and biodiversity of faunal species, and can decrease impurities in water which leading to a cleaner outflow down the river system draining to Manila Bay.





BIOGAS DIGESTER

A TECHNOLOGY TO RED



The Biogas Digester Technology (BDT) is an intervention under the Liquid Waste Management of the Manila Bay Rehabilitation Plan that is installed in the local livestock and poultry industry owners/raisers to practice proper waste management by treating manure as a renewable resource rather than liquid waste being discharged to a river system which eventually drains into Manila Bay.

Since animal manure is typically viewed as a waste rather than a resource, improper waste or manure management results in polluting water bodies. The biogas digester tends to provide a cost-effective solution by converting animal manure to renewable energy known as "biogas" (which can be burned to generate electricity and heat or processed into renewable natural gas and transportation fuels), and treating wastewater through anaerobic digestion to meet the General Effluent Standard Class C of DENR Administrative Order no. 2016-08 for safe and acceptable discharge.

To date, the DENR CALABARZON has already installed a total of thirty-eight (38) Biogas Digesters in the province of Cavite, particularly in the cities of Imus and Trece Martires and the municipalities of General Emilio Aguinaldo, Alfonso, Magallanes, Naic, Silang, and Tanza.

REDUCE WASTEWATER POLLUTION LOAD FROM BACKYARD LIVESTOCK AND POULTRY INDUSTRY

CLEAN-UP ACTIVITIES/SOLID WASTE COLLECTION THRU RIVER RANGERS, TRASH TRAPS AND TRASH NETS SITES



Under the Solid Waste Management Cluster of the Manila Bay Rehabilitation Program, the DENR CALABARZON has three (3) methods in collecting solid waste. Two of which are through the hired River Rangers (RR) and through the installed trash traps and trash nets.

WASTE COLLECTION OF RIVER RANGERS

PROVINCE	2020	2021	2022 as of October
CAVITE	590,704	480,497	2,180,191.25
BATANGAS	2,454,352	2,383,851	447,109.5
LAGUNA	1,342,635	1,105,365	1,106,026.8
RIZAL	737,593	1,106,922	644,440
TOTAL	5,125,284	5,076,634	4,377,767.55

WASTE COLLECTION OF TRASH TRAPS AND TRASH NETS (kg)

PROVINCE	2020	2021	2022 as of September
CAVITE	-	13,648.5	1,143,025.5
BATANGAS	8,972.3	8,972.3	26,747
LAGUNA	51,465	503,695	28,895
RIZAL	175,204.5	268,639.5	93,952
TOTAL	237,661.8	802,075.3	1,292,619.5



Labac River System
Brgy. Ibayo Silangan, Naic, Cavite
Trash Net

ECOLOGICAL GARDEN



To reduce wastes entering the Manila Bay, water bodies, and sanitary landfills, one of the major activities of the Manila Bay Site Coordinating/Management Office in the Regional and Field Offices is the establishment of ecological gardens or eco-gardens using composts and recyclable materials within selected barangays within the Manila Bay Area of Region IV-A for the improvement of the Solid Wastes Management (SWM) practices at the barangay level.

As of 2021, there are already 117 established eco-gardens under the MBSCMO4 and Field Offices: 26 in Cavite; 27 in Laguna; 35 in Batangas; and 29 in Rizal. These eco-gardens not only support our battle for a cleaner Manila Bay but also aid in the food security of each barangay/community that was granted this project as most of the participating barangays prioritize planting vegetable crops to share their produce with their communities. Additionally, the eco-gardens also improve the aesthetics of the barangays by converting recyclable materials like plastic bottles and used tires into colorful eco-planters or decorations for the eco-gardens.

PROVINCE	Number of Established Eco Garden			LOCATION
	2020	2021	2022	
CAVITE	16	10	5	Naic, Trece Martires City, Maragondon, Mendez, Magallanes, GEA, Alfonso, Amadeo, Silang, Kawit, Noveleta, GMA, Imus City, Rosario, Cavite City, Tanza, General Trias City, and Dasmariñas City
LAGUNA	8	19	10	Calamba City, Biñan City, San Pedro City, and Sta. Rosa City
BATANGAS	20	10	11	Tanauan City, Lipa City, Malvar, and Sto. Tomas City
RIZAL	14	15	11	Angono, Binangonan, Cardona, Morong, Teresa, Jala-jala, Pililla, Tanay, Baras, Antipolo City, Rodriguez, San Mateo, Cainta, and Taytay
TOTAL	58	54	37	149 Established Eco-gardens

To date, for CY 2022, more eco-gardens are expected to be established as the Manila Bay Field Offices in Cavite, Laguna, Batangas, and Rizal have targets of establishing at least 37 eco-gardens in different cities/municipalities.



Fabrication and Installation of Trash trap and Trash net

In view of the goal to reduce solid waste ending up in Manila Bay, one of the intervention of the DENR-MBSCMO4, through its provincial counterpart, is the fabrication and installation of trash traps and nets.

Manila Bay Site Coordinating/Management Office Region IV-A (MBSCMO IV-A), in coordination of MBSCMOs Batangas, Cavite, Laguna, and Rizal, has installed a total of 106 trash traps and 5 trash nets.

The fabrication and installation of geoenvironmental structures such as trash traps and trash nets is one of the interventions of DENR under the Solid Waste Management Cluster of the Manila Bay Rehabilitation Program to reduce solid waste ending up in Manila Bay.

