IMPLEMENTATION OF COASTAL RESOURCE MANAGEMENT (CRM) PROGRAM IN CALBAYOG CITY, WESTERN SAMAR

A Thesis

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of the Requirements for the Degree

Master in Fisheries Technology

Major in Aquaculture

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APPROVAL SHEET

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ABSTRACT

This study assessed the implementation of the Coastal Resource Management Program of Calbayog City, Western Samar in order to obtain data and information as a basis for improving its effectiveness and efficiency in CRM program implementation. The study is a descriptive survey of the coastal resource management program in Calbayog City, Western Samar for the purpose of obtaining data as a basis for improvement of its implementation geared towards effective and efficient coastal resource management. As to the relationship between the extent of implementation of CRM along with the different areas of concern and the profile of commercial fisherfolks, the result of the correlation coefficient and Fisher's t-value of 1.96 evaluated at 0.05 level of significance showed a significant relationship. The null hypothesis that there is no significant relationship between the extent of implementation of the CRM program and the profile of the commercial fisherfolks" was rejected. The production level in mariculture (seaweed and fish cage) is low compared to the regional average which could be attributed to the limited areas being utilized and the number of fisherfolk adopting the technology. Lower fish catch could also be attributed to extreme fishing pressure. In terms of CRM implementation, program implementers are more active in the area of fishery legislation and law enforcement and capability building which is evident in the evaluation described as "much implemented". Other areas of concern like establishment of protected areas, alternative livelihood, research, resource regeneration and enhancement, and public education were"moderately implemented". The problems

identified relative to CRM program implementation were in the area of fishery legislation and law enforcement, research, and capability building justified for lack of adequate funding.

TABLE OF CONTENTS

Chapter Page

Chapter Page

Chapter 1

THE PROBLEM AND ITS SETTING

Introduction

The management of the coastal and fisheries resources is a very important issue to deal with. The decline on the potential productivity of the major ecosystems to produce food and other benefits is very alarming. With the continued increase in population, the problem of food shortage, resource use conflicts, and access to resources have been aggravated. The problems on coastal resource management, however, are not just the sole responsibility of the government. Non-government organizations, the academe, private institutions and fisherfolks are considered key actors crucial to ensure that the coastal zone will continue to provide goods and services vital for sustaining quality of human life.

The coastal resources of the Philippines are among the richest and most diverse in the world. About 2,300 species of fish, 488 species of corals, and 29 species of true mangroves have been identified in the web of ecosystems along the country's 18,400 kilometers coastline which is considered one of the longest in the world. There is every reason to expect a bountiful harvest from such abundant resource base. And indeed, the sea is generous. In the early days, fish could be made to jump into boats by merely slapping the flat of oars against the waters. However, the current generation of fishers, retains only memories of a

time when their fishing forays do not have to go so far or risk so much (Vitan, 2001: 90). Most nearshore fisheries are overfished with extraction rates two to three times above sustainable levels. Of the three to four million hectares of coral reefs, about 70 percent are in poor to fair condition due to destructive fishing practices and siltation. An estimated 70 percent of the original mangrove forest of the Philippines have been lost from 500,000 hectares in 1918 to only 120,500 hectares in 1994 (Primavera, 2000 and Maneja, 2006). Burgonio in 2007 also states that the present mangrove coverage in the Philippines has risen from 112,000 hectares in 1998 to 290,000 hectares due to massive reforestation activities.

This situation is of grave concern to coastal communities and coastal managers, as the seacoast is where majority of people live and work. More than 80 percent of the country's population resides within 50 kilometers of the coasts of the main islands. Over exploitation of the coastal areas is worsened by rapid population increase. Many of them are migrant landless agricultural workers because access to coastal resources is open and at least guarantees survival (Ferrer, et al., 1996: 1).

The Philippines, with one of the highest population growth rates in the whole of Asia, is likely to face a dramatic fall in the supply of locally-produced fish in the next few years. Currently, this is a home to almost 90 million people with an average annual rate of population growth of 2.75 percent over the past century, now around two percent according to United Nations estimates.

Records show that in 2007, the country's per capita fish consumption of fish is recorded at 38 kilograms per person per year (Philippine Fisheries Profile, 2007: 8).

Without any change in fish consumption and no active human population management program, the World Bank Report warned domestic demand for fish will reach 3.2 billion kilograms by 2020, given the projected population growth rate of the country. If increase in demand is met solely by marine capture fisheries, such increased pressure on this sector could lead to an eventual collapse of the fisheries and the fishing industry which employs more than one million people (about 5.00 percent of the national labor force) (Tacio, 2008: 2).

The importance of fisheries to food security cannot be overstated. Fish provide approximately 50.00 percent of the animal protein among Filipinos. In most coastal communities, up to 80.00 percent of the animal protein requirement maybe supplied by fish caught in municipal waters. And yet, national food security programs of the government rarely consider fishery resources in the inventory of stable, sustainable, and predictable food supply. At best, this is surprising considering the importance of fish in supplying the highest quality and most efficiently produced dietary protein in the world (Courtney, et al., 1998: 4).

Managing the coastal resources as a government function started by responding specific problems such as coastal erosion or shoreline use. This approach was clearly inadequate, given the complexity of the resources and the

issues involved. By the mid 80's, the concept of comprehensive management of inter-linked coastal resource system gained acceptance among government managers. The adoption of Agenda 21 in Rio de Janiero in 1992, particularly Chapter 17 on the protection of the oceans and the seas boosted this approach worldwide. As part of this global development, numerous coastal resource management laws and policies were issued in the Philippines in the 1980's. However, these laws touted as the most comprehensive set of environmental laws in Asia are generally hobbled by weaknesses in the implementing institutional system. Often they are contradictory and few are not enforced adequately. Their biggest drawback is that they were drafted largely as a response to signs of decline in the fishing industry and were therefore directed at maximizing fishery production rather than managing fishery resources (Vitan, et al., 2001: 92).

To reverse the decline of municipal fisheries production, immediate action must be taken to change the open access regime in the country. Medium and long-term measures also must be taken to rehabilitate coastal ecosystems to achieve a stable, predictable, and sustainable source of the most nutritious and economical protein available today - fish and other edible marine plants and animals (Courtney, et al., 1998: 4-6).

Samar is one of the richest areas of the country in terms of natural resources. The island is the site of the biggest nature reserve in the country which is the Samar Island Natural Park (SINP). Its marine waters are one of the most

productive fishing areas in the Philippines. Not surprisingly, fishing is one of the main sources of livelihood of the people of Samar.

Calbayog City, on the other hand, is situated along the western coast of Samar and plays a major role in the management of Samar Sea. Its territorial waters has an area of 465.15 square kilometers and a total coastline of 70.89 kilometers (NAMRIA). It is a home to 3,907 municipal and commercial fisherfolks (CCCDMP, 2003: 124).

Fish production in Samar Sea is steadily declining and the rate is accelerating. It declined by 19 percent from 1983-1994 and 50.00 percent in the last three years from 1992-1995 (Vitan, 2001: 98). Although fish stocks and catches are still considered abundant, municipal fisheries have to exert effort now and go farther out into the sea. The coasts off Calbayog City are the richest in the area in terms of quality mangroves, corals, and seagrass beds. However, mangrove areas are fast being converted into urban settlements and rapid siltation is evident in the estuaries (Vitan, et al., 2001: 98). The decreasing fish yield as a result of overfishing and too much fishing pressure lead to increased poverty among coastal families and fisherfolks. The poverty incidence of families in Western Samar is 40.70 percent with a poverty threshold PhP13,517.00 the amount required to satisfy food and non food basic needs (NEDA, 2006).

Having a great number of fisherfolks that are dependent on the bounty of Samar Sea, the city government is carrying all the burden. It is not enough that illegal fishing activities will be mitigated and resources are restored back. More

so, the poverty issue must also be addressed particularly the fishers in the coastal barangays. The fishery resources of Calbayog are more than a million worth of alternative livelihood. All it needs is a more responsive, appropriate and doable mainstreamed policy on coastal resource management.

Hence, it is along this line that the researcher has considered it timely to assess the coastal resource management program of the city, its extent of implementation, and its issues and constraints in order to come up with a clearer picture of the overall situation. The vital information derived from this study will serve as important inputs to the formulation of policies geared towards a more responsive coastal resource management endeavor.

Statement of the Problem

This study assessed the implementation of the Coastal Resource Management Program of Calbayog City, Western Samar in order to obtain data and information as basis for improving its effectiveness and efficiency in CRM program implementation.

Specifically, it seeks to answer the following questions:

1. What are the personal and demographic characteristics of the municipal fisherfolks, commercial fisherfolks, barangay officials and technologist and department managers in terms of:

1.1 sex;

1.2 age;

1.3 civil status;

1.4 educational attainment;

1.5 length of experience related to CRM;

1.6 trainings attended related to CRM, and

1.7 average monthly income?

2. What projects of the Coastal Resource Management Program are being implemented in the different barangays of the City of Calbayog from 2006-2009 in terms of:

2.1 types of project;

2.2 location where the projects implemented;

2.3 other data relevant to projects implemented, and

2.4 profile of municipal and commercial fishing activities?

3. What is the extent of implementation of the CRM program as perceived by the municipal fisherfolks, commercial fisherfolks, barangay officials, and technologist and department managers in relation to;

3.1 public education;

3.2 capability building;

3.3 fishery legislation and law enforcement;

3.4 resource regeneration and enhancement;

3.5 establishment of protected areas;

3.6 alternative livelihood, and

3.7 research?

4. Are there significant differences on the perceptions of the different groups of respondents on the extent of implementation of CRM Program in the City of Calbayog in relation to the different areas of concerns?

5. Is there a significant relationship between the extent of implementation of CRM Program in Calbayog City and the following:

5.1 profile of municipal fisherfolks;

5.2 profile of commercial fisherfolks, and

5.3 profile of technologists and department managers?

6. What are the problems encountered and to what extent are they felt by the different groups of respondents on the various areas of CRM Program implementation?

7. Are there significant differences on the extent to which the problems are felt by the different groups of respondents on the implementation of the CRM program in Calbayog City?

8. What measures could be undertaken in order to improve the implementation of the CRM program in the City of Calbayog?

Hypotheses

Based on the questions proposed in the study, the following hypotheses were formulated:

1. There are no significant differences on the perceptions of the different groups of respondents on the extent of implementation of CRM Program in the City of Calbayog in relation to the different areas of concerns.

2. There is no significant relationship between the extent of implementation of CRM Program in Calbayog City and the following:

2.1 profile of municipal fisherfolks;

2.2 profile of commercial fisherfolks, and

2.3 profile of technologists and department managers.

3. There are no significant differences on the extent to which the problems are felt by the different groups of respondents on the implementation of the CRM program in Calbayog City.

Theoretical Framework

The study is anchored on the theory of sustainable development stressed by the Bruntland Commission (1987) which advocates the delivery of the environmental, social, and economic services to all residents of the community without threatening the viability of the natural-built and social system upon which the delivery of these services depends. It furthermore states that sustainability is achieved when the needs of the present generation are satisfied without sacrificing or compromising the ability of future generation to satisfy their wants and aspirations as well.

The Local Agenda 21 Initiative (ICLEI 1990) supports, that the sustainability of all life is dependent upon the global ecosystem. If this system is disrupted and its resources are consumed more quickly than they can be replenished or when it is burdened by more wastes than it can absorb, the potential of the ecosystem to support human communities will be reduced. Sustainable development stresses balancing of human needs with the carrying capacity of the environment.

Likewise, Section 16, Article II of the 1987 Constitution of the Republic of the Philippines explicitly provides that "the state shall protect and advance the right of the people to a balance and healthful ecology in accord with the rhythm and harmony of nature."

Republic Act 8550 also states that "it is the policy of the state to achieve food security as the overriding consideration in the utilization, management, development, conservation, and protection of fishery resources in order to provide the needs of the population. It is also the policy of the state to manage fishery and aquatic resources, in a manner consistent with the concept of an integrated coastal area management in specific natural fishery management areas, appropriately supported by research, technical services, and guidance provided by the state".

The study is likewise anchored on the systems theory which is concerned with the interconnectedness of the science, rather than a continued isolation and specialization. Scientists sought understanding of the whole by understanding

all of its parts (The whole is represented by the sum of its parts) (Bertalanffy, 1969). Assessment, analysis, or diagnosis simplifies and studies the individual parts of a whole.

Coastal resources are important assets that should be managed properly by the Local Government Units (LGU's) and their communities. The Local Government Code (Republic Act 7160) is one of the most radical and innovative legislations which decentralized a considerable number of functions and responsibilities to the local government units (municipal and provincial). The Code puts the local government units at the forefront of fisheries management within the 15-kilometer limit of the coastal waters. They are mandated to implement laws for the majority of activities that influence the terrestrial and coastal marine zones. Under this Code, legislative powers are exercised through their respective local legislative councils.

The Local Government Code likewise emphasizes the role of LGU's with regard to sharing responsibility with the national government for the management and maintenance of ecological balance within their respective jurisdictions. After all, among government units, it is the LGU that is closest to the people and has the authority to shape and reshape policies on resource utilization (Muñoz, 2002).

Recognizing the need to involve the local government units as well as the coastal communities in the management of coastal resources, the Fisheries Code supports the creation of Fisheries and Aquatic Resource Management Councils

(FARMCs) at the national, regional and local levels. The three levels of the management councils are the National Fisheries and Aquatic Resource Management Council (NFARMC), the Municipality/City Fisheries and Aquatic Resource Management Council (MFARMC/CFARMC), and the Integrated Fisheries and Aquatic Resource Management Council (IFARMC) (Muñoz, 2000).

The Code of Practice for Responsible Fisheries (FAO, 1995) provides principles and standards applicable to the conservation, management and development of all fisheries. It also covers the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management.

Conceptual Framework

The schema in Figure 1, conceptualizes the entire study. It takes into account the important components in order to attain the expected outcome of the study. The study looked on projects and activities as well as on the status of the coastal resource management program implementation in Calbayog City Western Samar in the areas of public education, capability building, alternative livelihood, legislation and law enforcement, establishment of protected areas, resource regeneration and enhancement, and research. How these areas of concerns of the program are being perceived by the different groups of respondents were assessed.

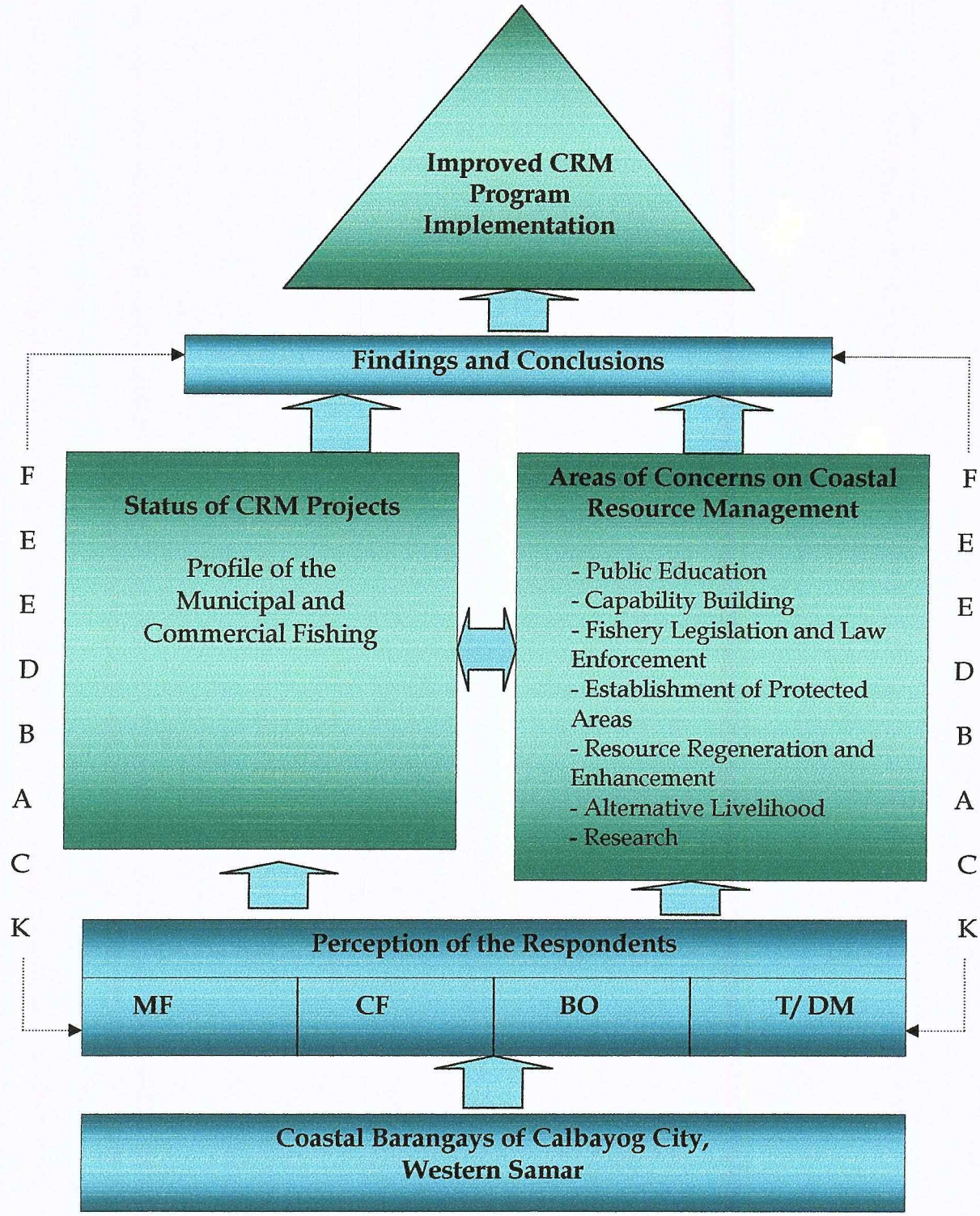

Figure 1. Conceptual Framework of the Study

The data gathered as a result of the study were analyzed and used for the formulation of measures and strategies to improve the coastal resource management program implementation of the city of Calbayog towards efficiency and effectiveness.

