

# Danajon Bank Double Barrier Reef Rehabilitation, Protection and Management for Growth Quadrangle

**Proposed Initiative to Improve Capacity of  
and Collaboration Between Coastal LGUs in the  
Danajon Bank Double Barrier Reef**

Prepared by  
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Situationer and Background Presentation for

**Rep. Roberto Cajés**  
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# COASTAL RESOURCE MANAGEMENT

## Rationale

Coastal resources in the Philippines are severely degraded due to years of mismanagement and neglect. With the passage of the 1991 Local Government Code and 1998 Philippine Fisheries Code, the responsibility for managing fisheries and coastal habitats within municipal waters was devolved to coastal municipalities and cities in the Philippines. Over the last 6 years, coastal local government units (LGUs) throughout the Philippines have increasingly recognized the vital role coastal resources play in economic development, food security, and overall well being of coastal communities and have made substantial progress in establishing the management systems needed for sustainable use of these resources.

Coastal resource management is a participatory process of planning, implementing, and monitoring sustainable uses of coastal resources through collective action and sound decision-making. For coastal municipalities, CRM is one of the basic services that must be delivered for sustainable development. Provincial government and national government agencies provide technical and other forms of assistance to coastal municipalities.

The Danajon Bank Double Barrier Reef is a unique coastal environment within the jurisdiction of 17 coastal municipalities covering four provinces. The proposed initiative aims to rehabilitate, protect, and manage the coastal resources in this area through improved local government capacity for CRM and inter-LGU collaboration.



*Caubyan Outer Reef*

The objectives of this initiative are to:

- ✓ Maintain the biodiversity of the Danajon Bank Double Barrier Reef
- ✓ Provide “food security” for the areas around the Danajon Bank by ensuring a supply of fish and marine organisms within the area
- ✓ Increase the potential in the area for ecotourism and other environment-friendly enterprises
- ✓ Serve as a “model” for inter-LGU coordination and promote sharing and lessons learned in coastal resource management between LGUs and the four provinces

## **WHAT IS A DOUBLE BARRIER REEF?**

- ◆ Double barrier reefs are very rare geological phenomena and the Danajon Bank is certainly the only documented barrier reef in the Philippines and South Asia. Throughout the world, there are very few double barrier reefs that have been documented, making the Danajon Bank even more important to be conserved.
- ◆ The Australian Barrier Reef is a famous and protected reef. As the name suggests this is only a single barrier reef, the one in Bohol-Cebu, Leyte and Southern Leyte has two of these barrier reefs, side by side – hence it is called a double barrier reef.
- ◆ This Double Barrier Reef has been formed offshore due to an existing relief pattern off the north coast of Bohol. It is two sets of large coral reefs which formed offshore due to a combination of favourable tidal currents and coral growth on a submarine ridge which was formed in the area<sup>1</sup>.
- ◆ The Double Barrier Reef was formed over the last 6,000 years<sup>2</sup>.

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<sup>1</sup> Pichon, M 1977. Physiography, morphology and ecology of the double barrier reef of north Bohol (Philippines). Proc. 3<sup>rd</sup> Int. Coral Reef Symposium. Miami 2:262-267.

<sup>2</sup> Grobe, H. Willkom, H and Wefer, G. 1985 Internal structure and Origin of the Double Reefs of North Bohol and Olango Reef Flat (Philippines). Philippine Scientist 22 (1985):83-94

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# **LGU JURISDICTION OVER THE DANAJON BANK DOUBLE BARRIER REEF**



*One of the islands off Tubigon, Bohol where the reef starts (the Danajon Bank covers many islands with large populations)*

**There are 17 municipalities and cities covering 4 provinces with direct jurisdiction over the Danajon Bank. These are:**

**Bohol:**

**Provincial Government and the LGUs of Tubigon, Clarin, Inabanga, Buenavista, Getafe, Talibon, Bien Unido, Ubay, Trinidad and President Garcia Island**

