

Initial Observations on Coastal Resource Management in the Municipality of Calintaan

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1. Introduction

The Municipality of Calintaan is located on the west coast of the island of Mindoro, the Philippines. Calintaan is within the province of Occidental Mindoro and is part of Region IV, the southern Tagalog region. The municipality has a coastline of about 19.3km, extending from the mouth of the large Lumintao River in the south to the Busuangan River in the north (Figure 1). It is bordered by Rizal (to the south) and Sablayan (to the north).



Figure 1. Municipality of Calintaan, Occidental Mindoro

The upland area of the municipality is mountainous and there is the large Mt Iglit – Baco National Park, a NIPAS reservation for the native Tamaraw, a small buffalo. The relatively wide coastal plain has clayey soils that have been developed extensively for agricultural use, particularly rice (*palay*) production. There are numerous gravity irrigation channels from the main rivers that allow for two annual harvests. There is widespread use of chemical fertilizers.

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There are four major rivers that flow to the sea within the municipal boundaries (Lumintao, Anahawin, Nagapi, Busuangan) and numerous smaller creeks including the Marasombol, Niyayos, Buac, Wawa, Banos and the Bingag. Many of these creeks are used for catching milkfish (*bangus*) fry.

There are three coastal villages (*barangays*) in the area. These include Poblacion, the commercial and administrative center, Iriron and Concepcion. The southern portion of the coastline is within the barangay of New Dagupan. There are about 400 fisherfolk in these four barangays that earn their livelihood within the municipal waters. The standard of living in the municipality is modest (electricity, few telephones, well water, degraded roads) and the traditional fishers 'appear' to be amongst the more economically marginal members of the community.

1.1 Objectives of CRM

The Bureau of Fisheries and Aquatic Resources (BFAR) has identified two main objectives of CRM, socio-economic and environmental. This involves the alleviation of poverty in the coastal communities particularly among the sustenance fishermen. CRM aims to bring about the optimum utilization of coastal resources and to bring perpetual benefits to the most number of users as possible. Through CRM, the rehabilitation of destroyed habitats, the regeneration of depleted resources, and the bringing about of sustainable management are hoped to be achieved (DA 1999).

2. The Coastal Area²

In the south of the municipality, near the Marasombol River entrance, there is a nearshore coral reef of about 50ha that runs along the shore for about 1.5km. There are isolated reef outcrops amongst areas of sand and silt, which may suggest sedimentation. Sources of sediment include the potentially eroding coastline and river sediments. The creeks also flood during the wet season (June – September) and substantial deltas are evident at the entrances. The beach material is gray, coarse gravel.

There are some large trees in this area, isolated mangrove and nipas stands and extensive cleared areas. The Niyayos and Marsombol entrances have bangus fry catching operations and the nearshore coral reef area is leased from the LGU by a local fishing co-op (CALIFFCO) as a fry catching area.

The coastline to the north is long gravel/sand beach of about 10km (**Figure 2**). The offshore slopes are very steep (4:1) and depths of 200 fathoms (360m) are evident within 2km of the shoreline³. Tidal range is about 1m, long-shore currents are generally less than 1kn and there is a low energy wave climate (NAMRIA 2001, BN 1978). During the southwest monsoon from April to October there may be more energetic ocean conditions during 'active low pressure' or typhoon conditions. There is very little evidence of seagrass beds and limited stands of mangrove forests in the Poblacion area.

² Based on personal observations of the author and discussions with fisherfolk and CRM personnel

³ British Admiralty Chart BA3819, published in 1938 with revisions up to 2000.



Figure 2. Coastline at Poblacion (looking north)

At the northern end of this long beach is the barangay of Iriron and sitio Wawa (**Figure 3**). The sand is whiter, finer and the offshore slopes are less dramatic than at Poblacion (40:1). There is a mangrove plantation (*bakawan bato*) established last year on the small rocky point and fringing reef. There are a few mangrove stands on several creeks. There is a bangus fry catching operation and a privately operated fishpond (bangus and tiger prawn *sugpo*) in Wawa. To the north there is a second long sweeping sandy beach (Ragara Beach) of about 8km and the offshore monolith of Bato Tabao (Iriron Rock), standing about 12m above water level (**Figure 4**).



Figure 3. Protected Bay at Sitio Wawa, Iriron



Figure 4. Ragara Beach and Bato Tabao Fish Sanctuary, Concepcion

Bato Tabao is located about 1km offshore and fringed by coral reef (3ha). A survey (BFAR 1999) suggested good coral cover with 60% hard corals and 37% dead coral. There is a steep drop-off from the reef and depths of 15 fathoms (30m) are evident.