Significance of the Study

The study was undertaken with the end view of assessing the activities of fisherfolks in the coastal areas of Calbayog City as well as the extent of the implementation of the CRM benefiting program planners, law enforcers, extension workers, department managers, stakeholders, researches, and students.

Program planners. The output of the study would provide insights to formulation of policies geared towards making coastal resource management a top priority and mainstreamed in all its programs.

Law enforcers. The findings of the study would provide a guiding framework and for them to improve community compliance with the laws, rules, and regulations on fisheries and coastal resource management.

Extension workers. The findings of the study would improve their technical competence and application of the various coastal resource management theories, concepts and processes vital in the delivery of technical services in their respective fields and service areas.

Department managers. The result of this study would provide them inputs in making smart plans and wise decision-making relative to management of resources as well as in setting the right goals and direction for effective and efficient coastal resource management program implementation. The researcher believes that this particular study would provide insights for leaders of the city of Calbayog to prioritize coastal resource management in order to address poverty in the coastal communities and eventually address environmental issues and problems.

Stakeholders. The findings of the study would equip them the knowledge, skills, and abilities to participate, and be involved in any way in the coastal resource management process from data gathering, planning, implementing, monitoring and evaluation.

Researchers. The result of the study would give them the challenge to investigate and discover new strategies and approaches of coastal resource management practices and implementation.

Students. This study would serve as their reference/ guide and a good source of literature for research particularly in the field of coastal resource management.

Scope and Delimitation

This study focused on the extent and status of implementation of the Coastal Resource Management (CRM) Program of Calbayog City, Western

Samar on the areas of Public Education, Capability Building, Fishery Legislation and Law Enforcement, Resource Regeneration and Enhancement, Establishment of Protected Areas, Alternative Livelihood and Research from years 2006-2009. More particularly, this includes the 34 coastal barangays namely; Carayman, Bagacay, Aguit-itan, Obrero, Capoocan, Matobato, San Policarpo, Sabang, Basud, Cajumpan, Cagsalaosao, Tomaligues, Salhag, Tinambacan Sur, Tinambacan Norte, Bante, Malajog, Malopalo, Marcatubig, Bantian, Manguinoo, Binaliw, Baay, San Joaquin, Cagnipa, Cagolango, Peña, Malayog, Cagmanipis Sur, Cagmanipis Norte, Malaga, Tinaplacan, Bugtong, and Caglanipao Sur (Figure 2). These areas can be reached by land transportation facilities or by water as the case maybe.

The respondents for this study consisted of four groups, namely: 1) municipal fisherfolks (363); 2) commercial fisherfolks (102); 3) barangay officials (170); 4) technologists and department managers (14). The content of the study is limited to the following: personal and demographic characteristics of the respondents, projects on CRM being implemented and the profile of municipal and commercial fishing activities, extent of coastal resource management program implementation as perceived by the four groups of respondents, and problems encountered and its extent to which these are being felt by the respondents. This study was undertaken during the school year 2009– 2010.

Figure 2. Map showing the locations of the study

Definition of Terms

For purposes of clarity, the terms used in this study are herein defined. Unless otherwise documented, these definitions are the researcher's formulation to suit their use in this particular study.

Active gear. This refers to fishing gears which are characterized by gear movement like dredging, towing, lifting, encircling, and surrounding fish. As used in this study, it refers to destructive fishing gears like trawls, purse seine, and ring net.

Alternative livelihood. It refers to the means, activities and entitlements by which people make a living. In this study, it refers to an income generating project funded by the local government unit given to fisherfolk beneficiaries.

Artificial reefs. These refer to any structure of natural or man made materials placed on the body of water to serve as shelter and habitat, source of food, breeding areas for fishery species and shoreline protection (DAO, No. 3, 1998). As used in the study, these refer to the structures made up of used tires and concrete materials installed in the coastal zones of Calbayog City for resource regeneration and enhancement.

Assessment. It refers to measuring certain aspects of the environment or socio economic condition in the community (IIRR 1998). In this study, it refers to the determination of extent of implementation of the CRM Program in the City of Calbayog, as well as determining the problems and their extent in relation to CRM program implementation.

Calbayog City. A city created through Republic Act No. 328 otherwise known as the Charter of the City of Calbayog which was signed into law on July 15, 1948 by then President Manuel A. Roxas (www.wikepedia.com). For this study, this refers to the chartered city where the 34 barangays involved in the research are located.

Capability building. This means empowering the community through education, training and organizational development. Environmental or conservation education is a critical part of the capacity building. It helps to build a common understanding of the often complex and interrelated aspects of CRM. By emphasizing local issues, environmental education can build awareness and skills that contribute to the capacity of individuals and communities to effect change (IRRR, 1998: 20). In this study, it refers to the activities undertaken by government agencies to improve the level of awareness, knowledge, and competencies of stakeholders in CRM program implementation.

City. As used in the study, it refers to Calbayog City, Western Samar.

Coastal resource management. This refers to those activities that achieved sustainable use and management of economically and ecologically valuable resources in the coastal areas which consider interaction among and within resource system as well as those of human and their environment. It is also referred to in various quarters as coastal management (CM), coastal zone management (CZM), coastal area management (CAM), integrated coastal zone management (IZCM), and community based coastal resource management (CB-

CRM) (Allan White, Nelson Lopez, 1991) (DENR, DA-BFAR, DILG, and CRMP 2001). As used in the study, it refers to the program implemented in the City of Calbayog aimed for the protection, management, and conservation of the coastal resources. CRM as used in the study refers to Coastal Resource Management.

Coastal zone. It refers to a band of dry land and adjacent open space (water and submerged land) in which terrestrial processes and uses directly affect oceanic processes and uses and vice versa. Its geographical extent may include areas within landmark limit of one kilometer from the shoreline at high tide to include mangrove swamps, brackish water ponds, nipa swamps, estuarine rivers, sandy beaches and other areas with a seaward limit of 200-m isobath to include coral reefs, algal flats, seagrass beds, and other soft bottom areas (RA 8550: 165). In this study, it refers to the areas of Calbayog where the CRM Program was implemented.

Coastal communities. This refers to groups of people that lives on the edges of the bountiful sea but are generally poor, crowded and marginalized. However, they are resourceful when resources are degraded, they may lack monetary resources but they survive (IRRR, 1998: 5). In this study, these refer to the 34 barangays of the City of Calbayog which are involved in the research.

Coastal resource. These are the living and non-living things found below the surface of the sea (IRRR, 19989: 4). As used in the study, it refers to the aquatic fauna and flora found in the waters of Calbayog City.

Commercial fishing. The taking of fishery species by passive or active gear for trade, business or profit beyond subsistence or sports fishing to be further classified as: small scale commercial fishing-fishing with passive or active gear utilizing fishing vessels of 3.10 gross tons (GT) up to 20 GT; medium scale commercial fishing- fishing utilizing active gears and vessels of 20.10 GT up to 150 GT and, large scale commercial fishing- fishing utilizing active gears and vessels of more than one hundred fifty.

Commercial fisherfolks. These are persons who are directly or indirectly engaged in commercial fishing. For this study, it refers to commercial fisheries respondents.

Department managers. As used in the study, it refers to Heads of Sections of the City Agriculture Office, Philippine National Police, Philippine Coast Guard, Maritime Industry Authority, Department of Environment and Natural Resources, and City Government in-charge of the implementation of Coastal Resource Management Program of the City of Calbayog.

Educational background. This refers to the highest grade or level of education completed (BFAR/BAS, 2002: 25). For this study, this means the levels of education of the respondents as to elementary, secondary, college, and graduate studies.

Education and training. In this study, it refers to seminars, orientation sessions, skills enhancement activities, fora, and formal discussions to increase

the level of awareness of stakeholders and raise the consciousness of the community on coastal resource management.

Establishment of protected areas. It means the protection of certain areas within the coastal zone and maintaining them in their original and natural state. Some types of protected areas are fish sanctuaries, marine reserves and marine parks. In this study, it refers to areas in the city waters declared as marine protected areas and fish sanctuaries.

Feedback. As used in the study, this means the responses of the respondents on the extent of the implementation, problems encountered, as well as their recommendations on the implementation of the coastal resource management program of the City of Calbayog

Fisherfolks. It refers to people directly or permanently and physically engaged in taking and or culturing and processing fishery and aquatic resources (Department of Agriculture Administrative Order No. 3, 1998). In this study, these refer to the 363 municipal fisherfolks and 102 commercial fisherfolks respondents involved in the study.

Fishery legislation and law enforcement. It means the formulation of ordinances, laws, rules and regulations that seek to protect and conserve coastal resources and bring about their sustainable management. For this study, it refers to local fisheries ordinances use as legal basis for apprehension activities.

Implementation. It refers to the execution of the plan, project and target activities.

Livelihood intervention. This refers to the income generation projects provided to communities as a source of additional income. For purposes of this study, this refers to seaweeds culture, milkfish culture in cages, long line and fish/squid pot fishing, and other income generating activities related to fisheries aside from fishing.

Law enforcement. It refers to ensuring obedience to the laws. It usually invokes the image of uniformed officers arresting people, often through application of force. It involves application of a broad range of approaches by different institutions as well as coastal stakeholders (DENR, DA- BFAR, DILG, and CRMP, 2001: 5). In this study, this refers to the activities related to CRM being undertaken by Philippine National Police, Philippine Coast Guard, and the Maritime Industry Authority.

Management. It means planned rational and wise use of land and water and all their resources and values in a sustainable long term manner so as to obtain the maximum benefits with the minimum impacts which are kept within tolerable limits (UNESCO, 1996). In this study, it refers to the activities undertaken for the effective implementation of the CRM Program in the City of Calbayog.

Mangroves. These mean an individual or whole forest of salt-tolerant tree species found along tropical coasts and valued economically for fuel wood, pharmaceutical properties, and construction materials. Mangroves serve as feeding, spawning, and breeding grounds for many commercially important

specie (IIRR, 1995: 76). As used in the study, it refers to flora of the Genera Avicennia, Sonneratia, and Rhizophora.

Marine sanctuary. This refers to a zone in a protected area where fishing activities of any kind and gathering of any marine organism are strictly prohibited and where historical and cultural features are preserved either by law or by traditional practices (IIRR, 1998: 63). As used in this study, it refers to specific marine protected areas or fish sanctuaries established in Barangay San Joaquin and Tinambacan Norte established in 2009 and 2007 through City Ordinances 2009-01-083 and 2007-10-050.

Monitoring. This refers to the routine gathering and reporting performance data (both input and output) against measures of expected performance (UP-ISSMI, 2005: 56). As used in the study, it refers to one of the activities in CRM program implementation more specifically on capability building, establishment of protected areas, and alternative livelihood.

Municipal fisherfolks. This refers to persons who are directly or indirectly engaged in municipal fishing and other related fishing activities.

Municipal fishing. This refers to fishing within the municipal waters using fishing vessels of three gross tons or less, or fishing not requiring the use of fishing vessels.

Passive gear. These are fishing gears that have no gear movement or without mechanized tools. They are stationary, fixed and not destructive. As

used in this study, they refer to gill net fish corral, longlines and other rudimentary types of gear.

Program. This refers to the set of interrelated projects or planned activities to meet pre-determined objectives within a specified time frame (Webster,s Encyclopedic Dictionary, 1002:799).

Project. This means any activity that involves the use of one or more scarce resources during a specific time period for the purpose of producing socio-economic return in the form of goods and services (UP-ISSI, 2005: 6). As used in the study, it refers to specific activities undertaken in the various areas of concerns of the CRM Program.

Public education. This is a means of communicating with people and motivating them to change their values, beliefs, and behavior in ways that are more compatible with sustainable use of the resources.

R.A. 8550. It is the Philippine Fisheries Code of 1998. It is an act providing for the development, management and conservation of the fisheries and aquatic resources, integrating all laws pertinent there to and for other purposes. In this study, it refers to the national law.

Research. It refers to the process of gathering data or information to solve a particular or specific problem in a scientific manner (Calderon and Gonzales 1993: 3). In this study, this refers to one area of concern of CRM program implementation being assessed.

Resource regeneration and enhancement. It refers to activities whereby people aid or speed up the process of environmental recovery. In this study, this refers to mangrove reforestation, aqua-ranching, stocking and re-stocking of communal waters, installation of artificial reefs, coral transplantation, sea grass transplantation and re-seeding of depleted areas.

Samar Sea. This refers to the body of marine waters within the Philippine archipelago, between the Eastern Visayas and Luzon. It is bordered by the islands of Samar to the east, Leyte to the south, Masbate to the west, and Luzon to the north. The sea is connected to the Philippine Sea to the north via San Bernardino Strait, to Leyte Gulf to the southeast via San Juanico Strait, to the Visayan Sea to the southwest, and to the Sibuyan Sea to the northwest via Masbate Pass and Ticao Pass and adjacent to Biliran Island (www.wikepedia.com). For this study, this refers to the marine waters where Calbayog City is located.

Stakeholders. It refers to the individuals of group involved, interested in or impacted (positively or negatively) by coastal resources and their uses. These may include members in the community, local fisher folks, local business sector, NGO's representative of government agencies and others (DENR, DA-BFAR, DILG and CRMP 2001: xii). As used in the study, these refer to fisherfolks, barangay officials, technologists, and department managers who are involved in CRM program implementation.

Sustainable development. It refers to the management and conservation of the natural resources base and the orientation of technological and institutional change in such a manner to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development conserves land, water, plants and animals genetic resources, is environmentally non-degrading, technically appropriate, economically viable, and socially acceptable (Csavas, 1995: 8).

Technologists. This means persons who are specialists in a branch of science of technical processes (Webster's Encyclopedic Dictionary, 1992: 1015). As used in the study, these refer to the six Agricultural Technologists (ATs) of the City Agriculture Office of Calbayog City, who are professionals who undertake development activities to alleviate the living conditions in a community. They are the "front-liners" or direct implementers of the program/project of CRM. In addition, they disseminate and promote current and appropriate technologies envisioned to embark greater influence on cost reduction, productivity, and profitability.

Trawl fishing. It is an active fishing gear consisting of a bag shaped net with or without otter board to open its opening which is dragged or towed along the bottom or through the water column to take fishery fish species by straining them from the water, including all variations and modifications of trawls (bottom, mid-water, and baby trawls) and tow nets.

Chapter 2

REVIEW OF RELATED LITERATURE AND STUDIES

The chapter presents the different related literature and related studies relevant to the study with brief and concise explanation of the result and resemblance to the present study.

Related Literature

According to Pomeroy and Carlos (1997), as cited by Fernandes (1998: 221), the Philippines has long history of indigenous fisheries and resource management systems where the barangays had jurisdiction over natural resource use and access. This has been documented by various researchers (Lopes, 1983; Ferrer, 1989; Garrity et al., 1993; Pomeroy and Carlos, 1996). The management system was self –regulated and decentralized and decisions on resource use, access, and control are consensus-based and are enforced through social sanctions. The management of the coastal zone varied from the senior fisher-led scheme to territorial use rights in fisheries (TURF) system. Such management schemes are usually complimented by the richness and relevance of indigenous knowledge that helps promote sustainable development and ecological consciousness (Magos, 1994: 243). Indigenous management regimes, however, were not promoted by the colonial government under Spain and the United state since they are not based on formal and legalized guidelines but on customary,

cultural tradition and the local knowledge of the living and non-living environment.

The Spanish policy on the use and disposal of the new colony was guided by the legal theory of the "Regalian Doctrine" which postulated that all lands especially those without land titles or deeds of ownership, belonged to the colonial state. In essence, indigenous laws and land claims were ignored and the native of the archipelago were converted into the property-less majority. The Spanish colonial experience in turn, set the stage for the subsequent legal framework and management of the public domain, including land minerals, water, flora and fauna.