**Cebu:**

**Provincial Government and the City of Lapu-Lapu and Municipality of Cordova**

**Southern Leyte:**

**Provincial Government and Municipality of Maasin**

**Leyte:**

**Provincial Government and Municipalities of Hilongos, Hindang, Bato and Matalom**

**Effective coordination between 16 LGUs, 1 city and 4 Provincial Governments is needed for the proper rehabilitation and management of the Danajon Bank.**

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# DANAJON BANK DOUBLE BARRIER REEF STATISTICS:

**Table 1: Consolidated data on the Danajon Bank Double Barrier Reef (CRMP-GIS, 2002 – Base map taken from NAMRIA topographic data and includes whole reef from Cebu (Lapu-Lapu City [Caubyan Island] to Leyte and Bohol Municipalities from Tubigon to President Garcia Island)**

	Caubyan reef (outer)	Calituban reef (inner)	Total for whole Double Barrier Reef
<i>Maximum width of reef</i>	4.06 km	4.27 km	
<i>Minimum width of reef</i>	0.3 km	0.13 km	
<i>Total Area</i>	143.3 km <sup>2</sup>	128.4 km <sup>2</sup>	271.7 km <sup>2</sup> *
<i>Total Length</i>	132.3 km	249.2 km	381.5 km

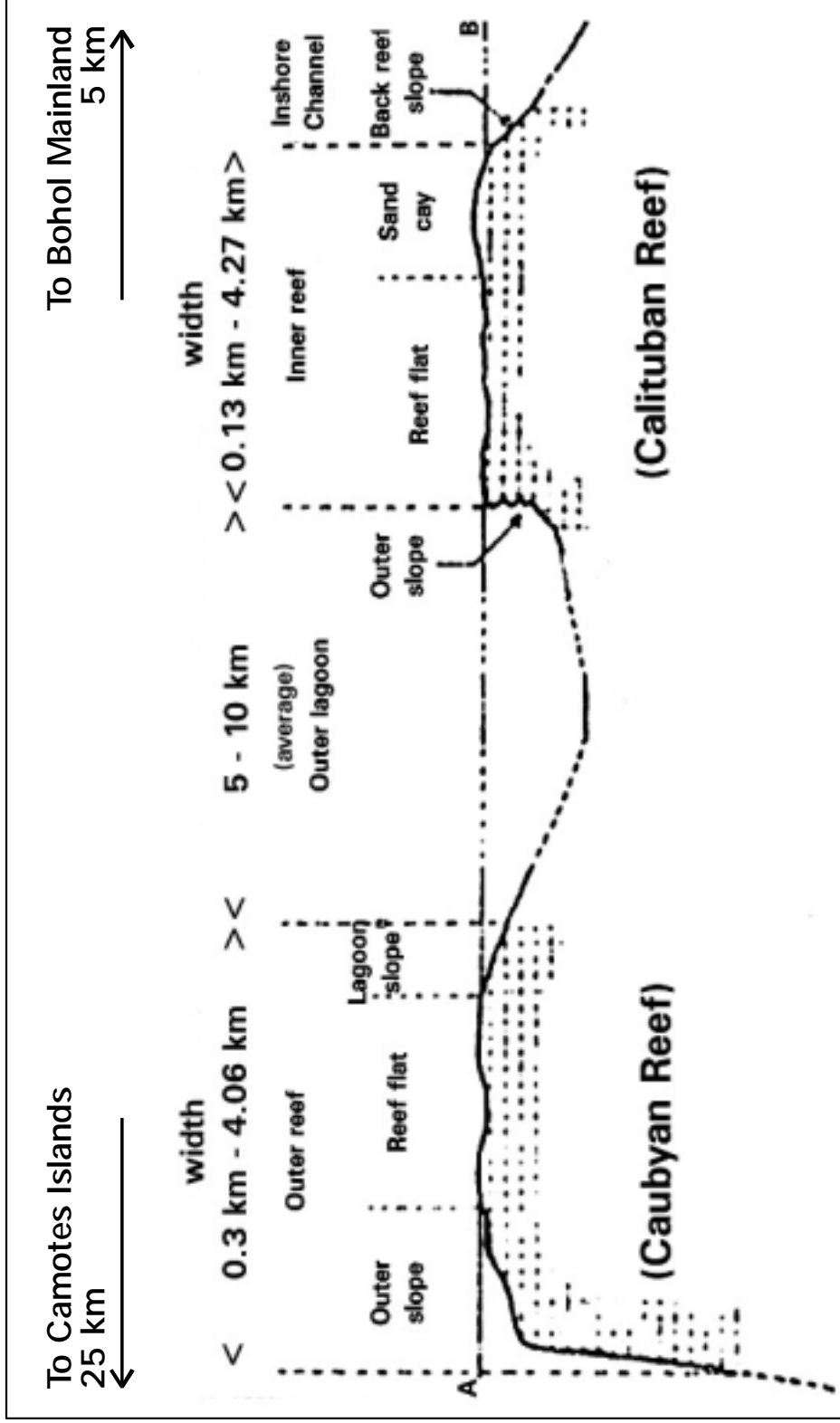
\* Danajon Bank Double Barrier Reef covers an area over 1% of the total coral reef area of the Philippines estimated to be 27,000 sq. km.