Trash traps and trash nets aid in the screening of garbage waterways for easy and accessible waste collection. These structures are intended to capture litter before it flows further downstream by directing debris into the trap/net using the current. Together with the active participation of local government units, trash traps, and trash nets have played an essential role in the elimination of solid waste that drains into Manila Bay over the years.

Established Trash Trap/Trash Nets

	Trash Trap	Trash Nets
Cavite	49	5
Laguna	20	-
Batangas	13	-
Rizal	31	-
Total	113	5

The installed geotechnical structures are regularly monitored and subjected to repair in instances the units were damaged by natural hazard / calamity / human intervention / heavy load of solid waste.

Trash net
Barangay Salinas I, Bacoor City, Cavite
(Imus River)



Trash net
Zapote River
Brgy. Habay 1, Bacoor City, Cavite



Trash trap
Hinulugang Taktak River
Antipolo, Rizal

Fabrication of Composting Equipment/Facilities

These facilities were established in the different barangays/municipalities in the provinces of Cavite, Laguna and Rizal to enhance the proper solid waste management in the communities. Moreover, these facilities could serve as MRF and provide shelter for biogas digester and recyclable materials (i.e., plastic bottles, plastic wrappers, used tires, and cans) that could be made into products that are beneficial to the communities and barangays, instead of these materials going into rivers or landfills. Primarily, other composting materials such as manures are being processed in the composting facilities, for the production of compost for use of natural fertilizer.

To date, there are a total of four (4) existing composting facilities and eight (8) composting equipment such as Biodegradable and Non-biodegradable shredders, Plastic Pulverizer, and Biowaste shredder distributed in several Barangay Local Government Units (BLGUs) of Cavite, Laguna and Rizal.

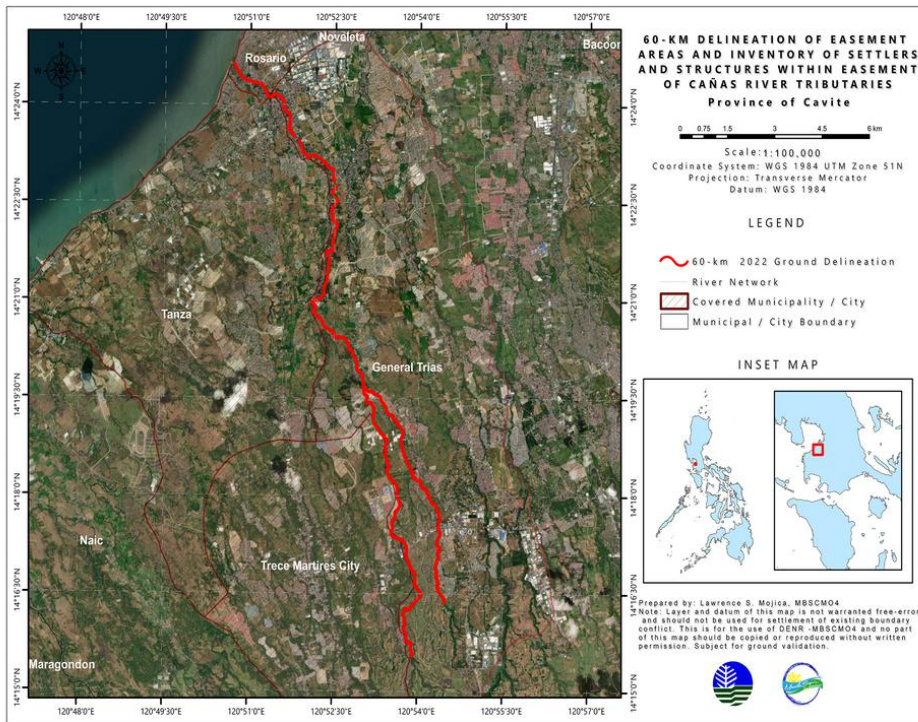




Ground Delineation of Easement Area and Inventory of Informal Settler Family

The rehabilitation of Manila Bay is one of the priority programs of DENR following the success story of Boracay Island. To pursue its rehabilitation, the Manila Bay Rehabilitation Program as spearheaded by the DENR was launched on January 27, 2019. To strengthen the commitments of the Mandamus Agencies and OGAS, NGOs, LGUS and private sectors, President Rodrigo Duterte issued Administrative Order No. 2019-16 on February 21, 2019, expediting the rehabilitation and restoration of the coastal and marine ecosystem of the Manila Bay and the creation of the Manila Bay Task Force. To support the implementation of the Manila Bay Rehabilitation Program, one of the identified activities of the DENR and other Mandamus Agencies is the clearing of easement of waterways draining to Manila Bay. Easements must be cleared primarily to free the space from any obstruction: facilitating free flow of water that are coming from the upstream to downstream. Consequently, any structure and their generated wastes (e.g., houses and industries and others that block the waterways are hindrance to the natural flow of water such as from the main rivers and its tributaries draining to Laguna lake, to Pasig River and eventually draining to Manila Bay, hence, delineation of easement is being undertaken by DENR.

For C.Y. 2020, in the province of Cavite, a 50km delineation of easement areas and inventory of settlements and structures within the easement of Imus River tributaries were conducted while for C.Y. 2021, a 90km ground delineation of legal easement of Imus and Ylang-Ylang River tributaries were undertaken.