Similar to the policies of the Spanish colonial regime the Unite State government adopted a centralized system of resource management where municipalities were given the power to profit and grant fishing privileges through an elite- led municipal council (those who can run for an elective post at that time where limited to the propertied and educated few). The Regalian Doctrine provided the legal justification for the new colonial claim to ownership of 27,694,500 hectares, or 92.30 percent, of the total Philippine land mass (Lynch 1990: 271) and all bodies of water within its jurisdiction. Land and water resources were designated as public domain and, as in the Spanish era, its ancestral character was not recognized.

According to Siason (1998), coastal or municipal fisheries answer for 34 percent fish production (BFAR, 1997), a steady decline from previous levels, e.g.,

41.3 percent in 1992. The government had taken full cognizance of this declining trend only in the nineties, when it advocated emphatically for the management and sustainability of coastal resource through the involvement of different stakeholders. Prior to this development the national thrust was to increase fishing effort through improved capture technology and the provision of credit, as measures to increase productivity. However, such approaches further depleted the fish population and degraded the marine environment. Similarly, research effort was directed at determining biological limits of stocks, carrying capacities of water bodies and of economic valuation of coastal resources, which did not seem adequate to address the problems facing the sector.

Repeatedly, the need to incorporate into the analysis the contribution of the social science has been invoked. This should entail an improved understanding of the socio-economic conditions of the fishers and their households, their perceptions and attitudes, which influence their behavior as major participants in the fisheries sector

Income from municipal fishing is below the poverty line (PhP13,517.00 per month according to NEDA 2008: 8), influenced by the seasonality of the occupation and the competition over an open resource. Municipal fishing tends to be seasonal in nature because it is affected by monsoon winds, the Habagat (southwesterly) and Amihan (northeasterly).

Fishers chose to remain in fishing despite its non-profitability because of the low opportunity costs of their labor. It has also been observed that the sea is

perceived as the last frontier for those who cannot make a living in the land. Thus the landless and displaced workers will try fishing, where there is the notion that one can get lucky and have a plentiful catch.

Community-Based Fisheries Management (CBFM) is an effective and fair management system. It is also beneficial to economic administration and makes monitoring and enforcement more effective than the central government system. Fisheries community based management leads to responsibility and awareness building of fishermen as the resource owner which brings about longer utilization of resources. Awareness building on the obedience of rules and regulation which are regarded as a part of community culture would be useful for individual fishermen as well as the community as a whole. CBFM also provided an opportunity for communities to develop strategies of management which are consistent with the community conditions and need because fisheries communities are regarded as mechanism and tool management measures which is more acceptable and easier to monitor and evaluate. CBFM is a method which fully utilizes traditional local knowledge and skill so that basic resource information can be used together with biological information in management. Moreover, the method can reduce social conflict and keep society in the communities united (Boonchuwong, 1998: 69).

Coastal Resource Management is best accomplished by a participatory process of planning, implementing and monitoring of sustainable uses of coastal resources through collective action and sound decision making. Community-

based or co-management approaches to coastal resource management are based on the principle of evolving local coastal communities in managing the resource upon which they depend (White, et al., 1994 and ICCM No. 4, 2001). Accepted wisdom says the process must be participatory, that is it must be consultative, multi-sectoral and interdisciplinary. It must consider the interconnectedness of the various ecosystems. It must encourage cooperation among individuals, among communities, and among countries. It must, in other words, be rooted in the truth that we all share one coastline and one ocean. Because of the complexity of the coastal environment and the many issues that must be addressed, coastal management must be integrated across habitat and includes land - based activities that affect the coastal zone, as well as integrated among government units and sectors (DENR, 2001: 4-5).

In the report of Coastal Resource Management Project (CRMP) Completion Report 1996-2004, they have adopted a coastal resource management planning process for Philippine local government units. It consists of five phases covering the entire coastal resource management cycle, namely: Phase I - Issue Identification and Baseline Assessment; Phase II -Coastal Resource Management Plan Preparation and Adoption; Phase III - Action Plan and Project implementation; Phase IV - Monitoring and Evaluation, and Phase V - Information Management Education and Outreach (CRMP, 2004: 56).

Bersales (1996 as cited by Ferrer, et al., 1996) documented the coastal resource management experience in Eastern Samar. This was implemented in

seven municipalities, namely: Guiuan, Mercedes, Salcedo, Geporlos, Quinapondan, Balangiga, and Lawaan with Guiuan Development Foundation Incorporated (GDFI), a local nongovernment organization (NGO) as the lead implementor. The start of the program revolved around livelihood activities such as seaweeds culture and offshore fishing using "payao" or fish aggregating device. This was followed by the establishment of a marine reserve. The community organizing efforts of the foundation resulted in the formation and strengthening of fishers' cooperative. This was also used as a strategy to advance coastal resource management through establishment of marine reserve areas and resource regeneration like seeding of giant clams, wing oysters, sea cucumber, abalone, tronchus, and other gastropods. Mangrove reforestation was likewise undertaken to enhance its poor resource base of the marine reserve. This was all done in Bagubanua Island in Guiuan. PCAMRD in 1993 conducted a survey of the marine reserve in Bagubanua. Results showed that coral cover increased by 25.00 percent since its declaration. Population of marine vertebrates and invertebrates had increased in number. The success has been attributed largely to the fishing ban in the area and the active participation of communities and nearby residents in protecting the marine reserve. This also led to the declaration of more marine reserves in seven municipalities covered by the program. In partnership with the Department of Agriculture, a marine hatchery and research station was established. The hatchery has successfully spawned

three giant clam species and was expected to supply fishing communities with juvenile marine organisms for seafarming and restocking of overexploited reefs.

In 2001, Vitan documented the community based coastal resource management experience in Samar Sea. It was implemented in Tagapul-an, Almagro, Sto. Niño, and Calbayog City. This was spearheaded by the Center for Empowerment and Resource Development (CERD), a national nongovernment organization (NGO). CERD believed that development should be people-centered and that people should own their development. Furthermore, people whose lives, survival, and development are dependent on the coastal resources should be vested with power and responsibility in the management of projects on CRM. As direct dependents of coastal resources coastal communities, they should have a direct interest in reversing unsustainable systems and practices by, instead of conserving and protecting, ensuring sustainable resources use. CERD employed the general community organizing process. Within a year of setting up community - based organizations (CBOs), capacity building for fish stock and habitat assessment and management were accomplished intensively. Other capacity-building activities focused on organizational management, ranging from documenting basic organizational principles and basis of unity, on-the-job training (OJT) in conducting meetings, detailed planning, and resource assessment activities.

Sustainable fisheries component echoes their organizing strategy. Capacity building for fishery resource management is focused on near-shore

stocks and habitats. Standard activities were employed like the deployment of artificial reefs, regeneration and protection of habitats, preparation for marine reserve establishment, and maintenance of protected areas. In 2000, Tinambacan Fisherfolks Federation (TFF) was established and inter-barangay cooperation had been initiated among community - based organizations in Almagro. Their objective was to facilitate the necessary inter-barangay coordination and gain political and resource support something that smaller organizations would otherwise find difficult to obtain.

CERD employed a variety of advocacy towards sustainable fisheries. These include using mass media and working with resource management council to advocate Fishery Management Plan (FMP). Tinambacan Federation participated in elections not by endorsing and campaigning for candidates, but by requesting all candidates to sign a friendly fisheries agenda. The importance of socio economic development as a component helps organized fishers in Samar Sea identify their needs and determine how to meet these, such as finding credit sources where necessary. Gender analysis was also undertaken to further deepen understanding of the situation of coastal resources, coastal communities, and the fishing industry. Upon their request, women are organized into separate groups to ensure a social space that they can own. Ensuring women's participation in community level programs and activities and developing their leadership capabilities became key concerns. Gender sensitivity also became a

standard component of capability building in both women and men organizations.

In 2004, the coastal zoning project of the city government of Calbayog was among the top 10 winners of Galing Pook award. The project was among the 172 entries nationwide, 87 from Luzon, 42 from Visayas and 43 from Mindanao. The number of entries was narrowed down to 22 projects after a rigorous selection process which includes ocular inspection and site validation. One feature of the project is what the city mayor called the "winwin solution" to resolve the dispute between the commercial fishers and municipal subsistence fisherfolks through the establishment of"Fishing Highway". This is the area eight kilometers from the shoreline where commercial fishing operation is allowed despite a law banning commercial fishing to operate within the 15 kilometers from the shoreline (Gadaingan, 2005: F-3).

The development of community-oriented values and the raising of critical consciousness of the fisherfolks and other stakeholders consist primarily of training and seminars. In terms of attitudinal knowledge and development, orientation on community based-coastal resource management, environmental awareness, gender sensitivity, and value formation are provided to key players in resource management. More specific skills are developed through the expansion of training programs with courses on community organizing, leadership, organizational management, cooperative management, feasibility study, and conflict management. Study tour and exposure trips to similar

project are also done to replicate management strategies applicable to respective areas (Gutierrez, et al., 1996: 83)

Nightingale (2003:70) states that public education as a strategy is the key in making fisheries management work. If people are involve and aware, and have the capacities and the background information, the impact of implementing fisheries management is more effective and productive.

Gauran (1996: 23) documented the organizing experience of the Network Foundation, Incorporated (TNFI) in the implementation of the Fishery Sector Program in Panguil Bay, Northwestern Mindanao. He states that the community organizing effort of the program focused primarily on capability-building of fisherfolks and other stakeholders. Knowledge and skills in planning, organization building, mobilization, value formation and cooperativism were enhance through a series of training, education-information campaigns, cross-site visitation, seminars and workshops with fishers and local officials.

According to Nightingale (2003: 65) participatory processes are undoubtedly sound ways of implementing coastal resource management strategies. However the capabilities of the resource managers must be build and developed for them to be involved in decision making. It does not matter if the resource managers are the fisherfolks or the non-government and government individuals their capability must be developed.

In the province of Misamis Occidental, members of the cooperative regardless of gender were deputized as fish wardens. They conducted patrols

within their respective municipal waters and apprehended fishers engage in destructive forms of fishing. Filing of charges against the violators deterred other fishers from using illegal fishing practices. Others volunteered to stop using their destructive fishing gears particularly the organized fishers, upon the insistent demand of the residents, the department of agriculture and the local government units (Gauran, 1996: 33).

As in any other forms of legislation on fisheries laws and regulation, there are difficulties in the implementation of gear restriction. The experience of Environmental Legal Assistance Center (ELAC) in Honda bay, the community initially appreciated the hulbot-hulbot fishing due to the benefits it gives to them by giving fish buyers low fish price from the operators and making profit out of it. However, in just three months they experienced the effect of commercial fishing intrusion in the bay. The fish catch of the small fishers dwindled drastically particularly the hook and line fishers. After many consultations and mobilizations, the communities banded together and succeeded in getting hulbot-hulbot operators out of the bay (ELAC, 2003: 83).

Cogtong Bay has a large mangrove area. Nearly 2,000 hectares were classified as timberlands. About 700 hectares have been released for fishpond development or illegally cleared for that purpose. The remaining 1,300 hectares remained intact but needed a management program to sustain them. Reforestation activities included areas at the outer edge of existing mangrove stands extending 50 to 100 meters seaward and to some areas illegally cleared for

fishpond development. The primary species were the bakawan (Rhizophora spp.) Other species were Tabigi (Xylocarpus granatum) and api-api (Avicennia spp.). Areas technically suitable to mangrove reforestation and the management were delineated for project clients.

Concrete artificial reef "x" module were deployed in the site. These were constructed by the fisher-participants with materials provided by the project. The concrete artificial reef modules were less expensive per cubic meter of the reef volume than the commonly used bamboo. They were also considered to be more practical because they were relatively long lasting. A total of 265 modules were deployed in the bay which was designated as artificial reef zone (Janiola 1996: 49)

The first marine protected area (MPA) in the country established as a fish sanctuary was in 1974 at Sumilon Island in Cebu under the supervision of Siliman University Marine Laboratory (Alcala, 1981). Sumilon Island Fish Sanctuary is often cited as the reason why coral reefs in fish sanctuaries contributed to improved reef fisheries management (White, 1987: 372). This experiment in reef management, that stopped all fishing activities in a portion of Sumilon Island Reef for about 10 years, allowed researchers to collect substantial data on the effect of such management effort on the coral reef and its related fisheries (Alcala 1988; Alcala and Russ, 1990). The benefits provided compelling evidence for fish biomass spill over from no-take areas. Such evidence had been important in convincing scientists, reef managers, and fishers that fish

sanctuaries improved reef fisheries while benefiting fishers in the area (Russ and Alcala 1996; Russ, et al., 2003, 2004 as cited by White, et al., 2006).

Case studies from around the country revealed how coastal management program has evolved under different conditions to address local issues that possessed a number of similarities across locations. The role of barangays, municipalities, cities, and provinces was essential in every instance for long - term success of integrated coastal management intervention because they provided the primary government presence in coastal areas. In the 1980's most projects focused at the community and barangay levels to establish small marine protected areas (White, et al., 1994; Ferrer, et al., 1996; White, et al., 2002). Those still operating today in Negros Oriental (Apo Island), Bohol (Balicasag and Pamilacan Island), Zambales (San Salbador Island), and Batangas (Mabini Marine Reserve) have illustrated the value of empowering communities to manage their coastal areas and resources through their own initiatives and with legal and institutional supports from the barangays and the municipalities (White & Vogt, 2000; Christie, et al., 2003a, 2003b; Oracion, 2003; Russ, et al., 2004). These small projects provided lessons that are now reflected in larger Integrated Coastal Management (ICM) programs (ADB, 2003). Their strength was the relative success in protecting and enhancing nearshore habitats and fisheries for the benefit of the coastal communities. Marine tourism had also been attracted to these marine protected areas and had contributed to the local

economies through employment, management and tourism activities, user's fees, and visitor spending (White and Rosales, 2003).

According to Heinen (1999: 13) fisheries management in some form or another was already practiced even before people learned to write. It developed traditionally in certain areas of the Pacific as a response to overfishing because when there is overfishing, people inevitably start thinking about management. People are alerted to the overfishing issue because there must be some kind of monitoring going on. Still this does not complete the requisites for fisheries management to take place. There must also be communication. Fishers have to communicate with each other about overfishing and the experiences they have about the stock. If these three elements are present – overfishing, monitoring, and communication, then fisheries management can develop.

He also identified five types of overfishing: 1) Economic overfishing- this happens when there is increasing fishing intensity. The more fishing activity undertaken the more fish can be caught. If fishing intensity is increasing so is the fishing cost (more labor, materials, capital, fuel, etc.). At one point total cost meets total catch and are equal. 2) Recruitment overfishing - if we fish on stock with such intensity that the parent stock is no longer capable of producing normal stock the next year, then we are faced with recruitment overfishing. For example, there are very few spawning lobsters in a certain area and cannot produce enough eggs for the next generation. 3) Growth overfishing - the catching of fish at a size that is not at its most profitable stage presents a problem

of growth overfishing. This usually happens when fishers use fine-meshed nets where fish are caught before they reach juvenile stage and mature first before they are harvested. 4) Ecosystem overfishing - is related to recruitment overfishing wherein anything and everything in the sea are harvested. Some species are extinct but another species replace. 5) Malthusian overfishing - happens when there are more mouths to feed than what the environment can support. Because limited resources cannot support increasing number of people there should be fewer people.

Tacio (2000: 1) identified factors that affect the condition of Philippine coral reefs. He stated that destructive fishing methods are destroying vast areas of reefs. Fishers blast reefs with dynamite, stunning if not killing fish several meters away. A single blast can make a hole up to five meters in diameter in branching coral colonies with long-term effects. Heavily-dynamited reefs produce only 2.7 to five metric tons per square kilometer per year compared to 30 metric tons for healthy reefs. The damage caused by dynamites to reefs goes beyond the shattering impact of the explosion itself. After a blast, algal growth quickly smothers the coral because the shoals of grazing fish that would normally keep it under control have been decimated.

In many parts of the world, natural poisons have long been used in fishing without apparent damage. In the Philippines, 80.00 percent of the exotic fish destined for pet shops and aquariums throughout Europe and North America are captured using cyanide. There is also a growing demand in upscale

restaurants for live food fish which are often caught with cyanide. The annual trade in aquarium and live food fish is worth at least US$1.2 billion wholesale, says Dr. Vaughan Pratt as cited by Tacio (2008: 3). Cyanide also kills coral polyps and the symbiotic algae and other small organisms necessary for healthy reefs.

Another equally destructive fishing method is the "muro-ami" which was introduced by Okinawan fishermen before World War II. This fishing gear is a drive-in net used for fishing in coral reefs. It consists of a net bag with two long wings into which divers drive schooling fish. The gear utilizes vertical scare lines weighed down by stones or chain links for creating a disturbance that drives out the fish from the coral reef into the net.