*Calituban Inner Reef (north of Getafe, Bohol)*



## Structure of the Danajon Bank



Adapted from Pichon, M. 1977

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# **WHAT IS THE VALUE OF THE DOUBLE BARRIER REEF?**

- ◆ The area in and surrounding the Double Barrier Reef is composed of coral reefs, mangroves and seagrass habitats in shallow and relatively well protected waters. It used to be very rich and productive, providing shelter and breeding area for fisheries and marine resources which have been supplying Cebu, Leyte, Southern Leyte and Bohol with food for centuries.
- ◆ It still provides livelihood for communities relying on it for fishing and subsistence activities, mariculture and seaweed farming as well as providing protection to the Provinces from typhoons, and storms as well as providing the clean water and recreational base for many activities going on in the four provinces.
- ◆ The area includes South East Asia's largest man-made mangrove forest cover, located in Banacon Island, Getafe of some 1,700 hectares of mangrove (Bakhaw - [rhizophora]).
- ◆ It acts as a huge "sea bank" and breeding area for fishes and coral reefs and supplies large amounts of young fishes and larvae upon which the rest of Bohol, Cebu, Leyte, and Southern Leyte depends.
- ◆ A variety of Elasmobranchs (sharks and rays), which enter the area are regularly seen on sale in the local markets. There is a large population of seahorses as well as numerous other unresearched marine fauna and flora. As yet, scientific research in the area has not been done and it is very important that this is accomplished soon.
- ◆ Four islands, in particular, Calituban, Baha-baha, Olango and Tahong-tahong are important feeding and roosting sites of migratory birds. These species are migrating in the Asian flyway and pass through Northern Bohol yearly. A total count in the area in 1990 found over one thousand (1,000) migratory birds belonging to over twenty (20) species (AWB 1995). Of particular interest was the annual migration of the

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*Ipil River coming out into the Danajon Bank Double Barrier Reef area - Talibon, Bohol (showing mangroves and fishponds)*

***Egretta eulophotes* (Chinese Egret) to the Danajon Bank. The Chinese egret is considered threatened on the IUCN list and the species is also included in the threatened waterbirds of Southern and Eastern Asia.**

- ◆ **Over four hundred and twenty (420) Egrets were counted in 1993 and local people have noted similar numbers until 1996<sup>3</sup>. The presence of this species can term the area as a RAMSAR site for conservation, due to the rarity of these species.**
- ◆ **Talibon group of islands are declared as protected under the National Integrated Protected Area Scheme due to their unique characteristics and resources.**

<sup>3</sup> Asian Wetland Bureau, Annual report, 1995.

