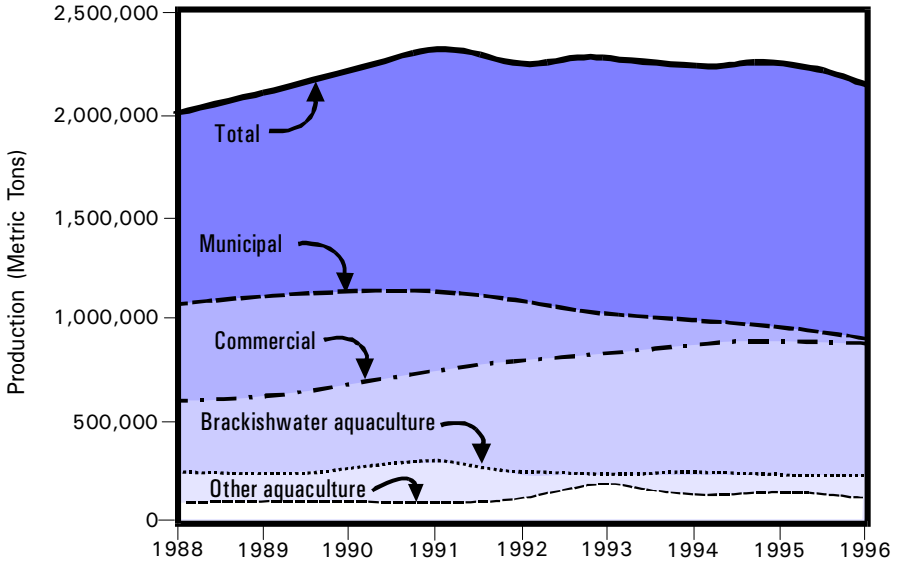
STATUS ALERT
Fisheries

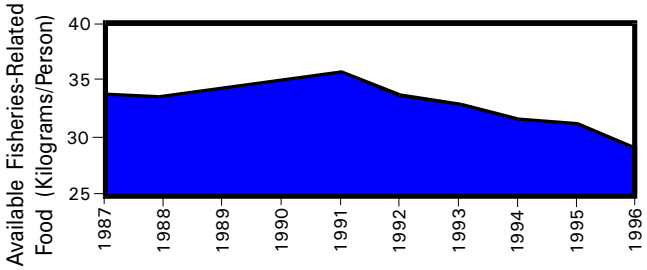
The supply of fish throughout the world is becoming scarce. As the supply continues to decrease, it will become increasingly difficult to meet the food requirements of the world's population. More than 60 percent of the world's 200 major fish stocks are fully exploited, over-exploited, or depleted. The world catch of fish peaked in 1989 and has declined ever since despite increased numbers of, and more efficient, fishing vessels and gear. The answer to this decrease in the amount of fish available as food is not to increase pressure on the resource by allowing more fishing, but to reduce pressure and allow the stocks to recover.

The Philippines is facing the beginning of a crisis in the security of food from coastal waters. The total amount of fish available as food from capture fisheries and aquaculture has remained relatively static since 1987, with dramatic declines in municipal fisheries catch. With population growing at approximately 2.5 percent per year, this translates to a net loss of locally derived fish protein to Filipinos.



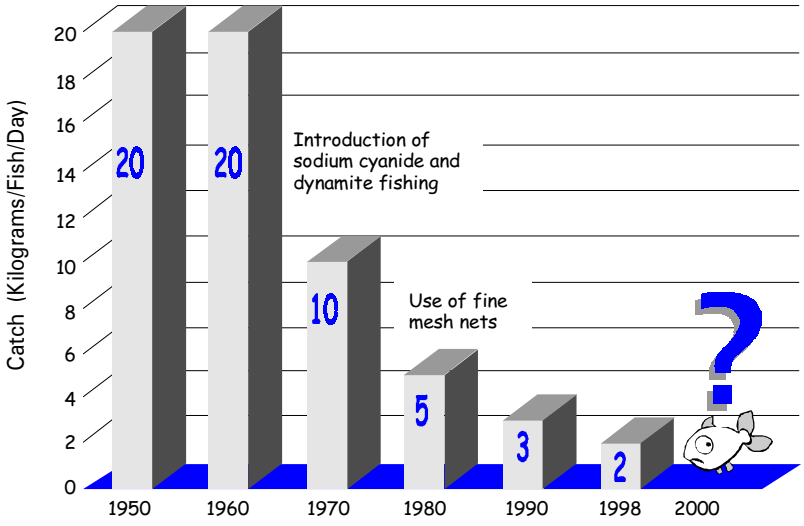
Fisheries-Related Food Production for 1988-1996 (BFAR 1997)
Note: Does not include seaweed production which primarily is used for industrial purposes.