Coral mining has also depleted the country's reefs. In fact, an estimated 1.5 million kilograms of corals are harvested annually as part of the international trade in reef products. The Philippines, supplies more than a third of this total with Malaysia, Indonesia, New Caledonia, and Fiji supplying another third. The biggest demand comes from the United States which has banned domestic coral mining. In 1989, the United States also banned the importation of coral from the Philippines (where its export is illegal); however, supplies continue to arrive through illicit channels and from Indonesia and Singapore.

In recent years, the phenomenon called "bleaching" has also threatened the country's sensitive coral reefs. From 1997 to 1998, massive coral bleaching in which corals turn chalky white was reported in Masinloc, Zambales; Bolinao,

Pangasinan; Bacuit Bay, El Nido; Coron Islands in Palawan, and Puerto Galera, Oriental Mindoro. The whitening of corals is caused by the loss of zooxanthellae, an organism found in the tissue of polyps (a tiny flower-like animal connected by a membrane that covers the coral rock) exposing the coral's calcium component and usually causing its death. Experts traced the recent mass bleaching to global warming. An increase in temperature of at least one degree can cause coral bleaching. With the continued temperature increase in the world's oceans, bleaching is inevitable.

Also contributing to the destruction of coral reefs in the Philippines are sedimentation from erosion of soil from deforestation, the quarrying of coral reefs for construction purposes, pollution from industry, mining, and coastal population growth. On land, the ecosystem that supports the greatest number of plant and animal species is the rainforest. In the sea, it is the coral reefs. Most of the coral reefs are located in the regions bounded by Indonesia, Malaysia, and the Philippines. About 600 of the 700 species known to man have been discovered in this region.

Depending on their location, reefs have been damaged directly through harmful practices such as coral mining, fishing with dynamite and cyanide, or overfishing in general, haphazard coastal development, or even careless pleasure diving by tourists. Reefs have also suffered indirectly from sediment from inland deforestation and removal of coastal mangroves, from industrial pollution, and

from nutrient pollution contributed by sewage, fertilizers, and urban runoff (Tacio, 2008: 8).

The decline of mangroves from up to 500,000 hectares in 1918 to only 120,500 hectares in 1994 may be traced to overexploitation by coastal dwellers and conversion to settlements, agriculture, salt beds and industry (Baconguis *et al.*, 1993; Primavera, 1995 as cited by Primavera, 2000). Mangrove rehabilitation should follow biophysical criteria, e.g., planting along seaward coasts of pioneering species of *Avicennia* and *Sonneratia,* rather than the mortality-prone *Rhizophora* , popularly used for fuelwood and fishing poles and easily available (because of large propagules produced year-round). Priority should be given to islands most vulnerable to the 20-30 typhoons that visit the archipelago yearly. In this connection, the greenbelt or buffer zone requirement of 20-50 meters along riverbanks and 50-100 meters facing open seas and other laws protecting mangroves should be strictly enforced and violators be charged in courts. Aquaculture operators can be encouraged to use their ponds more efficiently if fees are increased to capture economic rent and to provide funds for mangrove rehabilitation.

Mangrove-friendly aquaculture and mangrove management projects should be promoted in the context of a wider integrated coastal zone management (ICZM) that coordinates the needs of various sectors: fisheries, aquaculture, forestry, industry, etc. and should be community-based in

cognizance of the role of local residents as users and day-to-day managers of coastal resources (Primavera, 2000).

According to Muñoz (2000: 187), there are 16 seagrass species recorded in the Philippines. The country placed second only to Western Australia among the 27 countries of the Indo-Pacific Region. Extensive seagrass beds have been identified in Bolinao, Palawan, Cuyo Island, Cebu, Bohol, Siquijor, Zamboanga and Davao. Seagrass communities in the country manifest signs of degradation due to the combined effects of natural calamities, predation, aquaculture, deforestation, siltation, and destructive fishing methods.

She also stressed that like coral reef, mangrove and seagrass communities, and seaweed beds play vital roles in the coastal environment. There are 190 species of seaweeds recorded in the Philippines. About 150 species are considered economically important but only a few are cultivated. Of particular importance is *Eucheuma* spp. To date, the Philippines is the world's second largest supplier of *Eucheuma*, producing about 7.5 percent of the total world supply of 8.6 million metric tons. There are about 80 000 seaweed farmers with 350 000 dependents that rely on the seaweed industry in the country (Muñoz, 2002: 99).

On its report, the Coastal Resource Management Project-Philippines (1996-2004) states that all Local Government Units notice changes in both the biophysical condition in the coastal resources as well as the socio economic status of the coastal residents. These changes were observed by most local government

units through technical and formal monitoring and assessment reports, personal testimonies from coastal resource management implementers and observations from residents. Perceived socio-economic results include increase in fish catch for small fishers in most coastal resource management certified local government units, as well as benefits from other livelihood activities. Much improved participation of community groups and residents was cited as a positive spin-off on coastal resource management planning and implementation. This was noted to result in improved stewardship of coastal resources, particularly coral reefs, mangroves, and nearshore fisheries. Improved compliance with the law was another commonly stated outcome. This is particularly true when the Local Government Unit has a formally - organized law enforcement team.

A positive impact of having an initially successful CRM program was that LGU's found additional opportunities for funding and technical assistance more readily. This has encouraged some to expand their CRM programs to focus on sustainable financing through eco-tourism and user's fee among other approaches to continue their programs (CRMP, 2004: 95).

According to White, *et al.* (2006: 296), several emerging trends in the Philippines are realigning the requirements for national institutional policy and framework in support of coastal management. The first is that integrated coastal management is replacing the emphasis on fisheries development and narrowly based habitat management of past projects, thus emphasizing the need for improved integration and collaboration. This trend is also moving towards a

more ecosystem-based management approach that brings fisheries into the center focus (Green, et al., 2004 as cited by White, et al., 2006).

The second trend is that local government units are assuming more responsibility for and allocating resources to manage municipal waters and coastal resources compared to their past dependence on national government (CRMP, 2004). This trend is encouraging national agencies to redefine their roles to provide technical assistance to local governments as opposed to taking the lead in resource management. Finally, a multi-sectoral collaboration is becoming essential to solve the complex and deeply embedded coastal resource management problems that exist because of increasing population poverty, scarce resources, and lack of accessible alternatives.

These trends are encouraging although much remains to be done to ensure the sustainability of the integration of integrated coastal management into local governance in the country. Integrated coastal management is rapidly expanding because of the urgent need to manage and protect the valuable coastal resources that occurs along the country's extensive and diverse coastline. In response to this, various multinational and bilateral donor projects have and are supporting various forms of coastal management endeavors. Although there are many successes in the implementation on these projects at a local scale and in short-term range, many lack a full consideration of what is required to become sustainable beyond project life (White, et al., 2006: 298).

Tan (2003: 63) reported the provision of alternative livelihood project to fisherfolks in Daram, Samar as part of the coastal resource management to alleviate poverty. The fishing gear dispersal project consisted of providing the fisherfolk beneficiaries with non-motorized bancas and pressurized gas lamps for squid jig fishing and panels of gill nets to catch mackerel for gill net fishing. These were to be repaid in a scheme where the fishers' organization itself would collect and manage the funds. For the marketing and credit project the fisherfolks created a socio economic committee mandated to buy the fish catch of the members. When fishers started using their own fishing gear their income significantly increased. This was partly due to their marketing project which bought the members catch at a much higher price than those of the middleman.

According to De Guzman (2004: 89), across Southeast Asia fisherfolks are finding it harder and harder to land the catches they need. Overfishing, habitat destruction and marine pollution have significantly damaged fish stocks and fish breeding grounds throughout the region. In an attempt to reverse this decline, many countries have set up marine protected areas. The idea behind such project is twofold: not only are the reserves meant to provide a safe haven for fish and other marine flora and fauna to breed and flourish, they are also meant to help surrounding fishing areas recover by seeding surrounding waters with fresh fish stock. De Guzman carried out this study and looked at the Baliangao Protected Landscape and Seascape Reserve. The study showed that the establishment of the marine protected area had significant positive effects on the

overall ecological conditions of both Baliangao Marine Reserve Area and some of the reefs outside it. In comparison to the years following the establishment of the marine reserve, he found improved live coral cover, mangrove diversity, and increase in fish diversity and population. A number of related findings gave further strong indications that the marine protected area had positive impacts on the surrounding fish stocks and fisheries. Observation of fish movement found that large adult food fish such as emperors, rabbitfishes and snappers frequently moved out of the sanctuary core. It was also found that juvenile population of important food fishes inside the sanctuary was almost certainly the source of young fish caught outside the reserve. In addition, an economic analysis of fish catches in the region showed that without the marine protected area people would get zero return from fishing, again pointing to the importance of the reserve in keeping fish stocks viable.

Related Studies

Some studies that showed similarity to the present study were the following:

Cebu, et al. (2003) conducted an assessment of fish habitats and estuaries in Lao-ang, Northern Samar. The objective of the assessment was to determine and identify important fish ecological habitat and to evaluate their status. The findings revealed that coral reefs in the area were in a very poor state with only 5.00 percent live coral cover. Seagrasses had fewer fish and other associated

organisms that lived with it. Mangrove was the only habitat considered healthy and had recovered from human extraction and utilization over the past years. Fish stocks were depleted due to use of fine-meshed nets.

It was recommended that the municipality of Lao-ang, Northern Samar should enact a comprehensive municipal fisheries ordinance to implement resource enhancement projects and activities, provide alternative livelihood projects, and provide education and trainings among stakeholders to advocate protection and management of coastal resources.

Diocton, et al. (2005) conducted a rapid coastal resource assessment in San Jose, Northern Samar to identify important key habitat for enhancement and protection from further deterioration. The assessment was conducted using scuba gear (line-intercept method) to determine coral cover. Fish visual census was also conducted to determine variety of fish species present. Seagrass identification and ocular survey on mangrove forest to determine mangrove cover were also done. Results showed that live coral reef cover in the area had fair condition (50.00 percent live coral cover). Sea grasses have relatively few associated fish species. For the past eight years mangroves had recovered from wanton destruction. It had an estimated forest cover of 369.118 hectares. The average density of standing mature trees increased from 547 in 1996 to 1,030 in 2004. The use of fine-meshed nets in river banks caused depletion of fish stocks, particularly fish species that thrived in estuarine areas. Mud crab resources

were also decreasing due to the absence of appropriate management measures to mitigate over-exploitation.

The study of Cebu, et al. in 2003 and the study of Diocton, et al. in 2005 are closely related to the present study since both aimed to assess the status of the fisheries and coastal resources of San Jose and Lao-ang, Northern Samar as basis to come up or develop management measures that will ensure the sustainability of the fisheries and coastal resources. However, the former studies differed from the current study because the current study attempted to evaluate the extent of coastal resource management program implementation of Calbayog City, Western Samar in order to formulate measures to effectively and efficiently improved CRM program implementation of the City. More so, it also aimed to determine constraints and problem in the implementation of CRM projects.

In 2003, the Bureau of Fisheries and Aquatic Resources with the Food and Agriculture Organization (FAO) of the United Nations under the Project FAO/EP/GLO/201/GEF conducted a study on Juvenile and Trash Fish Excluder Device (JTED) in Maqueda Bay and Samar Sea. They used three types of devices: sorting grid 1, 1.5, and 2 cm (SG); rectangular shape window (RSW), and semi-curved window (SCW) attached to the trawl net to determine the escapement rate of these devices. The results showed that SG2 with the largest bar spacing (2 cm) obtained the highest escapement rate of juvenile fish and unwanted catch fish species with 52.10 percent. The rate of escapement in the JTED variation was influenced and in direct proportion to the size and spacing of

the grid. It can be noted that among the sorting grids SG1, SG1.5, and SG2, the rate of escapement became distinct in terms of juveniles caught. SG2 indicated about 80 percent of the juveniles were able to escape (Dickson, et al., 2003).

This study is related to the present study because it was conducted at the site where the study was conducted. The present investigation differed from the previous as it aimed to assess the extent of coastal resource management implementation while the former aimed to test the effectiveness of the device to release juveniles and unwanted fish species, and to mitigate the negative impact of trawling.

In 2006, the Bureau of Fisheries and Aquatic Resources Central Office in Manila conducted a two -year similar study on Juvenile and Trash Fish Excluder Devices (JTED) in Samar Sea. It used three types of JTED sorting grids made of stainless iron rod attached to the bunt of the trawl net: horizontal sorting grid with 1.5 centimeter distance opening (H15); vertical sorting grid with 1.2 centimeters opening (V12), and vertical sorting grid with 1.5 centimeters opening (V15). Twelve commercial trawls were involved. Fishing effort was controlled, each trawl fishing outfit was given five fishing trips per month. Each trawl used all devices and changed one device to another every month. The objective of the study was to determine which of the three devices was appropriate in terms of escapement rate and the adoptability or acceptability of the device as a responsible fishing technology. The results showed that JTED was a viable tool in fisheries management. V12 and H15 were practical devices to reduce

unwanted catch or rejects and the exclusion of juvenile fish species. Fishing effort control systems worked well and found useful.

The study is related to the current study because it attempted to introduce a management tool relevant to the management of the fishery resources. Moreover, it is also related in the sense that Samar Sea, the site of the study was also the target area of the present investigation.

Rosales (2004) conducted a study about "Fishing Practices in Selected Fishing Villages in Calbayog City". His finding revealed that fishers were using different types of fishing gears. Modern active fishing gears like trawls, and traditional passive fishing gears like gill net and fish barriers were used by the respondents. As to fishing practices, fishers employed both legal and illegal methods of fishing which resulted in decreased volume of fish catch among small fisherfolks, as well as the depletion of the coastal resources. He recommended that the city government should provide alternative livelihood projects to fisherfolks to lessen fishing pressure and mitigate overexploitation of the resource base.

The study of Rosales is closely related with the present study for it attempted to assess the fishing practices in selected fishing villages of Calbayog City. However, the present study differed from the former for it assessed the extent of coastal resource management program implementation of the city of Calbayog. In addition, the present study aimed to assess problems and constraints in the implementation of coastal resource management programs.

In 2006, Cebu, et al. conducted a rapid community and coastal resource assessment in Daram, Samar. The assessment covered identification of existing community organizations, coral reefs, mangroves, and seagrasses. Findings revealed that out of 57 coastal barangays, 31 were registered community organizations and some 26 organizations nonregistered. The community organizations actively worked on environmental issues, poverty alleviation, social services, and advocacy. To address environmental issues, the organizations focused on marine life preservation, protection of fish sanctuaries, and mangrove reforestation.

The resource assessment conducted further revealed that relatively few coastal areas in Daram had good coral cover from 51-75 percent live corals. This can be found in the eastern side of the island. A total of 18 species of mangroves have been identified in all the 23 mangal sites. Wide mangrove areas were noted along the southeastern vicinities of the island with an estimated total area of 167 ha. Seagrasses were also noted in the northern and western coastal areas of the island; however, they were observed in patches and have significant impact to fishes as their natural habitat.

This study is closely related to the present study for it attempted to assess the community and coastal resources. This differed from the current study for this study aimed to assess the implementation of coastal resource management programs in Calbayog City and to identify problems and constraints to improved coastal resource management program implementation.

In 2007, ADB-JBIC evaluated the CRM livelihood projects in Region 8. The team visited various projects implemented under Fisheries Resource Management Program (FRMP) in Region 8 and personally held dialogues with the beneficiaries of the projects. According to Mohammed Nasimul Islam who headed the five-man FRMP exit-audit team, in general, the goals and objectives of the Fisheries Resource Management Project were realized and successful in many places--most importantly in capacity building and understanding on coastal resource management (CRM) at the local government unit (LGU) level.

Mohammed Nasimul Islam also added that FRMP, which covered four bays which are: the San Pedro Bay, Sogod Bay, Ormoc Bay and Carigara Bay - encompassing 17 municipalities and 230 barangays in the three provinces of Samar, Leyte and Southern Leyte, was aimed to alleviate poverty and to stem the depletion of coastal resources by providing alternative livelihood to fisherfolk communities thru self-driven enterprises.

The annual report of the Bureau of Fisheries and Aquatic Resources Region 8 in 2007, posted a fish sufficiency level of 148 percent, which was 18 percent higher than the previous year (134 percent in 2006). All three sectors, the municipal fisheries, commercial fisheries and aquaculture exhibited increased in production. The biggest contributor was the municipal sector registering an upsurge of 12.00 percent compared to 2006. This sterling performance was attributed to the mariculture areas that have been established region-wide. The commercial fisheries sector also grew by 10 percent despite

very high prices of fuel and spare parts. The total fish production in Eastern Visayas was pegged at 191,409 metric tons.