90-KM DELINEATION OF EASEMENT AREAS AND INVENTORY OF SETTLEMENTS AND STRUCTURES WITHIN THE EASEMENTS OF YLANG-YLANG AND IMUS RIVER TRIBUTARIES
Province of Cavite



Scale: 1:120,000

Coordinate System: WGS 1984 UTM Zone 51N

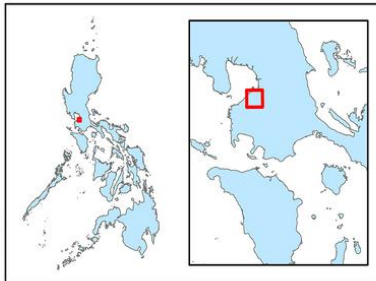
Projection: Transverse Mercator

Datum: WGS 1984

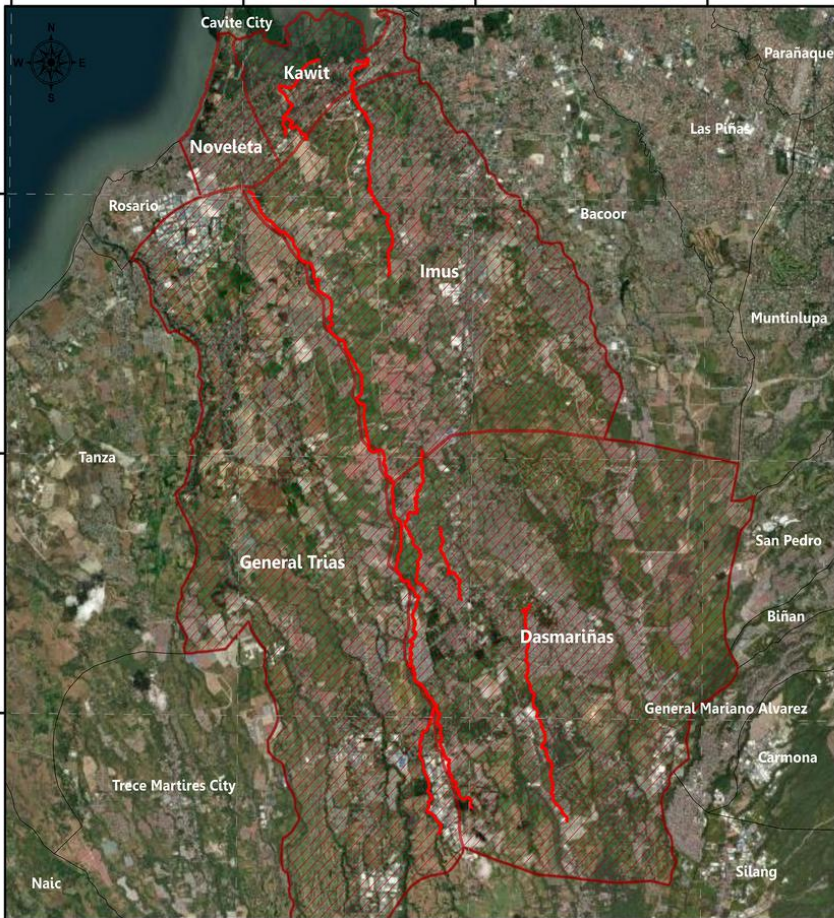
LEGEND

- 90-km 2021 Ground Delineation
- River Network
- Covered Municipality / City
- Municipal / City Boundary

INSET MAP



Prepared by: Lawrence S. Mojica, MBSCMO4
 Note: Layer and datum of this map is not warranted free-error and should not be used for settlement of existing boundary conflict. This is for the use of DENR -MBSCMO4 and no part of this map should be copied or reproduced without written permission. Subject for ground validation.



Hiring of River Rangers

CLEAN-UP ACTIVITY

Manila Bay Site Coordinating Office IV-A (MBSCMO IV-A), with the coordination of the MBSCMOs of Batangas, Cavite, Laguna, and Rizal, has continuously ensured that the rivers in the provinces are being cleaned.

Below are the 31 Major River Systems within Manila Bay Area in Region IV-A.

1. Maragondon River
2. San Cristobal River
3. Labac River
4. San Juan River
5. Molawin Creek
6. Cañas River
7. Rio Grande River - Ylang-Ylang River
8. Bay River
9. Imus River
10. Pila River
11. Sta. Cruz River
12. Zapote River
13. Pagsanjan River
14. San Pedro River
15. Pangil River
16. Biñan River
17. Siniloan River
18. Santa. Rosa River
19. Santa. Maria River
20. Cabuyao River
21. Tanay River
22. Angono River
23. Taytay River
24. Cainta River
25. Manggahan Floodway
26. Nangka River
27. Wawa River
28. Boso-Boso River
29. Montalban River
30. Tayabasan River
31. Sapang Bute River



The main source of heavy water pollution and poor water quality is solid waste flowing in rivers, coastal areas, and bodies of water. In order to address this issue, the conduct of clean-up activities through hired River Rangers is implemented. The hired River Rangers are conducting extensive clean-up in rivers in Batangas, Cavite, Laguna, and Rizal and coastal areas in the province of Cavite.

The conduct of clean-up activities through River Rangers is undeniably a massive help in eliminating the presence of solid waste in the rivers and coastal areas. However, the amount of solid waste collected during each River Rangers clean-up suggests that there is still a lot of work to be done. Continuous and harmonious coordination with mandamus agencies should be conducted for solid waste management implementation.