Although fisheries-related food production has been relatively static for the 10-year period in question, a slow and continuous decline is apparent when total production is evaluated as kilograms of "fish" available per person per year as shown in the figure below (fish is defined here as all edible marine products and includes both animals and plants). This decline is driven by population growth, increased fishing pressure, destructive fishing practices, and unsustainable fisheries and aquaculture development.



Per Capita Fisheries-Related Food Available for Consumption for 1987-1996 (Based on production data from BFAR 1997 and population data from Bernascek 1994)

In small island communities, such as Olango Island, Cebu, the catch per fisherman is lower than national averages. Olango fishers have estimated that their current daily fish catch per fisher is 2 kg per person. A similar tren is reported by Katon et al. (1998). They report that fishers in Cogtong, Candijay, Bohol found their catch decreasing from 20 kg/day in the 1960s to around 3 kg/day in the 1990s.



Trend of Estimated Daily Fish Catch per Municipal fisher for One Barangay, Olango Island, Cebu (Result of community assessment of coastal resources conducted by the Coastal Resource Management Project 1998)

Factors contributing to the decline in fisheries-derived food:

- Open access to fishery resources
- Continued increases in commercial and municipal fishing effort resulting from increased number of fishers, fishing vessels, and overly efficient gear
- Increased population growth in and migration to coastal areas
- Slow economic development in coastal areas providing few alternatives to municipal fishers
- Use of fishing practices and gear destructive to habitats and fisheries
- Illegal commercial fishing in municipal waters
- Degradation of coastal habitats
- Loss of mangrove forests from conversion to fish and shrimp pons and other uses
- Overall lack of implementation of coastal management programs at local and national levels

Signs of overfishing

- Decreasing catch per fisher per day
- Decreasing size of a fish species caught
- Change in types of fish caught to species composition low on the food chain

Other factors contributing to the decline of fisheries

- Pollution from land-based sources of industrial and agriculture waste dumped into rivers and carried to the coastal areas, including pesticides, fertilizer run-off, and sewage, oil from sea-based sources, toxic wastes, and excess nutrients from marine transportation operations or mariculture activities
- Habitat degradation resulting from siltation of coral reefs from deforested upland areas, conversion of mangrove areas for ports and harbors, fish ponds and other shoreline development
- Spatial conflict where coastal fisheries and aquaculture have insecure property rights and are gradually squeezed from their traditional areas by other coastal developments such as urban sprawl and tourism development

Overfishing is the single most devastating factor facing the management of fish stocks in the Philippines. The Philippines, like the rest of the world, must take a course of action that will reduce fishing pressure to enable fish stocks to rehabilitate.

For immediate action

- Say 'NO' to programs that encourage intensification of fishing effort by promoting more vessels and gear
- Preserve municipal waters for municipal fishers using low-impact fishing techniques
- Establish marine sanctuaries to enable fish stocks and coral reef habitat to regenerate and multiply
- Stop illegal commercial fishing intrusion into municipal waters

STATUS ALERT
Water quality

The trends in coastal and marine pollution in the Philippines are not encouraging, with the incidence of pollution-related problems increasing dramatically over 20 years ago. There are more records of ecosystem failure due to pollution in areas close to urban development or areas near human settlements of any size because of domestic waste. Algal blooms are occurring more frequently and causing red tide events that kill or make shellfish and some fish species toxic. Heavy metals are being implicated in fish and human poisoning in some bays where mining occurs now, or occurred in the past. We see increasing amounts of plastics on beaches. Endocrine-disrupting chemicals from aquaculture, agriculture and other land-based activities are increasingly being detected in marine sediments. These chemicals can affect the reproduction of certain marine organisms and can be passed on to humans. The result of all this will be an increasing drain from societal welfare and economies.