Duzon (2003) conducted a study to assess the extent of farm management practices of fish farmers in brackishwater aquaculture in selected towns and city of Samar, particularly in Calbayog City, Sta. Margarita, Paranas, Sta. Rita, Villareal, Jiabong, Motiong, Calbiga, Pinabacdao, Tarangnan, San Sebastian, and Pagsanjan as perceived by the fish farmers themselves and fisheries technologists. The findings of the study revealed that fish farmers lack technical trainings and not aware of the existing modern technologies in aquaculture, hence the important activities in pond management necessary to ensure high survival of stocks and higher productivity was never attained. He furthermore stated that the number of technicians to provide technical assistance on appropriate aquaculture technologies were inadequate. Thus, this justified the claims of the fish farmers of their low farm productivity. Moreover, the major problem identified was the lack of financial resources of fish farmers for fish farm development. The researcher recommended that curricular offerings of fisheries institutions be strengthened in order to produce competent human resources responsive to the needs of the aquaculture industry.

This study has similar bearing with the present investigation considering that both studies included Calbayog City as its locale. More so, that the brackishwater farms which have been assessed are part of the coastal ecosystem wherein it contributed a significant impact on the management of the coastal

resources, more particularly on the conversion of existing mangrove areas into fishponds. Appropriate aquaculture technologies were likewise adopted by the fisherfolks in the different barangays of Calbayog City. Finally, the effectiveness of technology transfer of appropriate aquaculture technologies to alleviate socio-economic conditions of fish farm operators was likewise assessed. However, the present study differed from the previous one because its main focus is on the assessment of CRM program implementation in the City of Calbayog in relation to the different areas of CRM. Also, the present study involved fisherfolks, technologists, barangay officials, and department managers while the previous study only involved the fish farmers and technicians.

Amparado (2005) in his dissertation entitled "The Aquaculture Industry of Samar Province: Proposed Fishery Extension Program for Samar State University (SSU)" aimed to determine the extent of farming practices in freshwater aquaculture, brackish water aquaculture, and mariculture, technology delivery system, training needs and problems in the aquaculture industry. This was conducted within 25 municipalities including Calbayog City. His finding revealed that in mariculture two major crops are being raised by the fish farmers. These are the green bay mussel and grouper. Out of 148 fish farmers practicing the technology, 66.37 percent were engaged in green-bay mussel farming and 33.63 percent were engaged in grouper cage culture. As to the extent of farming practices, the study revealed that in mariculture the respondents assessed that these technologies were moderately practiced. He concluded that one of the

problems which hindered fish farmers to practice this technology is the lack of capital to shoulder the cost of production.

He emphasized that aquaculture be given preferential attention by various government agencies particularly the Bureau of Fisheries and Aquatic Resources and the local government units to ensure food security in the province. Furthermore, the implementation of a functional extension program to affect technology transfer through collaborative efforts of the government agencies, nongovernment organization, and the academe is of primordial concern. Finally, the study recommended that a credit line and loan opportunities at low interest rate with simple terms and conditions be accorded and adequately provided to fish farmers to address their requirement for working capital through proper representation of the concerned authorities and agencies to financial institutions and business organizations.

This study is related to the present study since both involved mariculture technology which is also one of the areas being assessed by the present study. Moreover, Calbayog City is one of the sites where the study was conducted. The relevance of the study is also viewed from the standpoint of the need to assess the status and extent of intervention of the government in the delivery of technological, sociological, and economic services toward development and sustainability of the coastal resources.

This study differed however from the present study since the former aimed to assess the aquaculture industry of the Samar Province while the present study assessed the CRM program implementation of Calbayog City.

Mañoza (2004) in his study on "Social Consequences of Fish Sanctuary and Marine Protected Areas in the Management of Marine Ecosystem in the Southeaster Part of Samar Sea" reported that there were 16 fish sanctuaries and marine protected areas in the southeastern part of Samar Sea. These were located in Catbalogan, Daram, Zumarraga, Motiong, Tarangnan, Talalora, and Calbayog City. Results showed that the measured output expressed as social consequences of the establishment of fish sanctuary in the area contributed significantly in terms of improved socio-economic conditions of the fishermen, increased catches, and better living opportunities, better technology transfer, more gender participation, empowerment of fishermen in resource management, and values formation of the people. However problems and constraints encountered include illegal fishing, intrusion of other fishermen who were not involved and immediate beneficiaries of the fish sanctuary, and reduction in fishing areas. The study of Mañoza is closely related to the present study since both dealt on areas of concerns of coastal resource management as well as similarities of study sites. Moreover, problems and constraints on its establishment and implementation of activities were both assessed. However, the previous study differed from the present study since it involved municipalities aside from the city of Calbayog. In addition, the previous study

focused on fish sanctuaries and marine protected areas which were only an area of concern of CRM Program undertaken in the present study.

In 2009, Diocton studied the Population Dynamics of *Noctiluca scintillans* and the Red Occurrences in Maqueda Bay through a spectral analysis the low, medium, and high spectrum using fourier transformation. The study reveals that during the month of December to the early part of summer in 2008 and 2009 the density of *Noctiluca scintillans* reached to about ten cells per cubic meter, indicating the peak of its reproduction. He concludes that as the population density of *Noctiluca scintillans* increases or as growth reaches near its maximum peak of the low spectral part, red tide will occur. He further concluded that the maximum peak low spectral part of *Noctiluca scintillans* could be used in predicting red tide occurrence.

This study is related the present study as red occurrence affect the economic activity of the fisherfolks and *Noctiluca scintillans* is an indicator of its occurrence. This study however differs from the present on the basis that it focuses primarily on the occurrence of *Noctiluca scintillans* and red tide, while the present study deals on the assessment of the status of resource regeneration and enhancement projects, protected areas and livelihood projects as part of CRM project.

Doncillo in 2009 conducted a study about Value added Products From Low Cost Minced Fish. Her study aims to develop value added product from low cost fish into different products like fish nuggets, fish balls and fish patty.

Results show that different products formulated out of the low cost fish were rich in protein, palatable and very much accepted as human food. She concluded that by catch fish species considered to have low market value can be transformed into a convenient food item. Value adding could contribute and will provide opportunity for diversification of the fish processing industry.

Chapter 3

METHODOLOGY

The chapter presents the discussions of the methods and procedure involved in the study. It contains the research design, respondents, sampling procedure, instrumentation, data gathering, and statistical treatment t used in the data analysis.

Research Design

The study is a descriptive survey of the coastal resource management program in Calbayog City, Western Samar for the purpose of obtaining data as basis for improvement of its implementation geared towards effective and efficient coastal resource management.

The researcher adopted the descriptive survey method since the aim of the study is to present the facts concerning the extent of the coastal resource management program implementation in the city of Calbayog. It is further justified that it is conducted to establish the nature of the existing implementation of the coastal resource management program. Hence, the researcher believes that this method is appropriate.

The main instrument used to gather data from the respondents was a self-made questionnaire-checklist on personal information, activities and projects, the

extent of implementation, and problems and constraints in the coastal resource management program implementation.

The responses and all other information gathered out of said instruments were quantified, analyzed, and statistically interpreted. The researcher utilized the following statistical tools: frequency counts, percentage, mean, standard deviation, and other appropriate statistical tools like analysis of variance (ANOVA), Pearson Product-Moment correlation, Fisher's t-test and Scheffe's test. The results and interpretation of the data served as basis for the improvement of CRM program implementation.

The perception of the different groups of respondents on the extent of CRM program implementation on the different areas of concerns, like public education, capability building, fishery legislation and law enforcement, resource regeneration and enhancement, establishment of protected areas, alternative livelihood, and research were compared. Likewise, the extent of CRM program implementation and the profile of the fisherfolks and technologists/department managers, i.e., age, sex, civil status, educational background, average family monthly income and number of year in CRM experience were also compared. The researcher also established if there were differences on the perception of the four groups of respondents on the problems and constraints felt in the CRM program implementation in Calbayog City. Appropriate statistical analyses were adopted. The results were provided with discussions and implications.

Instrumentation

Various instruments were used in this study. These include questionnaire, structured interview, and documentary analysis. The use of several instruments was necessary in order to obtain valid and reliable data.

Questionnaire. This is the most important instrument used by the researcher in gathering data for this study. Two sets of questionnaires were prepared, one for municipal and commercial fisherfolks, and another for the barangay officials and technologists/ department managers.

The questionnaire for the municipal and commercial fisherfolks consists of four parts: Part I - for the personal information about the respondents' sex, age, civil status, educational background, length of CRM experience, average monthly family income, and trainings attended related to CRM; Part II – include the relevant data on the projects implemented, including their nature, status, and descriptions; Part III - deals on the extent of implementation of coastal resource management program, and Part IV – deals on the problems encountered in the implementation of coastal resource management program.

For the other groups of respondents, the questionnaire consists of three parts: Part I – for personal information of the respondents; Part II - extent of implementation of CRM program; and Part III – on problems encountered. Items for additional comments and suggestions were likewise provided in both sets of questionnaires.

The 5-point criterion is used as rating scale on the extent of CRM implementation and problems encountered. The meaning of each number is as follows:

Scale	Numerical Value	Interpretation
5	4.51 - 5.00	Very much implemented (VMI) Very much a problem (VMAP)
4	3.51 - 4.50	Much implemented (MI) Much a problem (MAP)
3	2.51 - 3.50	Moderately implemented (MoI) Moderately a problem (MoAP)
2	1.51 - 2.50	Slightly implemented (SI) Slightly a problem (SAP)
1	1.00 - 1.50	Not implemented at all (NI) Not a problem at all (NAP)

A vernacular version of the questionnaire was administered to respondents who cannot fully understand the English language. For those who are non-literate, the interview was resorted to. However, for this study, all the respondents were literate.

Documentary analysis. In order to guide the researcher in obtaining the necessary data relevant to the study, records and files were secured from the Office of the City Agriculturist, the Bureau of Fisheries and Aquatic Resources, and in the barangays. These include the names and areas of assignment of the technologists, and the complete list of the fisherfolks, as well as the activities and projects being implemented.

Validation of the Instrument

After the researcher has formulated the questionnaire, it was submitted to his adviser for comments and suggestions as basis for its improvement and revisions. Later, the questionnaire was validated through try-out among municipal fisherfolks engaged in drift gill net and trawlers in Sta. Margarita, Samar and extension workers under the fisheries division staff of the office of the Provincial Agriculturist in Catbalogan City. After the try out, the instrument was validated further by fishery extension specialists and professors of Samar State University College of Fisheries to ensure clarity of language and content of the included items. All their suggestions and recommendations were considered by the researcher.

The test-retest method was applied with a one-week interval to obtain the coefficient correlation. The researcher administered the same activity to the same respondents after the first test one week after to measure the reliability of the instruments. The result of the first test and the second test were compared and analyzed. The computed r was 0.89 which implies that the instruments had a fairly high reliability and adequate for individual measurement.

Sampling Procedure

The respondents of the study consisted of four groups, namely: municipal fisherfolks, commercial fisherfolks, barangay officials, and technologists/ department managers. In the selection of technologists/ department heads total

enumeration was done since there were only 14 respondents involved. On the other hand, for the municipal fisherfolks, commercial fisherfolks, and barangay officials, stratified random sampling was adopted. The sample size was determined using the Sloven's formula (Pagoso et al., 1985: 18), as follows:

$$n = \frac{N}{1 + Ne^2}$$

Where: n - refers to the size of the samples

N - refers to the total population of the target group

e - refers to the desired margin of error or level of significance which is set at .05 in this study.

Data Gathering Procedure

A communication from the Acting Dean was requested by the researcher indorsing him to the city mayor of Calbayog and heads of government agencies for the conduct of the study as a requirement for graduation in the Master in Fisheries Technology Program of Samar State University Mercedes Campus. Approval was sought before the fielding of questionnaires to prospective respondents.

The list of barangays and addresses of identified fisherfolk-respondents, barangay officials, technologists/department managers was made. The researcher distributed and retrieved the questionnaires personally in order for him to make observations and gather other pertinent data which will reinforce

his findings and to conduct structured interview with the respondents, as well as to ensure high percentage of retrieval. However, at the barangay level, before the distribution of the questionnaires and interview was made to the respondents, a courtesy call to the Barangay Captains was made to give preliminary information and solicit full cooperation among the respondents within the area of responsibility.

Since the interviews made were considered as preliminary survey and the responses were deemed incidental talks on personal feedbacks based on experiences, the data gathered were not made as sole basis for drawing valid conclusions. However, comments or remarks could confirm the validity of the responses in the questionnaire. In order to clarify information given in the questionnaire, respondents in a case-to-case situation were interviewed for verification of responses.

Data gathering was done for approximately two months and a half which covered the period from November 2009 to January 2010.

Statistical Treatment of Data

The data obtained were tallied, scored, tabulated and grouped according to the type of respondents and were organized and presented in tabular form.

For data analysis, different statistical tools were used, namely: Pearson Product-Moment Correlation Coefficient, weighted means, Analysis of Variance (ANOVA), Scheffe's Test, and Fisher's t-test.

Pearson Product-Moment Correlation Coefficient. This statistical tool was applied in determining the reliability of the instrument through the test-re-test method.

Weighted means. The weighted means were computed in determining the perceptions of the four groups of respondents on the extent of implementation of CRM program and the problems they encountered using the 5-point rating scale.

For the extent of CRM implemtation

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much Implemented (VMI)
4	3.51 - 4.50	Much Implemented (MI)
3	2.51 - 3.50	Moderately Implemented (MoI)
2	1.51 - 2.50	Slightly Implemented (SI)
1	1.00 - 1.50	Not Implemented at all (NI)

For the problems encountered in CRM

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much a Problem (VMA)
4	3.51 - 4.50	Much a Problem (MA)
3	2.51 - 3.50	Moderately a Problem (MoAP)
2	1.51 - 2.50	Slightly a Problem (SAP)
1	1.00 - 1.50	Not a Problem at all(NA)

Analysis of variance. This statistical tool was used for the purpose of determining significant difference among the perceptions of the four groups of respondents on the extent of implementation and problems encountered.

Scheffe's test. For hypothesis that was rejected using ANOVA, further tests was done for comparing the group means and for identification as to where the significant difference(s) lay with the use of the Scheffe's test.

Fisher's t-test. This was used to estimate the significance of the computed correlation coefficient particularly on the relationship between the personal characteristics of the respondents and the extent of implementation of CRM program.

Chapter 4

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter presents the data obtained through the survey conducted. Included in this chapter are the profile of respondents, status of projects in CRM implemented, the extent of implementation, the extent of problems encountered by the respondents on CRM implementation, and tests of hypotheses. Pertinent data are herein presented in tabular forms with their discussions and interpretations.

Profile of Respondents

Discussed in this section are the characteristics of the respondents in terms of sex, age, civil status, educational background, length of experience related to CRM, trainings attended related to CRM, and average monthly income.

Sex. Table 1 contains the data relative to sex distribution of the respondents. Out of 649 respondents involved in the study, majority is male as evidenced by the fact that 77.97 percent belonged to this sex while 22.03 percent are females. Among groups, the male respondents comprise 100.00 percent among commercial fisherfolks, 78.51 percent among municipal fisherfolks, 65.29 percent among barangay officials, and 57.14 percent among technologists/department managers. However, among the females, the technologists/department managers' group posted at 42.86 percent, followed

by barangay officials at 34.71 percent, then by municipal fisherfolks at 21.49 percent.

Table 1

Sex Distribution of the Respondents

Respondents' Category	Sex		Total
	Male	Female	
1. Municipal Fisherfolk (MF)	285 (78.51%)	78 (21.49%)	363 (110%)
2. Commercial Fisherfolk (CF)	102 (100%)	0 (0%)	102 (110%)
3. Barangay Officials (BO)	111 (65.29%)	59 (34.71%)	170 (100%)
4. Technologists/Department Managers (T/DM)	8 (57.14%)	6 (42.86%)	14 (100%)
Total	**506 (77.97%)**	**143 (22.03%)**	**649 (100%)**

Age. The age distribution of the four groups of respondents is shown in Table 2. It can be gleaned from the table that among the municipal fisherfolks the highest percentage of 29.20 percent belonged to the age bracket 35– 44 years and the lowest belonged to age bracket 65 and up years old. For the commercial fisherfolks 28.40 percent, which is the highest belonged to age bracket 25 – 34 years old, followed by 26.50 percent in age bracket 15– 24 years old. The lowest percentage belonged to 60 years old and above with 5.88 percent. Younger respondents were involved in commercial fisheries than in municipal fisheries.

barangay officials, many of the respondents belonged to age brackets 34 – 45 years (30.59 percent) and 45 – 54 years of age (28.82 percent). The youngest respondents belonged to age bracket 24 years old and below which comprised

Table 2

Age Distribution of Respondents

Age (Groups)	Respondents' Category								Grand Total	Percent (%)
	MF		CF		BO		T/DM			
	No.	%	No.	%	No.	%	No.	%		
65 – up	23	6.34	6	5.88	17	10.00	-	-	46	7.10
55 – 64	41	11.29	11	10.78	20	11.77	5	35.71	77	11.86
45 – 54	98	27.00	13	12.75	49	28.82	7	50.00	167	25.73
35 – 44	106	29.20	16	15.69	52	30.59	2	14.29	176	27.12
25 – 34	51	14.05	29	28.40	26	15.29	-	-	106	16.33
15 – 24	44	12.12	27	26.50	6	3.53	-	-	77	11.86
Total	**363**	**100**	**102**	**100**	**170**	**100**	**14**	**100**	**649**	**100**
Mean (in years)	42.53		37.54		45.50		50.21		43.94	-
SD (in years)	13.51		15.47		12.47		4.92		11.59	-

Legend:

MF - Municipal Fisherfolks
CF - Commercial Fisherfolks
BO - Barangay Officials
T/DM - Technologists/Department Managers

This could be attributed to the fact that commercial fishing outfits require more number of younger fishing crew to undertake minor tasks such as in hauling

lines and ropes, sorting of catch, food preparation, and as helpers. Among 3.53 percent while the oldest respondents belonged to age bracket 65 years old and above which constitute 10.00 percent from the total municipal fisherfolks respondents. The technologists/department managers group belonged to age brackets 45 – 54 years old (50.00 percent), followed by 55 – 64 years old (35.71 percent), then by 35 – 44 years old (14.29 percent).