IUCN - International Union for the Conservation of Nature and Natural Resources

RAMSAR - Convention which declares globally important wetlands as protected (Olango Island is a RAMSAR site)

**Diagram of the bird flyway which crosses the Olango areas and the Danajon Bank Double Barrier Reef**



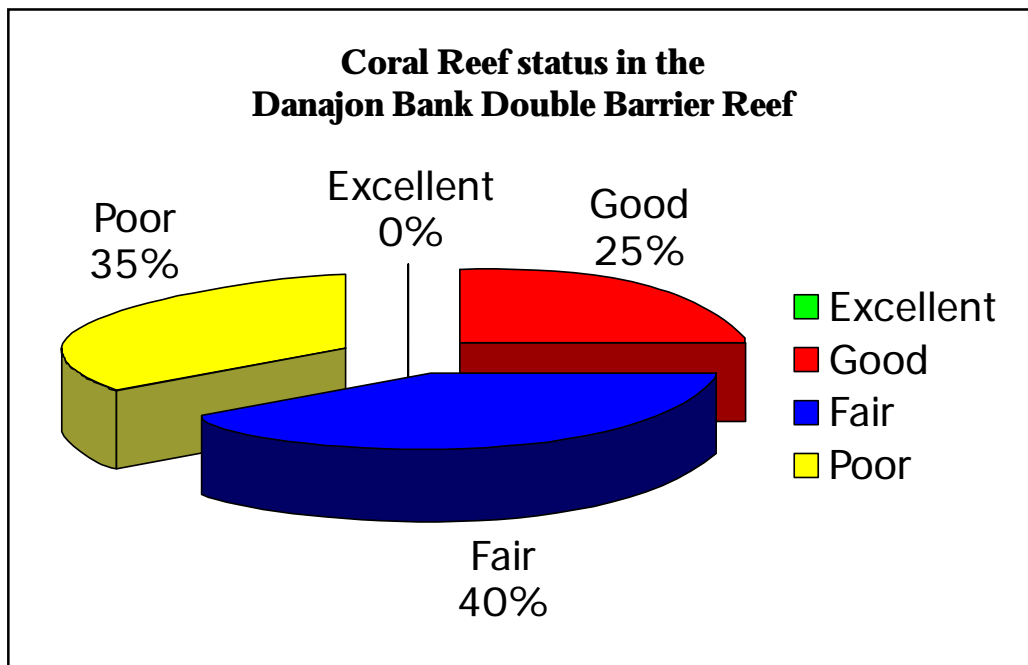
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# WHAT IS THE CURRENT STATUS OF THE DANAJON BANK DOUBLE BARRIER REEF?

The Danajon Reef fed the people of Bohol and Cebu for centuries. The decline of the Danajon Bank began in the 1950's due to rampant illegal fishing, blasting and cyanide fishing, and over-harvest of fisheries products, which was compounded in the 1960's with the aquarium fish trade in the area. The illegal actions have continued until the present time.

A recent survey done in 1997 established a baseline assessment of some parts of the Danajon Bank.

Manta tows of the reef area, conducted by the LGU of Talibon in over 100 sample sites showed very poor coral reef habitat. Based on assessments of the fish stocks there is a distinct lack of indicator fishes on the reef and in seagrass areas. Hard coral had been replaced by soft corals and algae which are a lot less productive than hard corals.