The types of pollution common in the Philippines are numerous, but there are a few which are pervasive and are causing increasing harm to coastal ecosystems and fisheries production. These are:

a. Domestic sewage liquid/waste with high nutrient loads, pathogens and some toxic chemicals from coastal cities and municipalities, most of which go into the sea
b. Domestic solid waste from coastal cities and municipalities, and ships, much of which is dumped into shoreline areas or rivers and ends up in the sea
c. Sediments from upland and coastal erosion, construction sites, deforestation, poor agriculture practices which flow through rivers or directly into the sea
d. Mine tailings and sediments from quarrying and mining both in the coastal and upland areas, much of which flows to the sea through stream and rivers
e. Industrial organic and toxic wastes (heavy metals), which although often treated or restricted, end up being dumped into rivers and eventually the sea
f. Agriculture chemicals such as nitrates, phosphorus and pesticides, which mostly pollute nearby rivers, streams and ground waters, some of which go to the coastal waters
g. Aquaculture development which causes increasing acid levels in soil and water and releases nutrients from fertilizers and pesticides into nearby coastal waters
h. Oil and fuel leaks, spills and dumping from ships

About 50% of the coastal and marine pollution in the Philippines comes from runoff and land-based discharges. A sizable but undetermined amount comes through the atmosphere from land-based sources. If world trends are reflected in the country, maritime transportation and dumping may account for about 20% of the pollution.

For immediate action

a. Stop discharging untreated domestic waste into coastal waters to minimize the overfertilization of marine water, particularly in enclosed or restricted bays and lagoons and to control, to the extent possible, the introduction of human pathogens.
b. Implement laws against dumping of wastes into the sea by ocean-going and other sea vessels.
c. Site industries away from productive coastal ecosystems and concentrate them at one particular area so that less of the coast is disturbed.
d. Implement all relevant anti-pollution laws.

NATIONAL LEGAL FRAMEWORK FOR CRM

CRM is built on a national legal framework founded on the Philippine Constitution itself, which provides, under Article 10, Section 2, for local autonomy and declares under Article 12:

Section 1. "The goals of the national economy are a more equitable distribution of opportunities, income and wealth…"

Section 2. "The State shall protect the nation's marine wealth in its archipelagic waters, territorial sea, and exclusive economic zone, and reserve its use and enjoyment exclusively to Filipino citizens."

as well as national laws and policies such as Republic Act No. 7160 or the Local Government Code of 1991, and Republic Act No. 8550 or the Philippine Fisheries Code of 1998, which assign the primary responsibility for managing municipal waters and associated coastal resources to the local government, and many other national laws which protect specific coastal areas and resources.

Local Government Code of 1991

The passage of the Local Government Code of 1991 (Republic Act 7160) is of a major significance in local governance in the country. It enhanced the governmental and corporate powers of the local government units, particularly on political autonomy and decentralization, and resource generation and mobilization.

The following are the salient features of the Code with regards to CRM:

1. The expansion of the scope of municipal waters to 15 km from 3 nautical miles (approximately 5.5 kilometers). This means that local government units have greater jurisdiction over the usage and conservation of the area.
2. The repeal of anti-conservation policy of the state, as established by Section 2 of PD 704, such as optimum utilization of fishery resources and exportation of fish and fishery products.
3. Devolution of some powers and functions of the Department of Agriculture, Department of Environment and Natural Resources, and other concerned national line agencies to the local government units.
4. Assigning to the municipality and cities the right to issue licenses, leases, or permits for the use of the municipal waters.
5. Preferential treatment to the municipal fishers in the grant of fishery licenses.

Philippine Fisheries Code of 1998

The Philippine Fisheries Code of 1998 (Republic Act 8550) repealed Fisheries Decree of 1975 (PD 704). Compared to the previous law, it is more consistent with the provisions of the Constitution and opens up hope for a more pro-municipal fishers, pro-local autonomy and pro-CRM law.

The overriding policies embodied in the Code are the following:

1. Food security as the primary goal and consideration in the utilization, management and conservation of the coastal and fisheries resources
2. Limiting access of the fisheries resources for the exclusive use and enjoyment of Filipino citizens

3. Rational and sustainable development, management and conservation of coastal and fishery resources
4. Protection of the rights of fishers, especially the coastal communities, with priority given to municipal fishers in the preferential use of the municipal waters. To operationalize this policy, coastal municipalities and cities are mandated to organize Fisheries and Aquatic Resources and Management Councils (FARMC).
5. Management of coastal and fisheries resources in light of the concept and principle of integrated coastal area management.