Opposite barangay Concepcion there is a coral reef with good coral cover (60% hard coral) including the branching and foliose type. The reef is exposed at low tide. This area offers shelter to fishing boats from the NE monsoon (Dec – May). There are some mangrove stands along Banos creek and fringing reef and sand to the north.

3. Current Fishing Practices⁴

The marginal fishers appear to live a very day-to-day existence strongly influenced by weather and seasons. They use small non-motorized or motorized wooden boats (*bancas*). The base of the bancas is carved from local timber and the body constructed using plywood, epoxy and nails. They have bamboo stabilisers that are attached mostly by fishing lines and nails (**Figure 5**). Fishers use single blade paddles and the boats are named after family members. They are left along the beach during the day with coconut palm fronds used to stop the drying of the wood by the tropical sun. Single fishers go to sea generally during the night and early morning.



Figure 5. Fishing bancas, motorized and non-motorized

Fishing gear is mostly hook and line during April and May. Thin strips of a material are cut and then various colourful combinations tied directly to small hooks (no eyes). They are then shaped with a sharp tail to mimic a small fish (artificial bait). About 15 hooks are placed on a line at 0.5m spacing. Hand reels include lumps of polystyrene, cuts of bamboo and stylish reels hand-carved from local timber. A small weight is used as a sinker.

Fishers use a locally made ‘Coleman lamp’ or ‘super-light’ powered by kerosene. Lamps are suspended downwards from the port and starboard sides of the *bancas* to illuminate the water. This method attracts schooling fish but is no good for about one week during full moon. Increased turbidity following a strong afternoon wind (>10 knot SW) can also affect fishing conditions and many fishermen do not go to sea.

Most of the fishermen in Poblacion fish within a few kilometers of the shoreline. Motorised bancas (5-10hp diesel) and the adventurous may go further offshore. Fish caught during April 2001 include *tambakol*, *tulingan* (tuna) and *aloy*. There has been an occurrence of schooling *bilang bilang* (moonfish) for a few afternoons that was fished with fervor. *Bilong Bilong* makes a great soup, can be salted for preservation during the rainy season, and offers a welcomed variety.

⁴ Based on personal observations of the author in April/May 2001 and discussion with fisherfolk and CRM personnel

Another variation was the capturing of *homoy homoy* (English fish) during the full moon. Fishermen would scour within 10m of the shore, tapping on the side of their boats to attract the fish.

The largest volume of catch is from the beach seines or '*pukot*', which a number of families use (Figure 6). The nets are about 200m long with a fine-mesh 'bag'. A bancas with superlights attracts the fish near the shore and another boat paddles from the shore and encircles the fish. This net is then pulled to shore by children, neighbors and family members who receive some share of the catch for their efforts. A good catch can be more that 200kg (P4000) and can include *tambakol*, *aloy*, *pusit*, *homoy homoy* and a variety of by catch. Their catch is weighed and stored on ice.



Figure 6. Catch from pukot (beach seine), April 2001

Fish marketing is done early in the morning by the women and children. They street vendor or sell at the local market. Prices vary from P25 to P50/kg depending on the type of fish and abundance of catch. Fishers rest during the heat of the day in the *sariwang-bangin*. Mending holes in the *pukot* occurs during the late afternoon. Nets become very worn after 2 or 3 years. Artificial baits for hook and line need to be replaced about weekly.

There are numerous commercial fishermen that unload some of their catch and re-supply in Poblacion and Concepcion. There are a large number of *payaos* (Fish Attraction Devices or artificial reefs) adjacent to Poblacion (Figure 7). These are generally bamboo and palm leaves suspended from buoys. Algae or '*lumot*' grows on the vegetation and attracts schools of fish.



Figure 7. Payaw near Poblacion

Deep-sea fishing is done in the larger bancas with 15hp engines and about two or three crew. These are generally owned by people in town and leased to the fishermen. They fish for *tulingan* at “triente-siete (37) fathoms bank”, a deep reef about 30km offshore in Mindoro Strait.

The wet season can be particularly hard for marginal fishermen. The south-west monsoon from May to October brings storms and strong onshore winds to the west coast of Mindoro. The near-shore waters become very muddy due to the strong rains (400mm/month) and runoff from the numerous rivers and creeks. Fishermen will go to sea between storms if the water is clear. Throw nets or *lambat* are commonly used during the wet season. Families may stock-up on rice, *mongos* (lentils or beans), salted fish to get through these lean seasons. Some fishermen help farmers to plant *palay* during this season.