# **ILLEGAL FISHING IN THE DANAJON BANK DOUBLE BARRIER REEF**

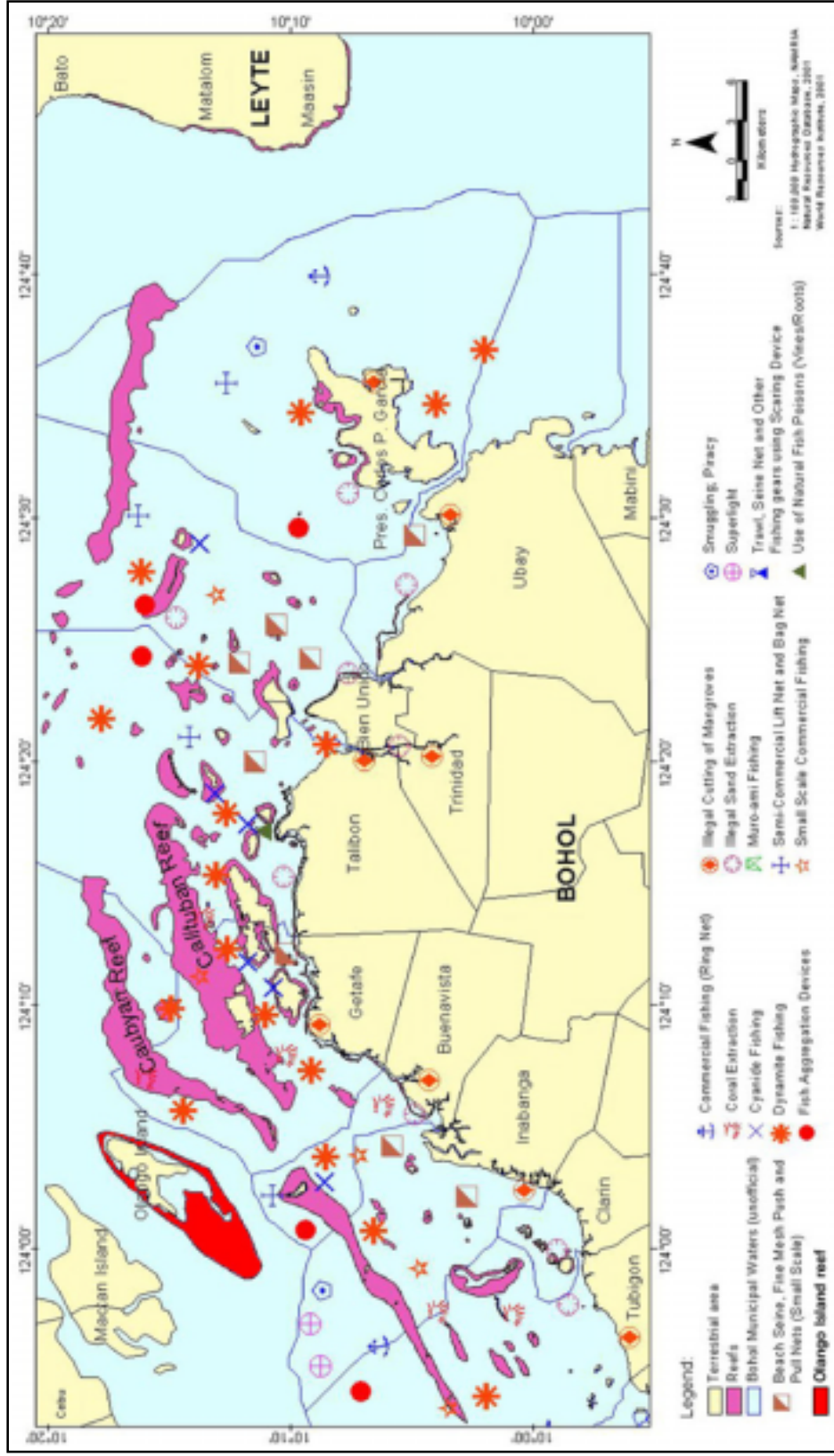
Illegal fishing is without a doubt the number one problem in the Double barrier reef.