Other National Laws Related to CRM

Presidential Decree 705 (Forestry Decree of 1975) — governs the utilization, development and conservation of all forest lands and forestry products, including mangroves.

Presidential Decree 1067 (Water Code of the Philippines) — established the framework relating to the appropriation, control and conservation of the water resources to achieve optimum development and rational utilization of these resources.

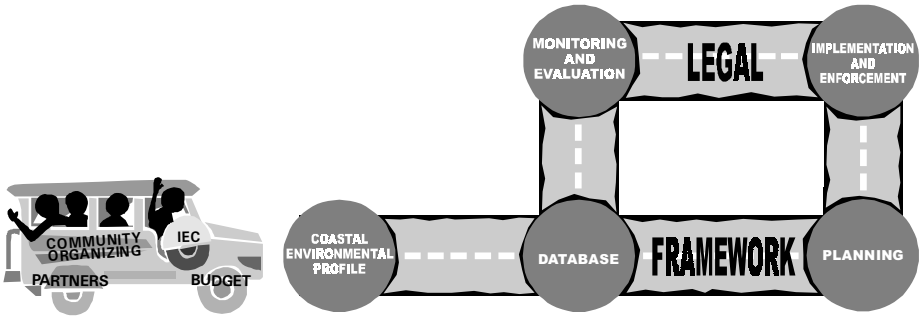
Presidential Decree 1586 (Establishment of Philippine Environmental Impact Assessment System) — mandates all government agencies, including government-owned and controlled corporations, as well as private corporations, firms and other entities to conduct environmental impact assessment before establishing or implementing projects that would affect the environment

Republic Act 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990) – regulates the importation, manufacture, processing, sale, distribution, use and disposal of chemical substances and mixtures that present unreasonable risk and/or injury to health or the environment.

Republic Act 7586 (National Integrated Protected Area System) — governs the classification and administration of all designated protected areas to maintain essential ecological processes and life-support systems, preserve genetic diversity, ensure sustainable use of the resources found therein, and maintain their natural condition to the greatest extent possible.

THE CRM PROCESS

CRM Process Overview



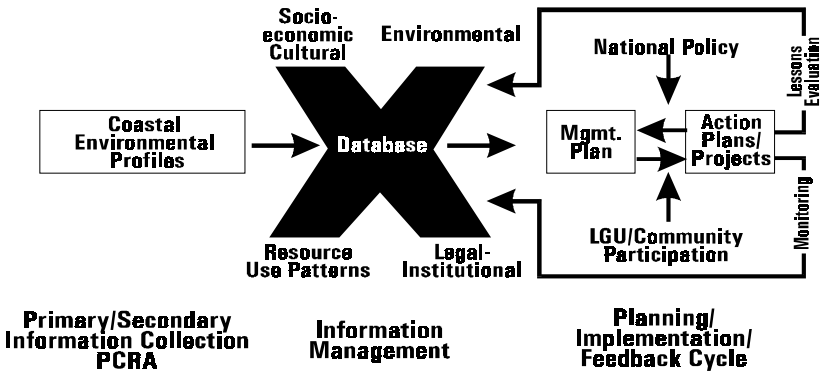
Coastal resource management (CRM) is the process of planning, implementing, and monitoring sustainable resource use through sound decision-making and collective action. It is a coherent, multi-sectoral and multi-disciplinary process within a legal and institutional framework that assures equitable involvement and participation in the use and management of coastal and marine resources. It is a dynamic process that combines the bio-physical, socio-economic, cultural and political aspects of the coastal environment to develop and implement a coordinated strategy for the allocation of these resources to achieve the conservation and sustainable multiple use of the coastal zone.

Increasing populations, along with rapidly advancing technologies, are making increasing demands on shrinking coastal and marine resources. An estimated 3.5 billion people, or about 63% of the total global population, live in the coastal region. Their sheer number and activities have resulted in increasing impacts on coastal ecosystems, thus impairing the ability of these ecosystems to replenish themselves and provide goods and services vital to sustaining human life. Already, a great number of coastal communities have been reduced to artisanal fishing and other subsistence activities, even as governments pursue development in the coastal zone to provide jobs and earn foreign exchange through mariculture, tourism, industrialization and mineral extraction. Clearly, there is a need to rationalize the use and development of coastal resources to ensure that not only are present human needs provided for, but also that coastal environments and habitats are adequately protected and managed so that development is sustainable and benefits the greatest possible number of people for the longest possible time. This is the primary goal of CRM.