In general, more respondents belonged to age brackets 35 – 44 (27.12 percent) and 45 – 54 (25.73 percent). In terms of average age in years, technologists/department managers posted the highest of 50.21 years, followed by barangay officials with 45.50 years old, then commercial fisherfolks which is 42.53 years old, and municipal fisherfolks which is 37.54 years old.

Civil status. In terms of civil status, the data reflected in Table 3 showed that out of 649 respondents involved in the study 87.83 percent are married, followed by single respondents which posted at 9.40 percent. Widows/widowers posted at 2.77 percent.

Among municipal fisherfolks 87.60 percent are married, 9.37 percent are single, and 3.03 percent are widow/widower. For the commercial fisherfolks, 79.41 percent are married with 20.59 percent single respondents. Among barangay officials 93.53 percent are married, 3.53 percent widow/widower, and 2.94 percent are single. Out of the total number of technologists/ department managers, 85.72 percent are married, 7.14 percent single, and 7.14 percent widow/widower.

Table 3

Profile of Respondents in Terms of Civil Status

Age (Groups)	Respondents' Category								Grand Total	Percent (%)
	MF		CF		BO		T/DM			
	No.	%	No.	%	No.	%	No.	%		
Single	34	9.37	21	20.59	5	2.94	1	7.14	61	**9.40**
Married	318	87.60	81	79.41	159	93.53	12	85.72	570	**87.83**
Widow/ Widower	11	3.03	-		6	3.53	1	7.14	18	**2.77**
TOTAL	**363**	**100**	**102**	**100**	**170**	**100**	**14**	**100**	**649**	**100**

Legend:

MF - Municipal Fisherfolks
CF - Commercial Fisherfolks
BO - Barangay Officials
T/DM - Technologists/Department Managers

Educational background. Table 4 shows the profile of respondents as to educational background. Among municipal fisherfolks, 34.71 percent had elementary level of education, 25.07 percent are elementary graduates, 16.53 percent are high school level, 13.22 percent high school graduates, 6.06 percent college level, and 4.41 percent possessing baccalaureate degrees. For the commercial fisherfolks, 46.10 percent had elementary level of education, 19.60 percent graduated elementary grade, 14.70 percent high school level, 10.78 percent finished secondary level, 4.90 percent at college level, and 3.92 percent earned baccalaureate degrees. The educational background of barangay officials showed that 14.12 percent had elementary level of education, 22.94 percent

Table 4

Profile of Respondents in Terms of Their Educational Background

Educational Background	Respondents' Category								Grand Total	(%)
	MF		CF		BO		T/DM			
	No.	%	No.	%	No.	%	No.	%		
Master's Degree Holder	-	-	-	-	-	-	3	21.40	3	0.46
With Master's Units							2	14.30	2	0.31
Baccalaureate Degree Holder	16	4.41	4	3.92	19	11.18	9	64.30	48	7.40
College Level	22	6.06	5	4.90	24	14.12	-	-	51	7.86
High School Graduate	48	13.22	11	10.78	26	15.29	-	-	85	13.10
High School Level	60	16.53	15	14.70	38	22.35	-	-	113	17.41
Elementary Graduate	91	25.07	20	19.60	39	22.94	-	-	150	23.11
Elementary Level	126	34.71	47	46.10	24	14.12	-	-	197	30.35
TOTAL	**363**	100	**102**	100	**170**	100	**14**	100	**649**	**100**
Fields of Specialization (Baccalaureate and Graduate Studies)										
Fishery-related Courses	5	31.25	0	0	2	10.53	3	21.43	**10**	18.87
Non-fishery Related Courses	11	68.75	4	100	17	89.47	11	78.57	**43**	81.13
TOTAL	**16**	100	**4**	100	**19**	100	**14**	100	**53**	**100**

Legend:
MF - Municipal Fisherfolks
CF - Commercial Fisherfolks
BO - Barangay Officials
T/DM - Technologists/Department Managers
% - Percent

completed the elementary grade, 22.35 percent with high school level, 15.29 percent graduated secondary level, 14.12 percent college level, and 11.18 percent with college degrees. Among the technologists and department managers, 64.30 percent are baccalaureate degree holders, 14.30 percent with master's units, and 21.40 percent full-fledged master's holders.

As regard to the fields of specialization of 53 respondents who studied undergraduate and graduate courses, 18.87 percent were related to fisheries while 81.13 percent were not related to fisheries as their fields of specialization. As presented in Table 4, from the groups of respondents who underwent studies related to fisheries, 31.25 percent come from municipal fisherfolks, 21.43 percent from technologists and department managers, 10.53 percent from barangay officials, and none from among commercial fisherfolks.

Length of experience of respondents related to coastal resource management. Table 5 presents the data on length of experience of the respondents related to coastal resource management. It shows that majority of the municipal fisherfolks, that is, 50.41 percent had 11 – 15 years of experience, followed by 21.21 percent with 6 – 10 years, then 14.05 percent with 16 – 20 years, and 7.72 percent with 1 – 5 years. The least obtained percentages of 3.58 and 3.08 percent are those with 21 – 25 years and 26 – 30 years of experience, respectively. For the commercial fisherfolk-respondents, the lengths of experience were recorded at 26.47 percent (6 – 10 years), 24.51 percent (11 - 15 years), 20.59

Table 5

Length of Experience of Respondents Related to Coastal Resource Management

Length of Experience (in years)	Respondents' Category								Grand Total	(%)
	MF		CF		BO		T/DM			
	No.	%	No.	%	No.	%	No.	%		
26 – 30	11	3.03	8	7.84	15	8.82	3	21.40	**37**	5.70
21 – 25	13	3.58	12	11.77	33	19.41	5	35.70	**63**	9.71
16 – 20	51	14.05	21	20.59	47	27.65	3	21.40	**122**	18.80
11 – 15	183	50.41	25	24.51	40	23.53	2	14.30	**250**	38.52
6 – 10	77	21.21	27	26.47	21	12.35	1	7.14	**126**	19.41
1 – 5	28	7.72	9	8.82	14	8.24	-	-	**51**	7.86
TOTAL	**363**	100	**102**	100	**170**	100	**14**	100	**649**	100
Mean (in years)	12.82	-	14.18	-	16.21	-	17.29	-	15.12	-
SD (in years)	5.32	-	6.97	-	6.87	-	5.22	-	6.95	-

Legend:
MF - Municipal Fisherfolks
CF - Commercial Fisherfolks
BO - Barangay Officials
T/DM - Technologists/Department Managers
% - Percent

percent (16 – 20 years), 11.77 percent (21 – 25 years), 8.82 percent (1 – 5 years), and 7.84 percent (26 – 30 years). For the barangay officials group, 27.65 percent had lengths of experience of 16 – 20 years, 23.53 percent with 11 – 15 years, 19.41 percent with 21 – 25 years, 12.35 percent with 6 – 10 years, 8.82 percent of 26 – 30 years, and 8.24 with 1 – 5 years length of experience related to CRM.

On the average, the length of experience of the technologists/department managers posted the highest mean of 17.29 years with a standard deviation of

5.22, followed by the barangay officials with 16.21 years and a standard deviation of 6.87, then by the commercial fisherfolks with 14.18 years with standard deviation of 6.97, and finally by municipal fisherfolks which pegged at 12.82 years and a standard deviation of 5.32.

Trainings related to CRM attended by respondents. Data on trainings attended by respondents related to coastal resource management from 2006 – 2009 is shown in Table 6.

At the national level, 42.90 percent among the technologists/ department heads and 4.13 percent from among the municipal fisherfolks attended trainings related to CRM for one to five times for the entire surveyed period. Other groups of respondents did not avail themselves of any training at this level.

In the regional level, all groups of respondents were given the opportunity to attend trainings related to CRM for one to five times. This corresponds to 58 (15.98 percent) of the municipal fisherfolks, 11 (10.78 percent) among commercial fisherfolks, 34 (20.00 percent) from among the barangay officials, and 10 (71.40 percent) from the technologists/ department managers.

At the local level, on the other hand, majority of the total respondents had the opportunity to attend trainings related to coastal resource management as shown by the attendance of 100.00 percent of the technologists/ department managers, 95.10 percent of the commercial fisherfolks, 85.40 percent of the municipal fisherfolks, and 62.35 percent of the barangay officials.

Table 6

Trainings Related to Coastal Resource Management Attended by Respondents

Number of Trainings Attended	Respondents' Category								Grand Total	(%)
	MF		CF		BO		T/DM			
	No.	%	No.	%	No.	%	No.	%		
National Level:										
1 – 5	15	4.13	-	-	-	-	6	42.90	21	3.24
None	348	95.87	102	100	170	100	8	57.10	628	96.76
TOTAL	**363**	100	**102**	100	**170**	100	**14**	100	**649**	100
Regional Level:										
1 – 5	58	15.98	11	10.78	34	20.00	**10**	**71.40**	**113**	17.41
None	305	84.02	91	89.22	136	80.00	**4**	**28.60**	**536**	82.59
Total	**363**	100	**102**	100	**170**	100	**14**	**100**	**649**	100
Local Level:										
1 – 5	310	85.40	97	95.10	106	62.35	**14**	**100**	**527**	81.20
None	53	14..60	5	4.90	64	37.65	**0**	**0**	**122**	18.80
Total	**363**	100	**102**	100	**170**	100	**14**	100	**649**	**100**

Legend:
MF - Municipal Fisherfolks
CF - Commercial Fisherfolks
BO - Barangay Officials
T/DM - Technologists/Department Managers
% - Percent

Average monthly income of respondents. The average monthly income of the municipal fisherfolks, commercial fisherfolks, barangay officials, as well as technologists/ department managers is shown in Table 7.

Table 7

Profile of Respondents as to Average Monthly Income

Average Monthly Income (in Pesos)	Respondents' Category								Grand Total	(%)
	MF		CF		BO		T/DM			
	No.	%	No.	%	No.	%	No.	%		
24,000 - up	-	-	6	5.88	-	-	4	28.57	**10**	1.54
23,001 – 24,000	-	-	-	-	-	-	-	-		
22,001- 23,000	-	-	-	-	3	1.77	2	14.285	**5**	0.77
21,001- 22,000	-	-	-	-	-	-	-	-		
20,001 - 21,000	-	-	5	4.90	1	0.59	-	-	**6**	0.92
19,001 – 20,000	-	-	-	-	-	-	-	-		
18,001 – 19,000	-	-	-	-	-	-	3	21.43	**3**	0.46
17,001 – 18,000	-	-	-	-	3	1.77	-	-	**3**	0.46
16,001 – 17,000	-	-	-	-	-	-	-	-		
15,001 – 16,000	-	-	8	7.84	2	1.18	2	14.285	**12**	1.85
14,001 – 15,000	7	1.93	5	4.90	-	-	-	-	**12**	1.85
13,001 – 14,000	-	-	-	-	-	-	-	-		
12,001 – 13,000	-	-	-	-	4	2.35	3	21.43	**7**	1.08
11,001 – 12,000	-	-	10	9.80	9	5.29	-	-	**19**	2.93
10,001 – 11,000	-	-	-	-	7	4.12	-	-	**7**	1.08
9,001 – 10,000	9	2.48	11	10.79	-	-	-	-	**20**	3.08

Table 7 continued

Average Monthly Income (in Pesos)	Respondents' Category								Grand Total	(%)
	MF		CF		BO		T/DM			
	No.	%	No.	%	No.	%	No.	%		
8,001 – 9,000	-	-	-	-	6	3.53	-	-	**6**	0.93
7,001 – 8,000	-	-	-	-	10	5.88	-	-	**10**	1.54
6,001 – 7,000	4	1.10	15	14.71	17	10.00	-	-	**36**	5.55
5,001 – 6,000	-	-	24	23.53	43	25.29	-	-	**67**	10.32
4,001 – 5,000	22	6.06	18	17.65	33	19.41	-	-	**73**	11.25
3,001 – 4,000	-	-	-	-	32	18.82	-	-	**32**	4.93
2,001 – 3,000	157	43.25	-	-	-	-	-	-	**157**	24.19
1,001 – 2,000	98	27.00	-	-	-	-	-	-	**98**	15.10
1,000 and below	66	18.18	-	-	-	-	-	-	**66**	10.17
TOTAL	**363**	**100**	**102**	**100**	**170**	**100**	**14**	**100%**	**649**	**100**
Mean (in pesos)	**3,757.40**		**9,803.92**		**11,720.60**		**19,857.14**			

Legend:
MF - Municipal Fisherfolks
CF - Commercial Fisherfolks
BO - Barangay Officials
T/DM - Technologists/Department Managers
% - Percent

The monthly income of municipal fisherfolks ranged from below PhP 1,000 and PhP 14,001 – PhP 15,000 brackets, PhP 14,001 – PhP 24,000 and above for the commercial fisherfolks-respondents, PhP 3,001 – PhP 4,000 bracket and PhP 22,001 – PhP 23,000 for the barangay officials-respondents, and PhP 12,001 – PhP 24,000 and above for the technologists and department managers. As to groups of respondents, the highest percentage of fisherfolks in municipal fisheries

which is 43.25 percent declared an average monthly income bracket of PhP 2,001 – PhP 3,000 while the lowest which is 1.10 percent at bracket PhP 6,001 – PhP 7,000. For those involved in commercial fishing operations, the greatest percentage of 23.53 percent belongs to bracket PhP 5,001 – PhP 6,000 per month. On the other hand, among barangay officials, 25.29 percent is recorded at bracket PhP 5,001 – PhP 6,000 as the highest percentage with 0.59 percent as the lowest in bracket PhP 20,001 – PhP 21,000. Finally, for the technologists and department managers, 28.57 percent belonged to bracket PhP 24,001 and above, 21.43 percent in brackets PhP 18,001 – PhP 19,000 and PhP 12,001 – PhP 13,000. The lowest percentage for this group of 14.285 percent belonged to brackets PhP 22,001 – PhP 23,000 and PhP 15,001 – PhP 16,000.

The mean values on the income of the different groups of respondents are: PhP 3,757.40 for the municipal fisherfolks, PhP 9,803.92 for commercial fisherfolks, PhP11,720.60 for barangay officials, and 19,857.14 for technologists and department managers. The income of commercial fishers, municipal fishers, and barangay officials are way below the poverty threshold of Western Samar as indicated by NEDA which is PhP13, 517.00 (NEDA, 2006).

Profile and Status of CRM Projects

Presented in Table 8 are the CRM projects being implemented in the different barangays of the city of Calbayog. Out of 34 barangays involved in the study, only 17 barangays have projects implemented which were: Bagacay,

Banti-an, Binaliw, Bugtong, Caglanipao Sur, Cagmanipis Sur, Cag-olango, Carayman, Malajog, Manguino-o, Matobato, Salhag, San Joaquin, San Policarpio, Tinambacan Norte, Tinambacan Sur, Tinaplacan, and Tomaligues. These

Table 8

Projects on Coastal Resources Management Implemented In the Different Barangays of Calbayog City

Projects Implemented	f	Percent
-	1. Aguit-itan	-
-	2. Baay	-
Artificial reef	3. Bagacay	1
-	4. Bante	-
Artificial reef	5. Bantian	1
-	6. Basud	-
Livelihood and Fish sanctuary	7. Binaliw	2
Artificial Reef and Livelihood Project	8. Bugtong	2
Artificial Reef and Mariculture	9. Caglanipao Sur	2
-	10. Cagsalaosao	-
-	11. Cagmanipis Norte	-
Artificial Reef	12. Cagmanipis Sur	1
-	13. Cagnipa	-
Artificial Reef	14. Cag-olango	1
-	15. Cahumpan	-
-	16. Capoocan	-
Livelihood Project	17. Carayman	1
-	18. Malaga	-
Livelihood Project , Fish sanctuary and Mariculture	19. Malajog	3
-	20. Malayog	-
-	21. Malopalo	-
Artificial Reef	22. Manguinoo	1
-	23. Marrcatubig	-
Artificial Reef and Livelihood Project	24. Matobato	2
-	25. Obrero	-
-	26. Peña	-
Mangrove Reforestation	27. Salhag	1
Fish Sanctuary	28. San Joaquin	1

Table 8 continued

Name of Project Implemented	f	Percent
Mangrove Reforestation and Artificial Reef	29. San Policarpo	2
Artificial Reef , Fish Sanctuary, Mangrove Reforestation, and Livelihood project	30. Tinambacan Norte	4
Fish Sanctuary, Mangrove Reforestation, and Livelihood project	31. Tinambacan Sur	3
Artificial Reef and Mariculture	32. Tinaplacan	2
-	33. Trinidad	
Mangrove Reforestation and Artificial reef	34. Tomaligues	2
Total	-	-

projects were: artificial reefs, fish sanctuary, mariculture, mangrove reforestation, and livelihood projects.