There are many types of illegal fishing and activities in the Danajon bank area, these include:

- ◆ Dynamite fishing, using huge barrels and gallons of dynamite, this is especially rampant during early morning and evening with the blasting caps being supplied from Talisay City, Cebu.
- ◆ Cyanide and chemical use within the area, targeting of aquarium species and live fish capture
- ◆ Trawling, using fine mesh nets which literally 'plough' the bottom and destroy everything in their path.
- ◆ Use of fine mesh nets and scaring devices, 'Liba Liba', 'hulbot-hulbot', seine nets with scaring devices and other fine mesh nets which catch all fishes in their path, juveniles and other non target species.
- ◆ Intrusion of fishing gears defined as "commercial" such as large trawls, De-Ziper (seine nets with scaring devices and others)
- ◆ All of these illegal activities are killing the reef and habitats of the fishes and the fisheries in the area, causing less and less fish catch in the area and less food security and more poverty for the residents in the area.
- ◆ Finally, illegal smuggling of wood and drugs into the area from Surigao, Cebu and other parts of the country.

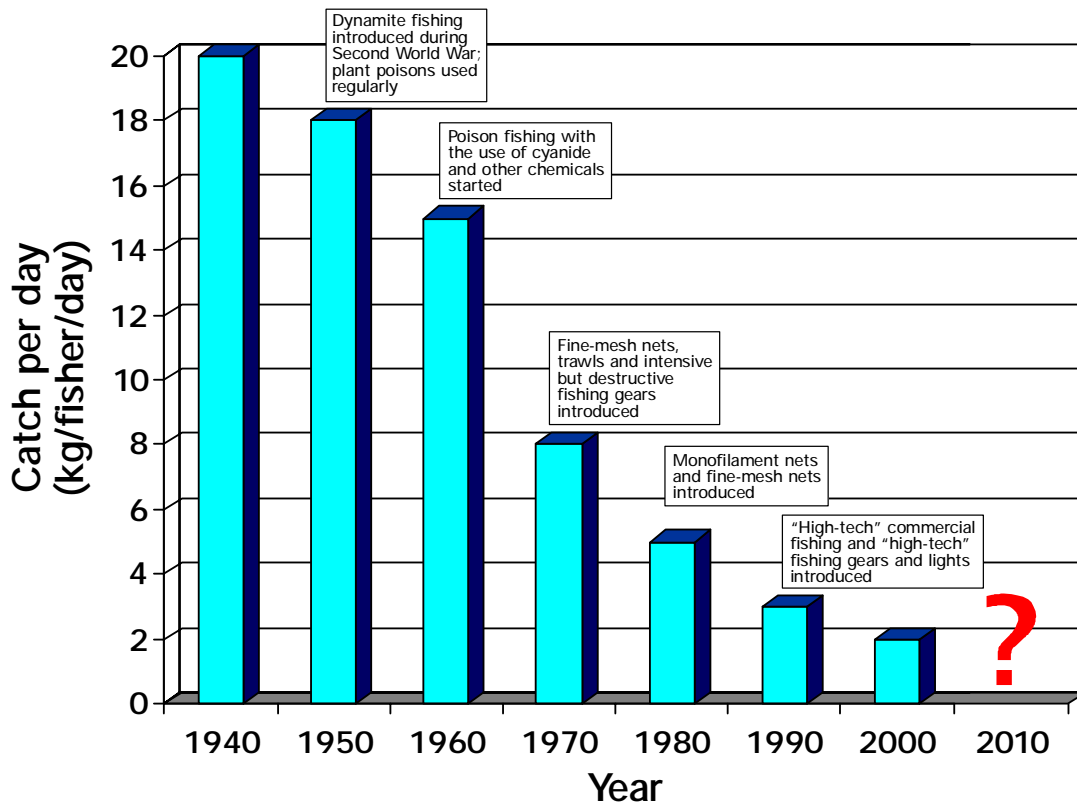
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Map of Coastal Law Enforcement Issues



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## Declining fish catch of marginal fishers in the Municipalities of Talibon and Bien Unido



Graph shows decreasing fish catch of marginal fishers in Talibon and Bien Unido as measured by catch per unit effort (kilograms per fisher per day) plotted against time. Proliferation of illegal fishing gears within municipal waters and subsequent decline in fish catch are common for the rest of Bohol. Data taken from the results of the participatory coastal resource assessment (PCRA) conducted town-wide in 1997 and from separate interviews with the fisherfolk to validate the information. Fish catch is standardized as the average catch of small-scale fisherfolk who use hook-and-line fishing gear and non-motorized (oar-driven) 'banca' or fishing boat, and fish for an average of 6-8 hours per day.