	NUMBER OF RIVER RANGERS HIRED			WASTE COLLECTION		
	2020	2021	2022 <small>as of october</small>	2020	2021	2022 <small>as of october</small>
BATANGAS	114	46	52	590,704	480,497	447,109.5
CAVITE	565	255	198	2,454,352	2,383,851	2,180,181.25
LAGUNA	248	163	84	1,342,635	1,105,365	1,106,026.8
RIZAL	145	67	90	737,593	1,106,922	644,440
TOTAL	1,072	531	424	5,125,284	5,076,634	4,377,767.55

Removal of Water Hyacinth

DENR IV-A (CALABARZON), through the mobilization of hired River Rangers and the direct administration of the field offices, MBSCMO – Laguna and Rizal, have been conducting daily collection and removal of water hyacinth as part of the interventions by the members of the Task Force Water Hyacinth to fully protect and maintain the beauty and the scenery of the Manila Bay. From August – December 2021, the DENR IV-A recorded a total of **4,253.41 tons** of collected water hyacinth along the rivers and lakeside areas, which were transported by the LGUs to their available disposal sites. This initiative not only protects the waters from eutrophication and reduction of dissolved oxygen and nutrients, but also alleviates navigation for water transportation and provides an additional livelihood for residents as handicraft makers and River Rangers.





Hiring of River Boats





The hiring of boats was implemented in order to effectively eliminate solid waste and improve the water quality in coastal areas in the province of Cavite. Ten (10) boats were hired monthly in the province; five (5) boats were hired in the city of Bacoor; four (4) in the municipality of Kawit; and one in the municipality of Noveleta. The hiring of boats aims to provide assistance to River Rangers during their daily clean-up activities and patrolling, specifically in the inaccessible areas due to high water levels. In addition, boats were hired to transport the hauled bamboo waste to designated Material Recovery Facilities (MRF) and Sanitary Landfill (SLF)



“Sana po panawagan sa ating lahat dito, magsamasama po tayo at wag po tayong magsawa sa pagtugon sa mga ganitong hamon dahil wala naman po tayong ibang maipamamana sa ating mga susunod na henerasyon kundi po ang sigla, lusog ng ating kapaligiran.”

Nilo B. Tamoria

Regional Executive Director

International Coastal Cleanup 2022

September 16, 2022

Barangay. Bucana Malaki, Naic, Cavite

The International Coastal Cleanup is a worldwide event that aims to remove discarded plastic and other harmful waste from oceans, rivers, and streams. By joining this movement, we can help protect the nature and coastlines while also building stronger communities. The coastal cleanup takes place on the third Saturday of September every year this year, IC Day took place on September 17, 2022 with the theme *“Fighting for Trash-Free-Seas Pilipinas! Ending the Flow of Trash at the Source”*.

**INTERNATIONAL COASTAL CLEANUP
AND OTHER CLEANUP ADVOCACY**

Cleanup and Advocacy

	VOLUME OF WASTES COLLECTED (kg)	TOTAL NUMBER OF VOLUNTEERS	TOTAL NUMBER OF CLEANUP ACTIVITIES CONDUCTED
2019	56,971	6,260	49
2020	27,683	1,871	15
2021	121,558.5	1,323	12
2022 as of September	22,303.20	1,446	14
TOTAL	228,515.7	10,900	90

The conduct of clean-up activities thru the mobilization of volunteers, aims to encourage the public to join the advocacy to rehabilitate the Manila Bay and the coastal areas of the region by regularly conducting cleanup activities and by exercising ecological solid waste management practices such as waste segregation-at-source, proper waste disposal, composting of biodegradable waste composting, and recycling. The said clean-up activities were largely attended extensively by locals/residents, local government units, mandamus agencies, private companies, and others.

LAUNCHING OF MANILA BAY PARA SA KALIKASAN

In June 2022, MBSCMO4 launched an Audio-Visual Presentation (AVP) on DENR IV-A CALABARZON's Facebook Page and Youtube channel.

The said song is a "cry for help" for the preservation and protection of the Manila Bay itself. It reflects the present condition of our rivers and of the Manila Bay, emphasizing the solid waste management issues and polluted quality of water in it. The song also talks about achieving the goal of a clean Manila Bay through the unity of all stakeholders towards solid and liquid waste management. The AVP

was posted on DENR CALABARZON social media account on June 29, 2022, with these links:

 <https://www.facebook.com/watch/?v=801027967931692>

 <https://www.youtube.com/watch?v=XJNBLJK3X00>



Manila Bayanihan

Para sa **KALINISA**

namasdan ang Kailugan



Manila Bay Para Sa Kalikasan

Composed by: For. Raymund F. Mercurio

Kung pagmamasdan ang kailugan
Ating makikita ang karumihan

Kung pagmamasdan, takbo ng oras
Kasabay ng pag-agos ng katubigan

Ano ang gagawin upang pangalagaan?
Ano ang gagawin bilang mamamayan?

Maghawak-hawak, magkapit-bisig
Manila Bay ating pangalagaan

Kung pagmamasdan ang karagatan
Ating makikita ang karumihan

Kung pagmamasdan, takbo ng basura
Kasabay rin ang hanging tinatangay

Ano ang gagawin upang pangalagaan?
Ano ang gagawin bilang mamamayan?

Maghawak-hawak, magkapit-bisig
Manila Bay para sa kalikasan



PERSONAL PROTECTIVE EQUIPMENT (PPE) DISTRIBUTED TO THE RIVER RANGERS

River Rangers, as one of the frontliners in guarding the rivers from solid waste, are prone to unforeseen accidents, metal hazards, and the threats of COVID-19. To avoid such accidents, the MBSCMOs in Batangas, Cavite, Laguna, and Rizal are providing Personal Protective Equipment (PPE) to the hired River Rangers for extra protection. As of July 2022, a total of four hundred twenty-two (422) PPEs were distributed to River Rangers in Batangas, Cavite, Laguna, and Rizal.