Artificial reef project. Data on artificial reef projects are shown in Table 9. Artificial reefs were established in majority of the barangays of Calbayog City, except in barangays Aguit-itan, Cagsalaosao, Cahumpan, Capoocan, Malopalo, Marcatubig, Obrero, and Trinidad. The major reason for this is that the locations as to bottom substrates and water depths are not favorable for the establishment of artificial reef structures. However, for the study period (2006 – 2009), artificial reefs were established at the following barangays: Bagacay, Banti-an, Bugtong, Caglanipaw Sur, Cagmanipis Sur, Cag-olango, Manguino-o, Matobato, San Policarpo, Tinambacan Norte, Tinaplacan, and Tomaligues . The artificial reef structures were made up of used tires and formed into pyramids while those

made up of concrete were cubical in design. These were set-up on sandy bottoms at water depths (at lowest low tide) which ranged from 15 – 22 meters as structures for resource regeneration and enhancement. The number of artificial reef units established in every barangay ranged from 4– 15 units.

Table 9

Artificial Reef Projects Established in the Year 2006 - 2009

Barangay	Year Estab-lished	No. of Units	Material Used	Type of Sub-strate	Water Depth (m)	Cons-truction Design	No. of Fisherfolk Involved In Manage-ment
1. Bagacay	2008	10	Used Tires	Sandy	15	Pyramid	50
2. Banti-an	2006	7	Concrete	Sandy	22	Cube	98
3. Bugtong	2006	15	Used Tires	Sandy	18	Pyramid	120
4. Cag-olango	2006	10	Concrete	Sandy	18	Cube	30
5. Cagmanipis Sur	2007	5	Concrete	Sandy	20	Cube	70
6. Manguino-o	2007	4	Used Tires	Sandy	20	Pyramid	400
7. Matobato	2007	10	Concrete	Sandy	15	Cube	250
8. San Policarpo	2006	8	Used Tires	Sandy	15	Pyramid	200
9. Tinambacan Norte	2008	15	Used Tires	Sandy	16	Pyramid	150
10. Tinaplacan	2006	10	Concrete	Sandy	20	Cube	120
11. Tomaligues	2009	12	Used Tires	Sandy	18	Pyramid	200

The number of fisherfolks involved in the management of the project ranged from 30 to 400.

Fish sanctuary project. As shown in Table 10, fish sanctuary projects were established only in barangays San Joaquin and Tinambacan Norte. In San

Joaquin, this was established in 2009 with an area of 14 hectares under City Ordinance Number 2009-01-083 benefiting the nearby barangays of Ba-ay and Cagnipa. For the fish sanctuary project in Tinambacan Norte, this was established in 2007 having an area of 14.6 hectares under City Ordinance Number 2007-10-050 serving barangays Tinambacan Norte, Tinambacan Sur, and Bante. However, a total of 4 fish sanctuaries and protected areas have already been established in the city.

Table 10

Fish Sanctuary Projects Established
(Year 2006 – 2009)

Barangay	Year Estab-lished	Area (has.)	Coor-dinates	Legal Basis	Project Status
1. San Joaquin	2009	14.00	12°06′12″N 124° 30′12″E 12° 06′14″ N 124° 30′40″E 12° 06′11″N 124° 30′19″E 12° 06′15″N 124° 30′24″E	City Ordinance No. 2009-01-083	On-going project; Fish Sanctuary Management Council formed; buoys and markers installed and maintained; regular patrolling being undertaken
2. Tinambacan	2007	14.60	12°05′18″N 124° 29′37″E 12° 05′27″ N 124° 29′29″E 12° 05′21″N 124° 29′18″E 12° 05′12″N 124° 29′24″E	City Ordinance No. 2007-10-050	On-going project; Fish Sanctuary Management Council formed; buoys and markers installed and maintained; regular patrolling being undertaken

In both projects, Fish Sanctuary Management Councils have been formed and presently active in its management. Buoys and markers have been set up and maintained, as well as regular patrolling in the area is being undertaken.

Mariculture projects. Presented in Table 11 are the data on mariculture projects implemented in the City of Calbayog under the CRM Program. These projects are on seaweeds culture and culture of milkfish in cages implemented in Barangay Caglanipao Sur, Bugtong and Tinaplacan using *Kappaphycus alvarizzi* as the primary crop. As to area planted Caglanipao Sur utilized 0.10 hectare; Bugtong with 1.00 hectare and Tinaplacan with 0.10 hectare. The three barangays adopted the hanging monoline method of culture which usually takes place during September to April of each year for about a 45-day growing period and at four croppings every year. Caglanipao reported an average of 700 per hectare per cropping while Bugtong of 2,000 kilograms per hectare per cropping, and Tinaplacan 300 kilograms per hectare per cropping. The project beneficiaries adopted sun drying as the post harvest technique and marketed at Tacloban City. This mariculture project had 12 beneficiaries from Caglanipao Sur, 45 from Bugtong, and 15 from Tinaplacan.

These three barangays adopted this project because of the suitability of its location as regards to current, depth, and other hydrological factors and the technical expertise of fisherfolk-beneficiaries who are migrants from Zamboanga where seaweed culture is very much practiced and popular.

Table 11

Mariculture Projects Implemented in the City of Calbayog (2006 – 2009) under the CRM Program

Project Profile	Barangay			
	Caglanipao Sur	Bugtong	Malajog	Tinaplacan
Seaweeds Culture				
1. Area Planted	0.10 ha.	1.00 ha.	-	0.10 ha.
2. Culture Type	Hanging monoline	Hanging Monocline	-	Hanging monoline
3. Species Cultured	*Kappaphyc-us. alvarezii*	*Kappaphycus. Alvarezii*	-	*Kappaphycus. Alvarezii*
4. Culture Period	45 days	45 days	-	45 days
5. Planting Season	September – April	September – April	-	September – April
6. Production (kg/yr) (Wet Weight)	700 kg.	2,000 kg.	-	300 kg.
7. Number of cropping per year	4	4	-	4
8. Post-harvest Technique	Sundrying	Sundrying	-	Sundrying
9. Market Destination	Tacloban City	Tacloban City		Tacloban City
10.Number of Beneficiaries	12	45	-	15
Fish Cage				
1. Species Cultured	-	-	Milkfish	-
2. Cage Dimensions per Unit	-	-	10 m x 10 m	-
3. Cage Design	-	-	Square	-
4. Number of Units	-	-	3	-
5. Stocking Rate	-	-	20,000/unit	-
6. Size at Stocking	-	-	Fingerlings (8 – 10 cm.)	-
7. Culture Period	-	-	102 - 110 days	-
8. No. of cropping per Year	-	-	2	-
9. Survival Rate	-	-	85%	-
10. Production (kg.ha./year)	-	-	6,500 kg/unit	-

Cage culture of milkfish was solely implemented in barangay Malajog. The area favors this mariculture activity because the structures are installed in cove and being protected from strong wind and big waves during southwest monsoon ("habagat"). The cages are in square shapes framed with galvanized iron pipes with dimensions of 10 meters by 10 meters. These units of fish cages are in operational and stocked with milkfish fingerlings (about 8-10 cm in length) at 20,000 pieces per unit. The stocks are raised for 102- 110 days. Survival rate is 85 percent on the average. Production is about 6,500 kilograms per unit. The beneficiaries had a stocking in these cages twice a year.

Livelihood projects implemented under the CRM program. It can be gleaned in Table 12 the profile of livelihood projects implemented under the CRM program of the city of Calbayog. Only five out of 34 barangays involved in the study have implemented livelihood projects.

In Binaliw, multiple long lines fishing ("Kitang") was implemented with an initial investment of PhP 150,000.00 from QUEDANCOR with 21 beneficiaries. Seaweed culture was the livelihood project in barangay Bugtong with an initial investment of PhP 65,000.00 with 15 beneficiaries. In barangay Carayman, the 12 beneficiaries adopted the fish/squid pot fishing with an initial investment of PhP 113,000.00 while barangay Malajog has gone into milkfish cage culture with 45 beneficiaries and an initial investment of PhP 750,000.00. Finally vacuum-packed smoked fish particularly sardine, mackerel and milkfish was implemented in

used, municipal fishing activities, and major species caught, and the fishing grounds.

Number of municipal fisherfolk-respondents. It can be gleaned in Table 13 the total number of 34 municipal fisherfolks involved in the study. These include the total number of coastal barangays in the city of Calbayog.

Table 13

Number of Municipal Fisherfolks Involved in the Study

Barangay	Number of Municipal Fisherfolk-Respondents	Percent
1. Aguit-itan	2	0.54
2. Baay	6	1.55
3. Bagacay	5	1.29
4. Bante	14	3.88
5. Bantian	9	2.54
6. Basud	2	0.51
7. Binaliw	7	2.02
8. Bugtong	11	3.11
9. Caglanipao Sur	11	3.18
10. Cagsalaosao	2	0.41
11. Cagmanipis Norte	11	2.98
12. Cagmanipis Sur	7	1.81
13. Cagnipa	6	1.68
14. Cag-olango	3	0.77
15. Cahumpan	2	0.54
16. Capoocan	2	1.21
17. Carayman	28	7.77
18. Malaga	17	4.58
19. Malajog	9	2.48
20. Malayog	14	3.75
21. Malopalo	7	1.86
22. Manguinoo	38	10.37
23. Marcatubig	6	1.60
24. Matobato	24	6.48
25. Obrero	2	0.64

Table 13 continued

Barangay	Number of Municipal Fisherfolk-Respondents	Percent
26. Peña	17	4.66
27. Salhag	5	1.94
28. San Joaquin	17	4.77
29. San Policarpo	19	5.18
30. Tinambacan Norte	14	3.88
31. Tinambacan Sur	12	3.37
32. Tinaplacan	11	3.11
33. Trinidad	1	0.38
34. Tomaligues	18	4.97
Total	**363**	**100.00**

There were 363 municipal fisherfolk-respondents with Barangay Manguino-o having the highest number of 39 which constitute 10.37 percent. The lowest was Barangay Trinidad with 1 respondent and constitute 0.38 percent of the total municipal fisherfolk-respondents.

Boat used. The types of boats used by municipal fisherfolks in the different barangays of Calbayog City are shown in Table 14. Out of 34 barangays, only Aguit-itan and Obrero do not have municipal fisherfolks because the respondents were on commercial fishing; hence, they were included in the study.

As reflected in the table, motorized boats comprised 42.42 percent while non-motorized boats pegged at 57.58 percent. The barangay with the most number of motorized boats of 120 was recorded in Matobato, followed by San

Table 14

Types of Boats Used by Municipal Fisherfolks

Barangay	Boat Used		Total	Percent
	Motorized	Non-motorized		
1. Aguit-itan				
2. Baay	19	55	74	3.16
3. Bagacay	15	41	56	2.39
4. Bante	50	75	125	5.35
5. Bantian	51	17	68	2.91
6. Basud	15	23	38	1.63
7. Binaliw	31	26	57	2.44
8. Bugtong	10	80	90	3.85
9. Caglanipao Sur	33	24	57	2.44
10. Cagsalaosao	9	5	14	0.59
11. Cagmanipis Norte	38	19	57	2.44
12. Cagmanipis Sur	28	18	46	1.97
13. Cagnipa	27	48	75	3.21
14. Cag-olango	9	25	34	1.45
15. Cahumpan	5	16	21	0.89
16. Capoocan	9	6	15	0.64
17. Carayman	20	150	170	7.27
18. Malaga	41	27	68	2.91
19. Malajog	23	12	35	1.49
20. Malayog	55	78	133	5.69
21. Malopalo	9	53	62	2.65
22. Manguinoo	33	20	53	2.26
23. Marcatubig	12	44	56	2.39
24. Matobato	120	12	132	5.65
25. Obrero				
26. Peña	28	103	131	5.60
27. Salhag	35	10	45	1.93
28. San Joaquin	64	150	214	9.16
29. San Policarpo	30	90	120	5.13
30. Tinambacan Norte	48	33	81	3.47
31. Tinambacan Sur	51	19	70	2.99
32. Tinaplacan	25	45	70	2.99
33. Trinidad	6	15	21	0.89
34. Tomaligues	45	6	51	2.18
Total	**991**	**1,345**	**2336**	**100.00%**

Joaquin and Malayog with 64 and 55 boats, respectively. The lowest number of five boats was noted in Barangay Cahumpan. For the non-motorized fishing outfits, barangays Carayman and San Joaquin both obtained the highest number of 150, followed by Barangay Peña with 103 numbers of boats. On the combined data of motorized and non-motorized boats, the five barangays with the highest number were: San Joaquin (214) – 9.16 percent, Carayman (170) – 7.27 percent, Malayog (133) – 5.69 percent, Matobato (132) – 5.65 percent, and Peña (131) – 5.60 percent. Those with the lowest number of motorized and non-motorized boats were: Barangays Cagsalaosao (14) – 0.59 percent, Capoocan (15) – 0.64 percent, Trinidad (21) – 0.89 percent, and Cahumpan (14) – 0.59 percent.

Type of municipal fishing, number of fisherfolks involved, fishing grounds, and dominant species caught. As shown in Table 15, there were 14 fishing activities indulged in by municipal fisherfolks in the city of Calbayog. These include the following:

(1) **Baby ring net fishing**. In this type of fishing there were 70 fisherfolks involved. The areas of fishing were Samar Sea, Carigara Bay, Maqueda Bay, and Visayan Sea. This type of fishing is operated in deeper marine water areas and caught dominantly were pelagic species.

(2) **Shrimp gathering without gear**. This involves the gathering of shrimp species usually undertaken in the shallow coastal waters, estuarine and mangrove areas during low tides at wading depths wherein the gatherers with their bare hands feel the presence of shrimps and gather them. This type of

Table 15

Type of Fishing Activities, Number of Fisherfolks Involved, Fishing Grounds, and Dominant Species Caught

Fishing Activities	Number of Fisherfolks Involved	Dominant Species Caught/ Collected	Fishing Grounds
1. Baby Ring Net Fishing	70	1. Anchovy (*Leiognathus sp.*) 2. Barracuda (*Sphyraena sp.*) 3. Black pomfret (*Stromateus niger*) 4. Bonito (*Euthynnus sp.*) 5. Crevalle sp. (*Caranx sp.*) 6. Herring (*Sardinella sp.*) 7. Mackerel (*Rastrelliger sp.*) 8. Hardtail (*Megalspis sp.*) 9. Roundscad (*Caranx crumenophthalmus*) 10. Slipmouth (*Leiognathus sp.*) 11. Spanish Mackerel (*Cybium commerson*) 12. Tuna (*Neothunnus macropterus*)	1. Samar Sea 2. Carigara Bay 3. Maqueda Bay 4. Visayan Sea.
2. Shrimp gathering without gear	46	1. Banana prawn (*Metapenaus ensis*) 2. White shrimp (*Peneaus semisulcatus*) 3. Tiger shrimp (*Penaeus monodon*)	Coastal Waters of Calbayog city, estuarine and mangrove areas.
3. Seaweeds Gathering	15	1. *Caulerpa sp* "lato" 2. *Gellidiella sp.* "gulaman" 3. *Eucheuma sp.* "gosu"	Coastal waters of Calbayog City
4. Mollusk and crustaceans gleaning/ gathering	98	**Mollusks**: 1. Abalone (*Haliotis sp.*) 2. Arc shell/Cockle (*Anadara sp.*) 3. Aulicina shell (*Aulicina sp.*) 4. Butter cup Lucine (*Anodontia sp.*)	Samar Sea, Coastal waters of Calbayog City