The CRM process is facilitated by activities that promote community participation:

- Community Organizing
- Information, Education and Communication (IEC)
- Multi-sectoral Collaboration/Partnerships

A detailed diagram illustrating the CRM process is shown below:



CRM begins with the compilation of a coastal environmental profile for an area. This profile is used as a basis for planning and monitoring CRM interventions. After the profile is completed, the process moves on to a cycle of preparing and maintaining a database, planning, implementation, monitoring and evaluation. CRM involves a host of organizations from different sectors performing various roles, including:

Community
- Planning
- Project implementation
- Law enforcement
- Monitoring and evaluation

Non-government organizations
- Community organizing
- Training
- Research
- Education

Colleges and other academic institutions
- Education
- Research
- Networking
- Monitoring and evaluation

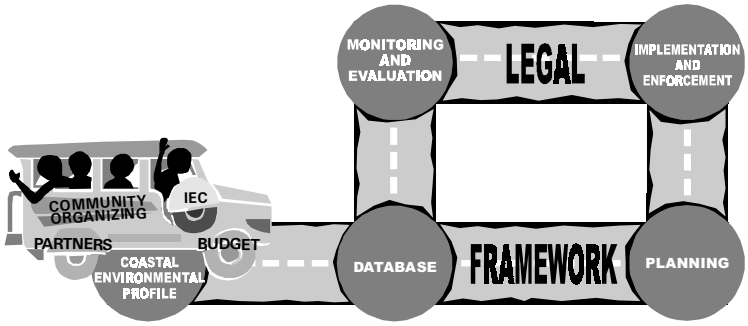
National government agencies
- Financing
- Technical assistance
- Training
- National policy reforms
- Research
- Monitoring and evaluation

Local government units
- Planning/local policy reform
- Law enforcement
- Infrastructure support
- Licensing
- Project implementation
- Linkaging
- Monitoring and evaluation

The CRM process is applied to space and time horizons appropriate to the area and resources that need to be managed. Spatial considerations include physical configuration of the shoreline and the presence of offshore inland and bays. Time horizons cover short-, medium-, and long-term planning goals.

To be effective, CRM must:
- be holistic, integrated and multi-sectoral in approach
- be consistent with, and integrated into, development plans
- be consistent with the national environmental and fisheries policies
- build on, and integrate into, existing institutionalized programs
- be participatory
- build on local/community capacity for sustained implementation
- build self-reliant financing mechanisms for sustained implementation
- address quality of life issues of local communities as well as conservation issues

THE CRM PROCESS
Coastal Environmental Profile
Overview



A coastal environmental profile is a document which presents secondary information as well as data gathered from the assessment of coastal resources in an organized and integrated form that can be used for CRM planning. The profile provides a baseline – that is, a starting point – for CRM planning and implementation, as well as for doing comparative analysis on "with" and "without" project scenarios. An outline for a comprehensive coastal environmental profile is shown below:

List of Tables and Figures
List of Acronyms and Abbreviations
Acknowledgments

I. Introduction
- A. location
- B. physiognomy or any short description of the area/geography
- C. historical background
- D. summary of issues
- E. objectives
- F. scope
- G. general definitions, if any

II. Physical Features *(data by municipality, with maps, tables and visuals)*
- A. land area
- B. topography
- C. hydrology
- D. soil
- E. land uses
- F. climate

III. Natural Resources *(including species, area, condition, with tables, maps and other visuals)*
- A. mineral resources
- B. coastal resources (description and maps)
  1. mangrove
  2. seagrass
  3. coral
  4. seaweed *(if present; may also be included in fisheries)*
  5. fisheries
  6. others *(beaches, endangered species, etc.)*
- C. forest resources

IV. Socio-political Setting *(with tables, charts, graphs, etc.)*
- A. political/administrative boundaries
- B. demographics *(by municipality)*
  1. population size, density, distribution, growth rate
  2. household *(number, members/nuclear or extended)*
  3. age and gender composition
  4. urban and rural distribution
  5. education
  6. dialects
  7. labor and/or employment, income
  8. religion and/or ethnic groups
- C. health, sanitation and medical care
- D. settlements *(type and ownership)*
- E. roads, transportation and communication, other related infrastructure or support systems *(e.g. cooperatives, fishing ports)*