MBSCM OFFICES

No. of Distributed PPEs

Distributed PPEs to River Rangers

LAGUNA

50

Long sleeves, rubber boots, raincoats, hats, vitamins, alcohol, and face masks.

BATANGAS

198

Rake, shovel, rubber boots, rain coat, hat, long sleeves, Vitamin C, alcohol, and face masks

RIZAL

84

Long sleeves, rubber boots, raincoats, hats, vitamins, alcohol, and face masks.

CAVITE

90

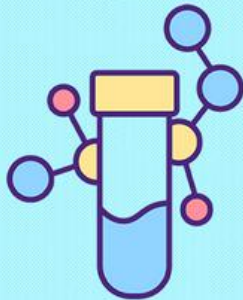
Long sleeves, rubber boots, raincoats, hats, vitamins, alcohol, and face masks.





Monitoring of Water Quality

The Water sampling is conducted to monitor the quality of water as a medium for better decision-making in implementing interventions and rehabilitation activities in the Manila Bay Area in Region IV-A. The primary parameters such as Bacteriological, Metal/Inorganic, and Physio-chemical were used in the water quality monitoring. Water sampling activities aim to assess how polluted the water is so that we can bring back the water quality of the Manila Bay to its SB level.

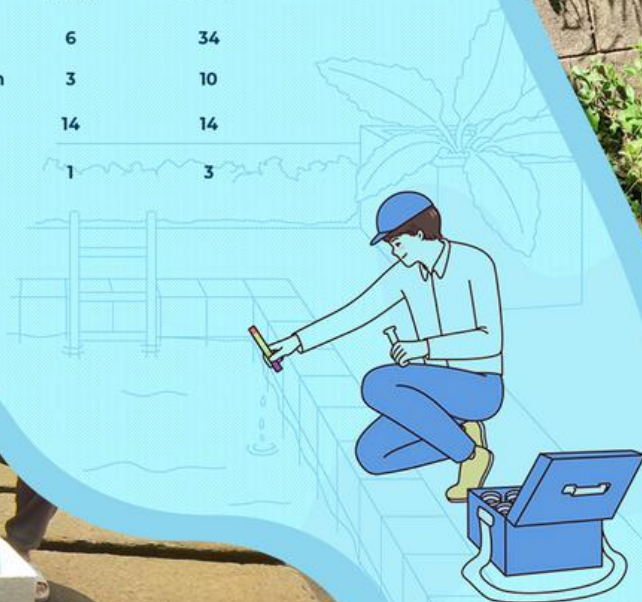


Targets of MBSCM Offices C.Y. 2022

PROVINCES	No. of River/s	No. of Sampling Station
BATANGAS	1	3
RIZAL	12	36
CAVITE	9	27

Targets of EMB 4A - C.Y. 2022

EMB 4A Targets	No. of River/ Beach	No. of Sampling Station
Rivers	6	34
Rivers Mouth	3	10
Bathing Beaches	14	14
Bacoor Bay	1	3



NECESSARY CONDUCT OF MONITORING AND SURVEILLANCE OF AQUACULTURE STRUCTURES ALONG THE MANILA BAY



RED Nilo Tamoria led the Manila Bay/Mandamus Inter-Agency Task Force-Cavite Cluster in the clearing of illegal aqua structures in Cavite Last November 2021. The DENR-PENRO Cavite thru its MBSCMO and Surveillance/Intelligence and Investigation Unit together with the representatives from the Philippine Coast Guard (PCG), Philippine National Police-Maritime Group (PNP-MG), Local Government Unit (LGU) of Cavite City conducted the surveillance and monitoring operation in the City Waters of Cavite City in support of Phase III Post Clearing Operation of Illegal Sapra Structures.





OPERATIONAL PLAN FOR THE MANILA BAY COASTAL STRATEGY (OPMBCS)

The OPMBCS is an action program and operational plan under the Supreme Court Mandamus G.R. No. 171947-48 issued on December 18, 2008, which mandated the thirteen (13) national government agencies composed of 1) Department of Environment and Natural Resources (DENR) as the lead agency, 2) Department of the Interior and Local Governance (DILG), 3) Department of Education (DepEd), 4) Department of Health (DOH), 5) Department of Agriculture (DA), 6) Department of Public Works and Highways (DPWH), 7) Department of Budget and Management (DBM), 8) Philippine Coast Guard (PCG), 9) Philippine National Police Maritime-Group (PNP-MG), 10) Philippine Ports Authority (PPA), 11) Metropolitan Manila Development Authority (MMDA), 12) Metropolitan Waterworks and Sewerage System (MWSS), and 13) Local Water Utilities Administration (LWUA). These mandamus agencies are directed to rehabilitate Manila Bay and bring back its former glory by restoring and achieving the target water SB level where it can be used for swimming, skin diving, and other forms of contact recreation.