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## **OTHER PROBLEMS IN THE AREA (ILLEGAL FISHING IS ALSO CAUSED BY OTHER FACTORS)**

- ◆ Low access of local people to basic services, health services, potable water, etc.
- ◆ Low education levels in the area and especially in the islands around the area
- ◆ No common vision or direction for the various LGUs in the management and protection of the area
- ◆ Lack of coordinated coastal law enforcement in the area due to the large area for coverage and no inter-LGU agreements on coastal law enforcement
- ◆ No integrated and coordinated activities of the various agencies in coastal management, Non-Government Organizations, National Government Agencies, Local Government Units, private sector, etc.
- ◆ Municipal waters have not been formally delineated
- ◆ Rapidly increasing population

## **SECTION THREE: PRESENT EFFORTS, SUCCESSSES, AND OPPORTUNITIES**

The Local Governments of Cebu, Leyte, Bohol and Southern Leyte and the City of Lapu-Lapu and LGU of Cordova all have jurisdiction over the area. The boundaries of their jurisdiction will be established after municipal waters are delineated.

There are a variety of other institutions working in the area, including BFAR, DENR, (several areas are under NIPAS jurisdiction as protected seascapes and mangrove wilderness areas), such as Banacon Island with South Asia's largest manmade mangrove forest and Mahanay Island, both in Getafe.

Likewise, academic institutions such as Silliman University, University of San Carlos and VISCA, in Baybay Leyte are working in certain areas promoting better management and protection of the area.

The Bohol Environment Management Office and the Bohol Coastal Law Enforcement Councils have also began to work recently in the area, as well as the Coastal Law Enforcement Alliance for Region-7. There are also various NGOs working in the area such as Haribon, International Marinelife Alliance, Philippine Business for Social Progress and others.

We also have a variety of sponsors and partners interested in helping us with the management of the area such as the, German Development Service, GTZ, USAID-CRMP, Foundation for Philippine Environment, United Nations Development Program and the Japanese Embassy.

The Regional Development Council has approved a CRM Certification System, which has been developed by the Coastal Resource Management Project in coordination with the DENR, BFAR, DILG, NEDA, and other partners. This could be adopted by the various LGUs and help guide them in how to manage the Double Barrier Reef. This system should be used as guide for the LGUs in preparing their joint management of the reef area.

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## **SECTION FOUR: PROPOSED ACTIVITIES AND EXPECTED OUTPUTS**

- 1. Delineate all municipal waters in the Danajon Bank area - Once the LGUs municipal waters are delineated, the jurisdiction will become a lot clearer and we will be able to start working for the joint management of the area.**
- 2. Next step is for the different provinces to send requests to the DENR, NGOs and other agencies and LGUs to help start compiling their resources on the Danajon Bank and start sending them to Provinces for consolidation.**
- 3. The provinces should also encourage their LGUs to conduct resource assessments and more specifically participatory activities involving the local communities in mapping out the resources and identifying the issues and problems in the Danajon Bank area (i.e. Participatory Coastal Resource Assessment).**
- 4. After the LGUs have begun preparing their information and delineation of municipal waters in the Danajon Bank area has been conducted, we will conduct a stakeholder's congress on the Danajon Bank, within year 2002 to concretize what direction we must take for the Danajon Bank. – Each Province / LGU will be expected to present papers on what they are doing towards the management of the area.**
- 5. Establish / create a special committee in the RDC to focus on protection and management of the Danajon Bank Double Barrier Reef, composition to be decided, but it should be chaired by the RED of DENR.**
- 6. Establish a series of inter-province quarterly meetings to update each other on our activities in the Danajon Bank area**