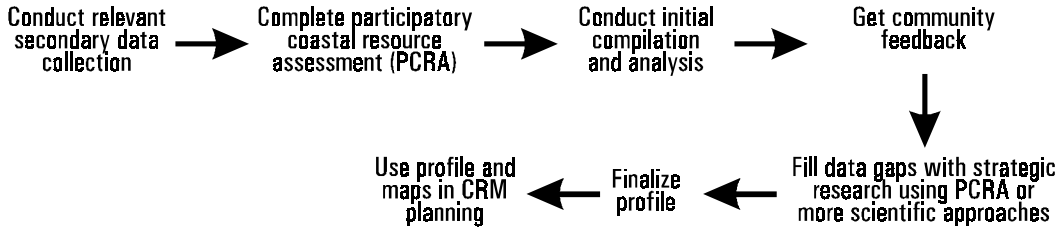
V. Economic Sector *(by municipality or barangay)*
- A. fisheries
  - 1. capture fisheries
    - a. capture methods *(fishing gear, type of boat and number, ownership)*
    - b. number of fishers
    - c. catch per unit effort
    - d. catch per species *(weight)* per gear
    - e. historical trends in catch levels and composition *(species caught, market value, production levels)*
  - 2. aquaculture
    - a. cadastral maps to depict fishpond areas by municipality/*barangay*
    - b. areas eligible for reversion
    - c. mariculture types and production levels by municipality/*barangay*
    - d. historical trends in production
- B. tourism
  - 1. classification and location of existing and potential tourist areas
  - 2. number of employees per activity
  - 3. revenues generated
  - 4. description of environmental, social, cultural impacts
- C. industry
  - 1. types of industry, location
  - 2. revenues generated
  - 3. number of employees by industry
  - 4. environmental, social, cultural impacts
- D. others *(e.g. agriculture, forestry; similar parameters as above)*

VI. Institutional and Legal Framework
- A. introduction
- B. current state of the Philippine Coastal Zone Law *(includes related policies/laws)*
- C. local government *(provincial, municipal, barangay, other government organizations)*
  - 1. types, structures
  - 2. budget allocated for CRM
  - 3. development plans/activities or projects
- D. non-governmental organizations involved in CRM
  - 1. names
  - 2. funding levels
  - 3. types of activities
  - 4. future plans
- E. community organizations *(similar parameters as above)*

VII. Management Issues and Opportunities *(include stakeholders and appropriate analyses)*
- A. environmental
- B. economic
- C. political/institutional

Like any management process, CRM requires planning and decision-making, which must be based on correct and timely information. Done well, a coastal environmental profile greatly facilitates – and is in fact essential to – formulating a CRM plan and implementing it. The basic descriptive information provided by profiles is useful, but the value of a good profile lies also in the compilation and analysis of the information it provides. One kind of information – for example, decreased levels of live coral cover – must be considered in relation to other kinds of information — for instance, low fish harvest and high siltation rates – to help ensure that the process results in meaningful conclusions which point to problems and opportunities for CRM. Often, ecological and other environmental factors must also be considered in association with socio-economic variables, thus providing useful conclusions regarding such factors as the conditions of various habitats, potential for fisheries production, and social constraints that hinder the CRM process. A profile produced using participatory coastal resource assessment (PCRA) methods – that is, with the resource users' participation — is particularly useful, since local resource users are more likely to consider in their planning decisions information that they helped generate than information that came from outside sources. If other stakeholders also had significant input, a profile can serve as the common reference for everyone involved in planning.