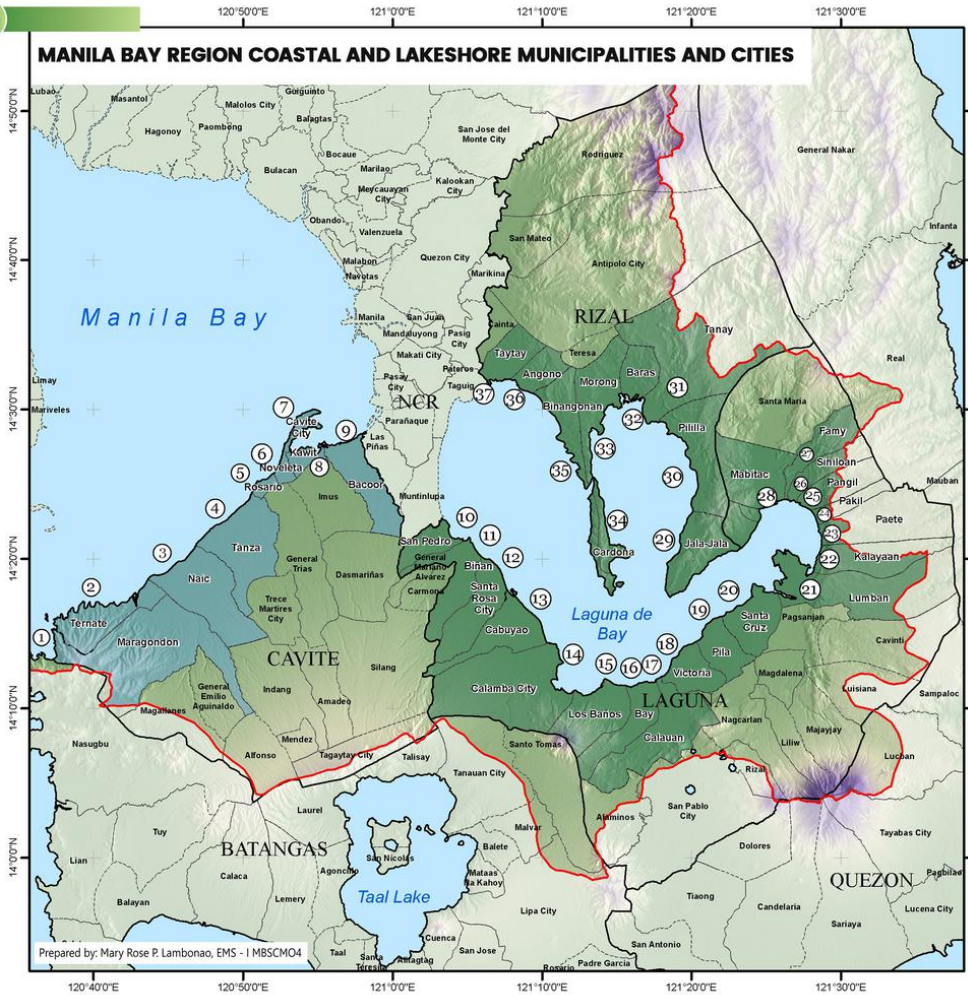




2nd Quarter Manila Bay Site Coordinating Committee (SCC) Meeting last June 23, 2022 at NDN Grand Hotel, Tanauan, Batangas

OPMBCS provides the outcomes per cluster such as Liquid Waste Management, Solid Waste Management, Informal Settler Families and Illegal Structures, Habitat Resources Management, and Institutional Arrangement. In each outcome and cluster, there were a corresponding agency/ies that addresses the different issues and matters in each outcome and cluster. Moreover, to address the issues and concerns of all the agencies as part of the mandamus, Site Coordination Committee Meeting (SCC) is regularly being conducted. During SCC meetings, all the mandamus agencies give updates on their accomplishments per quarter, as well as their targets and pending targets, if any. In addition, the issues, concerns, and unresolved matters in each mandamus agency are addressed during the SCC meeting. It is an avenue to collate an in-depth resolution and comments regarding the different matters concerning the OPMBCS.

MANILA BAY REGION COASTAL AND LAKESHORE MUNICIPALITIES AND CITIES



1. Maragondon
2. Ternate
3. Naic
4. Tanza
5. Rosario
6. Noveleta
7. Cavite City
8. Kawit
9. Bacoor
10. San Pedro
11. Biñan
12. Santa Rosa City
13. Cabuyao
14. Calamba City
15. Los Baños
16. Bay
17. Calauan
18. Victoria
19. Pila
20. Santa Cruz
21. Lumban
22. Kalayaan
23. Paete
24. Pakil
25. Pangil
26. Sinilogan
27. Famy
28. Mabitac
29. Jala-Jala
30. Pililla
31. Tanay
32. Baras
33. Morong
34. Cardona
35. Binangonan
36. Angono
37. Taytay

- Coastal
- Lakeshore
- Municipal Boundary
- Provincial Boundary
- Manila Bay Boundary

Elevation



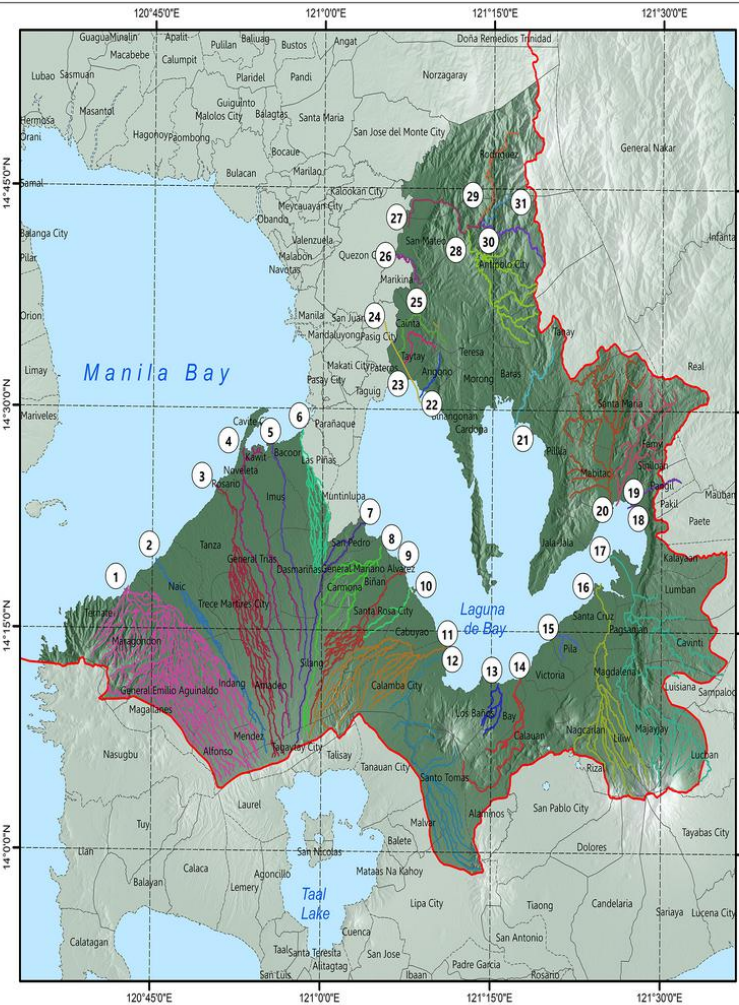
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 Datum: WGS 1984
 Units: Degree
 1:600,000