7. **Establish inter-agency task force which focuses on coordinating the coastal law enforcement initiatives and activities in the area.**
8. **Full force law enforcement in the area in coordination with the Coastal Law Enforcement Alliance for Region 7, the Coastal Law Enforcement Council (2<sup>nd</sup> District) of Bohol and the other Provincial and local initiatives in the area.**



*Outer Reef Bien Unido*

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## **SECTION FIVE: KEY STRATEGIC INTERVENTIONS WILL BE BASED AROUND THIS COMMON FRAMEWORK FOR THE AREA**

- ◆ Conduct a baselining process and profiling of the whole area including oceanographic study of the area and identification of critical issues and habitats.
- ◆ Identify the source of the illegal fishing activities, supply routes of blasting caps, cyanide, illegal lumber and drug trafficking in the area
- ◆ Strong law enforcement component for the Bank area with regional integration of PNP personnel and training for the area, development of inter-province communication system and licensing systems for fishers using the Danajon bank areas – Building on the Regional and local law enforcement initiatives already on-going
- ◆ Development of an integrated management plan for the Danajon bank area which integrates management of the area between the respective LGUs and provinces
- ◆ Identification of large marine sanctuaries within the Danajon Bank area which will be LGU and community managed and initiated
- ◆ Identification of other habitat and fisheries management interventions which will be applicable to the area
- ◆ Develop by the end of this year a technical working group for the Danajon Bank, which will meet quarterly to discuss updates, on-going initiatives, and other activities. (Each Province will take it in turn to host this activity on a rotation basis with Bohol conducting the first one this year)

## **SECTION SIX: ASSUMPTIONS**

- ◆ **What is important is that we go through various stages for the Danajon Bank activity and it will take time. This will however give each LGU and province time to generate information at the field level, assign and allocate resources and finish off the delineation of their municipal waters. It is also important to note that we will be building on the current initiatives in the area and this initiative should work together with the already initiated activities.**
- ◆ **Previously established marine sanctuaries, law enforcement initiatives, and livelihood activities will be built upon. We do not intend to re-invent the wheel with this project but just build on what has already been done and try to take a more regional approach to the management of this rare geological feature and rich resource.**
- ◆ **We would also like to ensure that these initiatives and management is an LGU driven approach, with the lead agencies implementing the activities being the Local Government Unit, which is the lead for management as defined in the Fisheries Code and Local Government Code of 1991. Provincial Government and NGAs should offer technical assistance in how to make this a regional initiative and help our LGU's take advantage of this huge resource, which is in a severely degraded state.**
- ◆ **Each province will assign a point person at the province level and allocate budget for the various activities required for the integrated management.**
- ◆ **Enterprise development options will be considered later on, but by protecting and managing the reef the livelihood of the local fisherfolks in the area will be assured.**
- ◆ **The area is an important resource and should be managed by the LGUs in the area and there is no need for the declaration of the area as a NIPAS site or other mechanism, the LGU's should be the ones to manage this.**

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# **A COMMON CRM FRAMEWORK WHICH SHOULD HELP GUIDE THE IMPLEMENTATION OF THE PROJECT**

- ✓ Municipal waters delineated by following DENR DAO 17, series of 2001
- ✓ Budgets allocated by LGU for CRM and coastal law enforcement
- ✓ Municipal Fisheries and Aquatic Resource Management Councils active and organized
- ✓ Five year participatory coastal management plans drafted and adopted
- ✓ Municipal ordinances on coastal management, passed and implemented
- ✓ Marine sanctuaries declared and managed
- ✓ Environment friendly enterprises implemented
- ✓ Mangrove areas declared under Community Based Forestry Management Agreements
- ✓ Municipal fisheries management in place begins with fisherfolk registration and licensing
- ✓ Coastal Law enforcement equipment purchased and patrol activities taking place
- ✓ Other habitat management and protective measures in place



*Island off Baybay, Leyte*

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