A profile should ideally be produced using a process that facilitates and encourages feedback from local resource users. A good general procedure is to conduct a preliminary analysis of the PCRA results and produce a draft profile for community, review, feedback, verification and correction, as shown in the flow chart below:



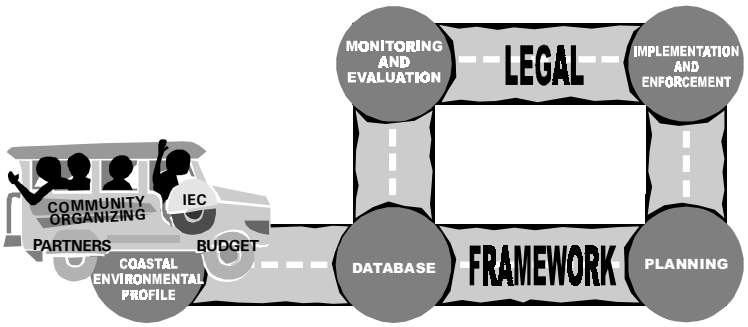
Data and information collected for the coastal environmental profile should be entered in a database. The municipal coastal databse can be used as a starting point for the coastal envrironmental profile.

Academic or research institutions can assist the community in gathering information on the biophysical status of the coastal environment.

THE CRM PROCESS

Coastal Environmental Profile

Secondary Data Compilation



"Secondary information" refers to information produced previously in some form of material medium – reports, planning documents, legal documents, maps, satellite images, photographs. Collecting such information is almost always the best way to start the production of a coastal environmental profile.

Documented information for CRM planning typically falls under two basic categories:

1. Government/institutional documents (ordinances, regulations, plans and other documents related to the legal CRM regime)
2. Scientific documents (studies in ecology and socio-economics; coastal environmental profiles)

Existing information materials are valuable. Often, a great deal of good quality information already exists, allowing the researcher to substantially reduce or redirect efforts in the preparation of the profile:

1. Government documents are important indicators of past and present government involvement or non-involvement in CRM. The information they provide is useful in identifying government management strategies and evaluating the success of previous and current government CRM activities.
2. Scientific studies provide information on the status of coastal ecosystems and the living and working conditions in coastal communities. For coastal resource assessment purposes, this information is considered "baseline," that is, a starting point in determining the long-term impact of CRM efforts.

Plans for coastal resource assessment efforts in the field should therefore be kept open until after an appraisal of existing documented information has been completed.

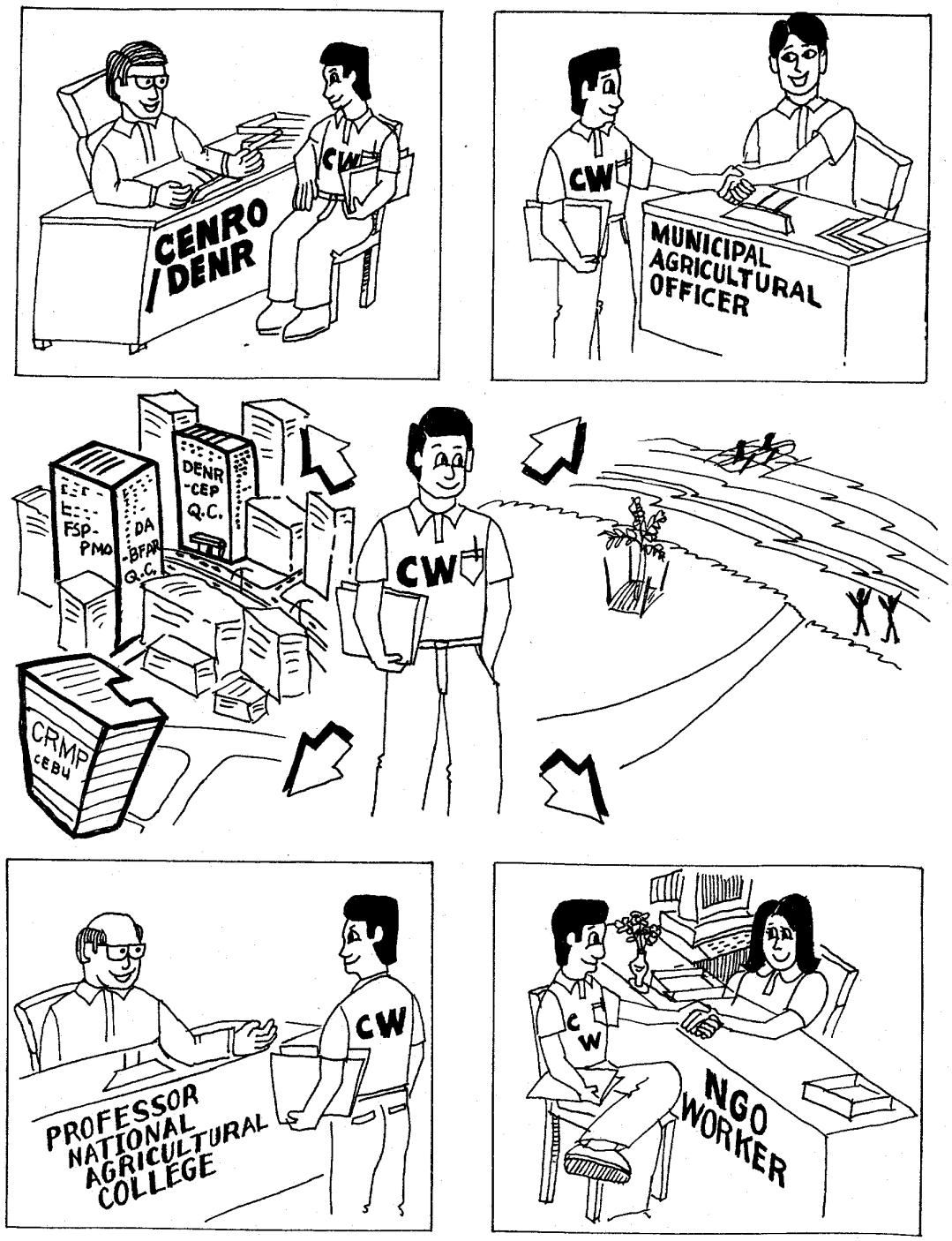
If a coastal environmental profile or similar document has not been produced previously, collecting existing documented information is usually not easy. Potential sources of information under general profile content headings are listed below:

General Project Indicator Type	General Profile Content Heading	Possible Information Sources
Environmental/ Ecological	Physical setting	DA, DENR, DPWH, universities, research institutions, NAMRIA,
	Climate	existing maps
	Oceanography	PAGASA, DA, DENR
	Important habitats	NAMRIA, PAGASA, MARINA, universities, research institu-
	Natural resources	tions DA, DENR, universities, research
Socio-economic/ Institutional/ Legal, Resource Users, Issues	Fisheries	institutions
	Other coastal resource users (tourism, shipping, etc.)	DA, DENR, universities, research institutions, museums DA, DENR, universities, research institutions, NGOs
	Local resource users	DA, DENR, DTI, universities, research institutions, NGOs
	Past and present CRM	DA, DENR, DTI, DSWD, universities, research
	Other stakeholders	institutions, NGOs
	Management issues and alternatives for develop-	RDCs, all involved government agencies, NGOs, LGUs
	ment,	RDCs, all involved government agencies, NGOs, LGUs
	monitoring and mitigation	RDCs, all involved government agencies, NGOs, LGUs
	Recommendations	RDCs, all involved government agencies, NGOs, LGUs

There is no detailed methodology for gathering information, which is mostly a matter of writing letters, making telephone calls, visiting offices and libraries, interviewing officials, teachers, scientists and researchers. The best strategy is to use the table above as guide, "leave no stone unturned," and always be vigilant for information from an unexpected source. Often, aid organizations sponsor planning, development and conservation projects and may be good sources of previous, ongoing or planned studies. Always keep a record of and reference the source of the secondary information. Although it may be difficult to track down all the existing information available, the mere effort is good for all concerned. In addition to gathering data, it allows the community worker to establish contact with other informants and experts who have something to offer the CRM process. The community worker might view the activity as contributing to the development of a broader definition of community, or institutional strengthening. In accomplishing this task, therefore, the community worker should have a twofold objective:

1. Gather extensive, good quality information (as practical – it is also critical to evaluate existing information and to use relevant and current but not obsolete reports or data).
2. Develop relationships with and between scientists, government and other stakeholders who can contribute to the CRM process.

(Adapted from: *Participatory Coastal Resource Assessment: A Handbook for Community Workers and Coastal Resource Managers, By J.S. Watlers, J. Maragos, S. Siar and A.T. White. CRMP, 1998)*



While gathering assessment information from a variety of sources, the community worker can simulataneously build professional relationships and facilitate institutional strengthening. (Adapted from: *Participatory Coastal Resource Assessment: A Handbook for Community Workers and Coastal Resource Managers, By J.S. Watlers, J. Maragos, S. Siar and A.T. White. CRMP, 1998)*