Prepared by: Mary Rose P. Lambonao, EMS - I MBSCMO4



MAJOR RIVER SYSTEMS WITHIN MANILA BAY AREA

Manila Bay Site Coordinating Management Office - 4
DENR IV-A CALABARZON

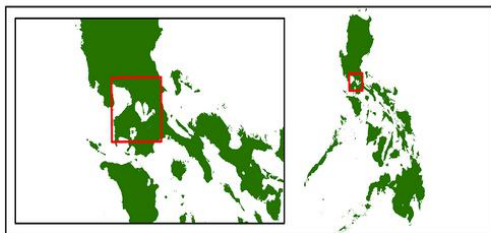


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Projection: Transverse Mercator
Datum: WGS 1984

LEGEND

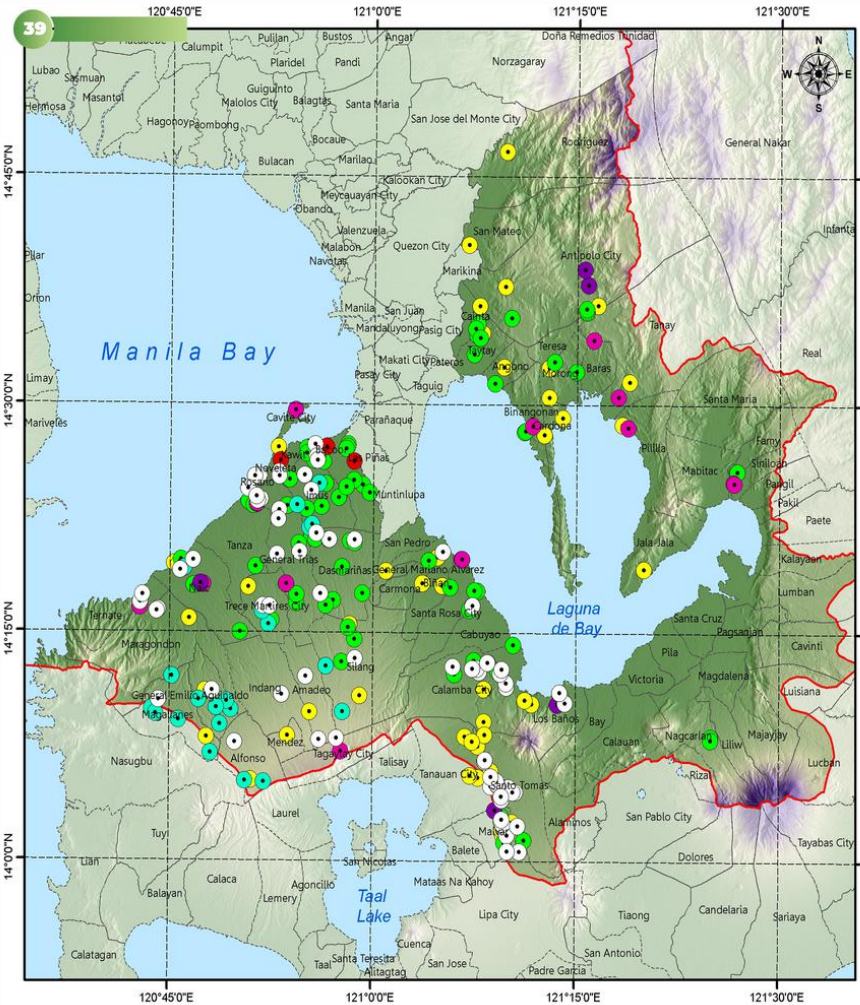
- | | | |
|---------------------------|-----------------------|----------------------------------|
| 1. Maragondon River | 13. Molawin Creek | 23. Taytay River |
| 2. Labac River | 14. Bay River | 24. Cainta River |
| 3. Cañas River | 15. Pila River | 25. Mangahan Floodway |
| 4. Rio Grande Ylang-Ylang | 16. Santa Cruz River | 26. Nangka River |
| 5. Imus River | 17. Pagsanjan River | 27. Wawa River |
| 6. Zapote River | 18. Pangil River | 28. Boso Boso River |
| 7. San Pedro River | 19. Siniloan River | 29. Montalban River |
| 8. Binan River | 20. Santa Maria River | 30. Tayabasan River |
| 9. Santa Rosa River | 21. Tanay River | 31. Sapang Baho River |
| 10. Cabuyao River | 22. Angono River | — Manila Bay Administrative Area |
| 11. San Cristobal River | 23. Hinulugan Taktak | — Municipal / City Boundary |
| 12. San Juan River | | |