There are numerous bangus fry operations in the municipality and the fry is sold to the fish farm in Iriron or numerous farms in Rizal or San Jose (Figure 8). This business is also seasonal and the best season is April/May, prior to the SW monsoon. Floods during the wet season reduce the catch. Very few of the entrances have natural mangrove stands and water quality may be influenced by the use of chemical fertilizers of the *palay* fields. Entrances appear to be artificially scoured to allow a tidal flow during the dry season. Fry catchers are trained and very skillful at identifying the correct species (two small black eyes and a clear body).



Figure 8. Bangus fry catching in Concepcion

4. Current Status of CRM

The Municipality of Calintaan has been undertaking CRM for a number of years. The Municipality has achieved a number of goals of CRM to date including the development of a draft management plan, the creation of a fish sanctuary and the establishment of barangay FARMC's.

4.1. Draft CRM Plan

A draft coastal resource management program has been developed by a CRM planning committee. This document has identified various issues, opportunities and constraints for CRM in the municipality. They have identified a vision of:

“BALIK KALIKASAN SUSI NG KAUNLARAN”
(Maintain and Improve our Natural Resources)

Numerous coastal management projects and livelihood opportunities were identified as summarized in Table 4.1.

Table 4.1. Existing Coastal Resource Management Plan

Program	Projects	Status
1. Coastal Management	-Information and Education campaign	
2. Coastal Security	-Waste Management and coastal clean-up -Bantay Dagat (patrol boat and training) -Mangrove reforestation -Watch tower at Bato Tabao	✓ ✓ ✓
3. Improved Productivity	-Artificial Reefs, FAD -Fish Sanctuary	✓ ✓
4. Socio-economic upliftment	-Fishing Co-op development (training, accreditation) -Fishing Co-op development soft loan -Semi-commercial fishing vessel w/ purse seine -Training (fish processing, canning, fishing technologies)	✓
5. Tourism Development	-Tourist lodge -Agro-industrial trade fair	
6. Sustainable Community Organization Development	-Municipal FARMC training -Barangay FARMC training	✓ ✓
7. Support Services	-Ice plant / cold storage -Fishing Port	✓
8. Administration	-Municipal CRM Officer	✓

4.2. Bato Tabao Fish Sanctuary

A fish sanctuary was officially opened at Bato Tabao on April 30, 2001. Official guests including provincial officials, the mayor, barangay captains and BFAR personnel were present and buoys were placed to demark the boundaries of the sanctuary, approximately 50ha. A municipal resolution for the fish sanctuary has been passed and a draft ordinance is being developed in consultation with FARMC. Signboards will be developed and an ongoing education campaign is necessary. BFAR and an international NGO may provide ongoing financial assistance for maintenance of the sanctuary.

4.3. Mangrove Reforestation and Education

An international NGO, Plan International, has also been undertaking CRM activities in the municipality during the last few years. This has included the successful planting of *bakawan bato* (mangroves) at sitio Wawa, Iiron (**Figure 9**). Plan International has also conducted CRM training activities with local school children and intend to provide ongoing support to CRM in Calintaan.



Figure 9. Mangrove plantation supported by Plan International, Wawa, Iiron

4.4 Implementation of Philippines Fisheries Code 1998 (RA 8550)

Barangay FARMC's were formed last year in Poblacion, Iiron and Concepcion, following training by BFAR. These groups are responsible for day-to-day implementation of RA 8550 in municipal waters. These groups are excellent vehicles for implementing CRM.

There have been some initial difficulties with operation of the municipal FARMC but these have been overcome. There is a motorized banca for the Bantay Dagat (community coast guards) in each coastal barangay and a patrolling schedule is being developed. Some further training, equipment (radios, GPS) and an annual commitment to maintenance (gasoline) is necessary.

The municipal fishing ordinance needs to be revised to accommodate some provisions in R.A.8550.

There is support for CRM and RA8550 from many members of the marginal fishermen but also some significant opposition. There are a number of fishing co-ops in the municipality but many of these are not successful.

Significant education, training and information dissemination is required to engage marginal fishermen and encourage participation in CRM.

4.5 Available Data and Resources

The Municipal Planning and Development office undertakes bi-annual socio-economic surveys in the municipality. This includes information on population, livelihood and income (MPDO 2001). Maps of vegetation, education and health facilities and land slope are also available.

Topographic maps (1:50,000 and 1:250,000) of the municipality of Calintaan are available. They are produced by NAMRIA. British Admiralty charts (1:100,000) of the area and Mindoro straight are also available. Meteorological data is available from PAG-ASA in San Jose, 40km to the south. Data includes daily rainfall, wind, humidity and pressure. PAG-ASA also provides typhoon warning via radio. Tides are measured at San Jose and tidal predictions available from NAMRIA in Manila.