INSET MAP



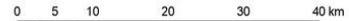
Prepared by: Lawrence S. Mojica, Mary Rose P. Lambacon, EMS - I MBSCMO4

Note: Layer and Datum of this map is not warranted free-error and should not be used for settlement of existing boundary conflict, this is for the use of DENR IV-A MBSCMO4 and no part of this map should be copied or reproduced without written permission. Subject for Ground Validation



Manila Bay Project Locations within CALABARZON

Manila Bay Site Coordinating Management Office - 4
DENR IV-A CALABARZON



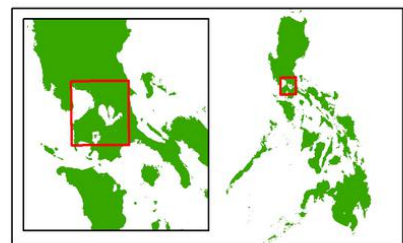
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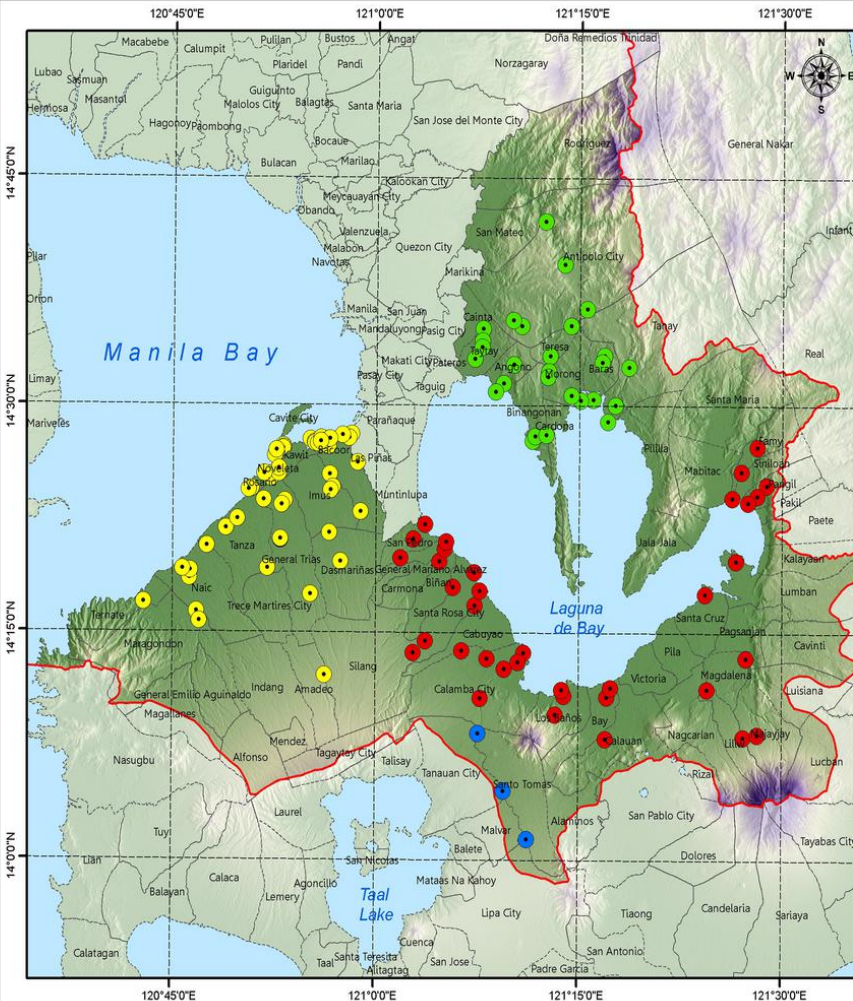
- Billboard
- Aquatic Macrophytes Biosorption System
- Composting Facility
- Biogas Digester
- Eco-garden
- Trash Nets
- Trash Traps
- Manila Bay Administrative Boundary
- - - Municipal / City Boundary

INSET MAP



Prepared by: LS Mojica, MR Lambongan, EMS-I, MBSCMO4
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Water Quality Sampling Stations within CALABARZON

Manila Bay Site Coordinating Management Office - 4
DENR IV-A CALABARZON

0 5 10 20 30 40 km

Scale: 1:600,000

Coordinate System: WGS 1984 UTM Zone 51N

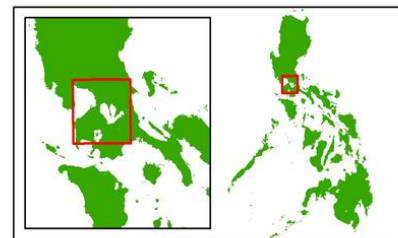
Projection: Transverse Mercator

Datum: WGS 1984

LEGEND

- Batangas
- EMB IV-A
- Laguna
- Rizal
- Manila Bay Administrative Boundary
- Municipal / City Boundary

INSET MAP



Prepared by ; LS Mojica, MR Lambonao, EMS- I, MBSCMO4

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Genesis 1:28

²⁸**God blessed them and said to them, "Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground."**

John 1:9-10

⁹**The true light, which gives light to everyone, was coming into the world. The true light that gives light to everyone was coming into the world.**

¹⁰**He was in the world, and though the world was made through Him, the world did not recognize Him.**



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