NAMRIA can develop Coastal Resource maps from satellite data (LANDSAT). This requires an initial field survey by municipal CRM personnel to locate areas of coral, mangrove, seagrasses, rock reefs and sand. NAMRIA will develop an A3 map at 1:50,000 scale and calculate the areas of these resources. This map will be invaluable to the coastal area profile.

An underwater video survey of coral reef near Bato Tabao was undertaken by BFAR in the 1999. A report identifying coral and fish species has been developed.

Fisheries data is available from the MPD planning report. DA records are brief but there are many experienced people who can offer valuable fisheries data. Fishing Co-op records are a further data source. The Coastal Resource Management Project in Cebu City also collates municipal coastal data, including fisheries data, for a nationwide database.

The Department of Agriculture has personnel assigned to give technical assistance for CRM.

There are experienced CRM managers and marine biologists in Sablayan, 50km to the north. They work with the CIPAP Apo Reef marine park, offshore of Sablayan.

A wealth of management manuals and CRM tools are available from an Internet site developed by the Coastal Resource Management Project in Cebu City, Philippines (www.oneocean.org). There is no Internet service available in Calintaan but there is an Internet café in San Jose (P75/hr). Many of these manuals have been downloaded onto CD and transferred to the municipal computer in the MPDC.

Technical assistance and CRM materials are also available from a number of organizations in Manilla including BFAR, DENR, University of Philippines and the international volunteer organizations of Peace Corps and VSO.

Locally, the BFARMC members and CRM officers in the municipality are invaluable sources of information on the coastal area.

5.0 Management Options, Livelihood Opportunities & Funding

Data gathering and the generation of a coastal profile is an essential first stage of a CRM plan and should be used as a vehicle for education (PCRA). However, the assessment of management options and provision of livelihood

opportunities are the primary concerns and attractions to CRM for the wider community. In particular, the potential of receiving funding for livelihood projects through CRM inspires enthusiasm.

The need to develop a CRM plan to thoroughly assess the ability of each management option and livelihood opportunity to achieve the objectives of CRM is critical. This has yet to be undertaken in a participatory and thorough manner to date. This would involve a detailed assessment of each option with regards to outcomes, difficulty of implementation, cost, sustainability and other factors. Options that provide livelihood opportunities to fisher families during the rainy season (July – October) will be considered strongly.

A range of options presented by community members in informal discussion to date. These include the following:

- ❖ Livestock raising (goats, pigs, chickens)
- ❖ Seed dispersal and small-scale vegetable growing
- ❖ Seaweed farming
- ❖ Micro-credit enterprises (soft loans)
- ❖ Fish preservation and processing (drying, smoking)
- ❖ Rolling store
- ❖ Fish cages
- ❖ Commercial fishing (municipal basing)
- ❖ Boat making
- ❖ Handicrafts (basket weaving, chairs)
- ❖ Tourism

These options will be canvassed for further comment amongst the fishing community. Feasibility studies will be progressed for the preferred and pragmatic livelihood projects, in association with FARMC.

6.0 Goals for CRM

The primary goal for CRM in Calintaan is to document the ideas and visions of the fishers in a 5 year CRM plan for the municipality. This consists of the following stages

1. *Coastal Profile*: Data gathering and map making
2. *CRM Plan*: Assessment of management options and livelihood opportunities, identification of funding opportunities

Developing the ability of marginal fishers and their representatives to obtain funding for and successfully manage these projects is a primary goal of the CRM plan. There is a variety of financial support available for municipal fishermen at the municipal, provincial, national and international level. Fishers in Calintaan have requested assistance to identify funding sources and to develop their skills in completing the paperwork necessary to fund livelihood projects. The development of effective fishing co-ops to manage these projects is also critical.

Another critical component of the CRM plan is an ongoing EDUCATION campaign. The initial goal of the campaign is to make fishers aware of the CRM objectives and process and the incentives for them to become involved in

CRM. This is a two-way process of *listening* to the fishers concerns and ideas and *informing* them of progress and assistance available.

This will be undertaken both informally through the community and during formal Participatory Coastal Resource Assessment workshops. These workshops will be designed to outline the participatory CRM process, to engage participants to help develop a coastal profile and to collate ideas for livelihood projects. The participation of woman's and youth groups and municipal councilors will be encouraged.

7.0 References

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Acronyms

BFAR	Bureau of Fisheries and Aquatic Resources (DA)
CIPAP	Coastal Integrated Protected Areas Program
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
FARMC	Fisheries and Aquatic Resource Management Committee
MPDO	Municipal Planning and Development Office
NAMRIA	National Mapping and Resource Information Authority
PCRA	Participatory Coastal Resource Assessment

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