Table 15 continued

Fishing Activities	Number of Fisherfolks Involved	Dominant Species Caught/ Collected	Fishing Grounds
		5. Cerithe (*Cerithidea sp.*) 6. Cone shell (*Conus sp.*) 7. Cowry (*Cypraea sp.*) 8. Dog conch shell (*Strombus sp.*) 9. Inscribed Circe (*Circe sp.*) 10. Horse hoof oyster (*Ostrea mabonensis*) 11. Moon shell (*Amusium sp.*) 12. Murex shell (*Murex sp.*) 13. Pen shell (*Pinna sp.*) 14. Pitar shell (*Pitar sp.*) 15. Surf clam (*Paphia undulata*) 16. Thick Lucina (*Phacoides sp.*) 17. Top shell (*Trochus* sp.) 18. Triton shell (*Cymatium sp.*) 19. Turban shell (*Turbo sp.*) 20. Window-pane shell (*Placuna placenta*) **Crustaceans:** 1. Lobster (*Panilurus sp.*) 2. Mud crab (*Scylla sp.*) 3. Sand crab (*Portunus pelagicus*)	
5. Spear Fishing	43	1. Barracuda sp. (*Sphyreaena sp.*) 2. Caesio sp. (*Caesio sp.*)) 3. Cavalla sp. (*Caranx sp.*) 4. Cuttlefish (*Sepia sp.*) 5. Grouper (*Epinephelus sp.*) 6. Parrot fish (7. Red Snapper (*Lutjanus sp.*) 8. Siganid sp.(*Siganus sp.*) 9. Silver pike eel (*Mureanesox sp.*) 10. Spanish mackerel (*Cybium sp.*) 11. Surgeon fish (*Acanthurus sp.*) 12. Wrasses (*Cheilinus sp.*)	Samar Sea, Coastal waters of Calbayog City
6. Sea cucumber gathering	8		Samar Sea, Coastal waters of Calbayog City

Table 15 continued

Fishing Activities	Number of Fisherfolks Involved	Dominant Species Caught/ Collected	Fishing Grounds
7. Crab/Fish/ Squid Pot Fishing	114	1. Blue crab (*Portunus pelagicus*) 2. Pike Eel (*Muraenesox sp.*) 3. File fish (*Cantherhines sp.*) 4. Grouper (*Epinephelus sp.*) 5. Parrot fish (*Scarus sp.*) 6. Squid (*Loligo sp.*) "no-os" 7. Wrasses (Cheilinus sp.) "mameng"	Samar Sea, Coastal waters of Calbayog City
8. Multiple Set Longline Fishing	190	1. Cavalla (*Caranx sp.*) 2. Croaker (*Pseudosciaena sp.*) 3. Eel (*Muraenesox sp.*) 4. Flathead (*Platycephalus sp.*) 5. Goatfish (*Upeneus sp.*) 5. Grouper (*Epinephelus sp.*) 6. Grunt (*Plectorhinchus sp.*) 7. Porgy (*Lethrinus sp.*) 8. Pomadasid (*Pomadays sp.*) 9. Mackerel (*Rastrellieger sp.*) 10. Nemipterid (*Nemipterus sp.*) 11. Red purple big- eye (*Monotaxis gandoculis*) 12. Snapper (*Lutjanus sp.*) 13. Slipmouth (*Leieognathus sp.*) 14. Sole fish (*Solea sp.*) 15. Stingray (*Dasyatis sp.*) 16. Theraponid (*Therapon sp.*)	Samar Sea, Coastal waters of Calbayog City
9. Hook and Line Fishing	272	1. Barracuda (*Sphyraena sp.*) 2. Common whiting (*Sillago sihama*) 3. Garfish (*Tylosurus sp.*) 4. Grouper (*Epinephelus sp.*) 5. Leather jacket (*Scomberoides* sp.) 6. Mackerel (*Rastrelliger sp.*) 7. Mojarras (*Gerres sp.*) 8. Nemipterid (*Nemipterus sp.*) 9. Roundscad. (*Caranx sp.*) 10. Sardines (*Sardinella sp.*) 11. Theraponid (*Therapon sp.*) 12. Tuna (*Thunus sp.*)	Samar Sea, Coastal waters of Calbayog City

Table 15 continued

Fishing Activities	Number of Fisherfolks Involved	Dominant Species Caught/ Collected	Fishing Grounds
10. Push Net	81	1. Crabs (*Portunus pelagicus*) 2. Shrimps (*Penaues sp./Metapeneaus sp.*)	Coastal waters of Calbayog City, estuarine and mangrove areas.
11. Fish Corral	41	1. Anchovy (*Stolephorus sp.*) 2. Barracuda (*Sphyreana sp.*) 3. Cavall (*Caranx sp.*) 4. Garfish (*Tylosurus sp.*) 5. Hairtail (*Trichiurus sp*) 6. Half-beak (*Hemiramphus sp.*) 7. Hardtail (*Megalaspis cordyla*) 8. Herring (*Sardinella sp.*) 9. Mackerel (*Rastrelliger sp.*) 10. Mullet (*Mugil sp.*) 11. Rabbit fish (*Siganus sp.*) 12. Shrimps (*Penaeus sp.*) 13. Slipmouth (*Leiognathus sp.*) 14. Squid (*Loligo sp.*)	Coastal waters of Calbayog City
12. Gill Net Fishing	158	1. Barracuda (*Sphyreana sp.*) 2. Croaker (*Pomadasys sp.*) 3. Crabs (*Neptunus pelagicus*) 4. Grouper (*Epinephelus sp.*) 5. Mojarra (*Gerres sp.*) 6. Moonfish (*Mene maculata*) 7. Rays (*Dasyatis sp.*) 8. Sharks (*Scoliodon sp.*) 9. Shrimps (*Penaeus sp./Metapenaeus sp.*) 10. Spanish mackerel (*Cybium sp.*) 11. Threadfish (*Alectis indicus*) 12. Tuna (*Thunnus sp.*)	Samar Sea, Coastal waters of Calbayog City
13. Squid Jigging	174	Squid (*Loligo sp.*)	Samar Sea, Coastal waters of Calbayog City
14. Drift Gill Net Fishing	193	1. Barracuda (*Sphyreana sp.*) 2. Black pomfret (*Stromateus niger*) 3. Bonito (*Euthynnus sp.*) 4. Cavalla (*Caranx sp.*) 5. Crevalle (*Caranx sp.*)	Samar Sea, Carigara Bay, Maqueda Bay, Visayan Sea.

Table 15 continued

Fishing Activities	Number of Fisherfolks Involved	Dominant Species Caught/ Collected	Fishing Grounds
		6. Garfish (*Tylosurus sp.*) 7. Hairtail (*Trichiurus sp.*) 8. Hardtail (*Megalspis cordyla*) 9. Philippine jack (*Hynnis momsa*) 10. Spanish mackerel (*Cybium sp.*) 11. Two-finned runner (*Elagatis binipinnulatus*) 12. Tuna (*Thunnus sp.*) 13. Yellowfin tuna (*Neothunnus macropterus*) 14. Yellow leather jacket (*Scomberoides lysan*)	

fishing is at sustenance level and solely for family consumption. For this study there were 46 fisherfolks involved.

(3) **Seaweeds gathering.** There were 15 reported fisherfolks who have gone into the gathering of seaweeds, particularly of the genera *Caulerpa, Gelidiella,* and *Eucheuma* at the intertidal zones of the coastal waters of Calbayog City.

(4) **Mollusks and crustaceans gleaning/gathering.** For this type of municipal fisheries activity, some gleaners/gatherers collect some species of mollusks during lowest low tides when rocks and reefs are exposed and gathering them is easy. However, for some species, such as surf clam, window-pane shell, conus shells, pen shell, and triton shells, including crustaceans such as lobsters and sand crabs which inhabit deeper areas of the sea bottoms of the coastal zones, gatherers are those fisherfolks who have the skill in diving with or without the use of underwater breathing apparatus. The gathering of mud crabs

was usually undertaken in mangrove areas using iron rods to remove them from their holes and crevices. There were 98 gleaners and gatherers of mollusks and crustaceans.

(5) **Spear fishing**. This type of fishing activity made use of spear guns to catch target fish species. This is usually done during night time with the use of underwater flashlights along coral reefs and fish shelters when fish are inactive. However, this could be done during daytime but the respondents reported that it was not quite effective compared to those undertaken at night. For this study, there were 43 spear fishers involved. Both pelagic and demersal species are caught along the coastal waters of Calbayog City and in Samar Sea.

(6) **Sea cucumber gathering**. As shown in Table 15, there were eight fisherfolks involved for this fishing activity which is the gathering of sea cucumber. The fishing areas include Samar Sea and the coastal waters of Calbayog City. Divers using air compressor gather sea cucumber of high commercial value in the coral reefs and the sandy muddy bottom.

(7) **Crab/fish/squid pot fishing**. There were 114 recorded fisherfolks who were indulged in this type of fishing activity. The dominant species caught were: blue crab, pike eel, file fish, grouper, octopus, parrot fish, squid, and wrasses. Crab/fish/squid pots were operated in Samar Sea and the coastal waters of Calbayog City.

(8) **Multiple set long line fishing**. There were 190 fisherfolks involved in this fishing activity. The gear is operated in deep water areas of Samar Sea and

the coastal waters of Calbayog using baited hooks attached to a monofilament nylon main line provided with anchor at both ends to prevent the gear from being drifted by water current. Dominant species being caught are demersal species.

(9) **Hook and line fishing.** There were 272 fisherfolks who adopted hook and line fishing in the study conducted. The fishing grounds are Samar Sea and the coastal waters. Natural and artificial baits are used to catch pelagic and demersal species. It was noted that there were 12 dominant species that are caught using hook and line.

(10) **Push net.** This type of gear is operated in shallow estuarine and mangrove areas to catch crabs and shrimps. There were 81 fisherfolks involved in this fishing activity. Usually, the volume of catch is low and used only for family consumption.

(11) **Fish corral.** Fish corral is one of the gears operated by municipal fisherfolks. In the study conducted there were 41 involved in this type of municipal fishing. Fish corrals are constructed along shallow waters . The dominant species caught include anchovy, barracuda, cavalla, garfish, hairtail, half-beak, hard tail, herring, mackerel, mullet, rabbitfish, shrimps, slipmouth, and squid. However, other fish species of low-value are likewise caught with this type of gear and used as food for cultured groupers and mud crabs.

(12) **Gill net fishing.** There were 158 muncipal fisherfolks involved in gill net fishing. Gill nets are set in the coastal waters of Calbayog City and in Samar Sea. Majority of the species caught are pelagic fishes.

(13) **Squid jigging.** As reflected in Table 15, there were 174 squid jiggers operating in Samar Sea and coastal waters of Calbayog City. Jiggs are made up of lead materials with hooks and attached to monofilament nylon lines. Squid jigging is usually undertaken during night time using gas lamps and other light attraction devices.

(14) **Drift gill net fishing.** There were 193 municipal fisherfolks who were engaged in drift gill net fishing. The dominant fish species caught are pelagic fish species. This type of fishing gear is operated in Samar Sea, Carigara Bay, Maqueda Bay, and Visayan Sea.

Profile of Commercial Fisheries

This section presents the profile of commercial fisheries of the city of Calbayog. The data presented are on the number of fisherfolks, boat used, gross tonnage, fishing grounds, and dominant species caught.

Number of commercial fisherfolks. As shown in Table 16, out of 34 barangays involved in the study, only four have fisherfolks operating in commercial fisheries. In Barangay Obrero there were 48 fisherfolk-respondents (47.06 percent), Aguit-itan with 36 respondents (35.39 percent), Carayman with

12 fisherfolk-respondents (11.77 percent), and Tomaligues with six respondents (5.88%). The total respondents that were involved in the study were 102.

Table 16

Number of Commercial Fisherfolks Involved in the Study

Barangay	Number of Commercial Fisherfolk-Respondents	Percent
1. Aguit-itan	36	35.29
2. Carayman	12	11.77
3. Obrero	48	47.06
4. Tomaligues	6	5.88
Total	**102**	**100.00**

Gear used, number of fishing fleets, average gross tonnage, major species caught, and fishing grounds for commercial fishing operations. Presented in Table 17 are the relevant data on commercial fishing operations of the respondents involved in the study. As to trawl fishing, there were 11 fishing fleets with average gross tonnage of 6.50 tons and an average number of fishing crew of 10 persons. For Danish seine fishing, there were two fishing fleets with average gross tonnage of 20.19 tons and 17 persons as average number of fishing crew. Trawl gear and Danish seine were operated in Maqueda Bay, Samar Sea, Carigara Bay, and Visayan Sea. The major species caught by these commercial fishing gears were big-eyed porgy, big-eyed scads, cardinal fish, cavalla, crevalle, crab, goatfish, grouper, hairtail, hardtail, Indian turbot, lizard fish,

nemipterid, short-bodied mackerel, shrimps, silver pike eel, slipmouth, Spanish mackerel, and stripped mackerel.

Table 17

Gear Used, Number of Fishing Fleets, Gross Tonnage, Number of Fishing Crew, Major Species Caught, and Fishing Grounds for Commercial fishing Operations Involved in the Study

Gear Used	No. of Fishing Fleet	Average Gross Tonnage	Average No. of Crew	Major Species Caught	Fishing Ground
1. Trawl	11	6.50	10	1. Big-eyed porgy (*Monotaxis sp.*) 2. Big-eyed scad (*Caranx crumenopthalmus*) 3. Cardinal fish (*Apogon sp.*) 4. Cavalla (*Caranx sp*) 5. Cavalla (*Caranx sp.*) 6. Crab (*Portunus sp.* 7. Goatfish (*Upeneoides sp.*) 8. Grouper (*Epinephelus sp.*) 9. Hairtail (*Trichiurus sp.*) 10. Hard tail (*Megalaspis cordylla*) 11. Indian turbot (*Psettodes sp.*) 12. Lizard fish (*Saurida* sp.) 13. Mojarras (*Gerres filamentosus*) 14. Nemipterid (*Nemipterus sp.*) 15. Short-Bodied macherel (*Rastrelliger brachysoma*)	1. Maqueda Bay 2. Samar Sea 3. Visayan Sea 4. Carigara Bay
2. Danish Seine	2	20.19	17		

Extent of CRM Program Implementation as Perceived by the Four Groups of Respondents

This section presents the data and discussions on the perceptions of the municipal fisherfolks, commercial fisherfolks, barangay officials, and technologists/ department managers on the extent of implementation of the various areas of concerns on CRM program implementation.

Public education. As shown in Table 18, the municipal fisherfolks described the indicators "Availability of adequate tools and materials on CRM", "Taking key community leaders to see similar problems and developments elsewhere" and "Conduct of symposia and fora on CRM" as "much implemented" with weighted means of 4.01 and 4.08, respectively. However, the adequacy of posters, leaflets, magazines and journals, radio program, local TV program CDs and cassette tapes, and T-shirts as materials to create awareness among stakeholders were rated as "moderately implemented" with weighted means which ranged from 2.55 to 3.37 while commercial papers and filmstrips were described as "slightly implemented" with weighted means of 2.02 to 2.41 .

For commercial fishers the indicators "Conduct of symposia and fora on CRM" and "Posters" posted a weighted mean of 3.62, while educational materials such as "Leaflets", "Taking key leaders to see similar projects and development elsewhere", "Magazines and journals", "CD's and cassette tapes" were described as moderately implemented. It can be observed that the other indicators were described by the respondents as "slightly implemented".

Table 18

Extent of Coastal Resource Management (CRM) Program Implementations Along Public Education as Perceived by the Four Groups of Respondents

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
I. PUBLIC EDUCATION					
Availability of adequate educational tools and materials on CRM					
1.1 Posters	3.47 MoI	3.61 MI	3.91 MI	4.50 MI	3.88 MI
1.2 Leaflets	3.35 MoI	3.46 MoI	3.61 MI	4.57VMI	3.75 MI
1.3 Magazines and journals	2.78 MoI	1.77 SI	2.38 SI	3.79MI	2.68 MoI
1.4 Radio programs	3.37 MoI	1.86 SI	2.08 SI	3.93 MI	2.81 MoI
1.5 Local TV programs	2.82 MoI	2.92 MoI	3.00 MoI	3.71 MI	3.11 MoI
1.6 CDs/cassette tapes	2.55 MoI	2.92 MoI	3.39 MoI	3.42MoI	3.07 MoI
1.7 Filmstrips	1.97 SI	1.81 SI	3.01 MoI	2.14 SI	2.23 SI
1.8 Commercial papers	2.41 SI	1.22 NI	1.86 SI	1.43 NI	1.73 SI
1.9 T-shirts	3.19 MoI	2.16 SI	1.22 NI	1.43 NI	2.35 SI
1.10 Badges and stickers	2.24 SI	2.52 MoI	2.18 SI	1.15 NI	2.02 SI
1.11 Local drama and storytelling	1.00 NI	2.62 MoI	2.41 SI	1.00 NI	1.76 SI
1.12 Taking key leaders to see similar projects and development elsewhere	4.01 MI	3.37 MoI	2.77 MoI	1.07 NI	2.81 MoI
2. Conduct symposia and for a on CRM	4.08 MI	3.62 MI	4.55 MI	3.36 MoI	3.90 MI
Area Mean	2.86 MoI	2.59 MoI	2.90 MoI	2.73 MoI	**2.77 MoI**

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much Implemented (VMI)
4	3.51 - 4.50	Much Implemented (MI)
3	2.51 - 3.50	Moderately Implemented (MoI)
2	1.51 - 2.50	Slightly Implemented (SI)
1	1.00 - 1.50	Not Implemented at all (NI)

WM - Weighted Mea I - Interpretation

Among barangay officials the indicator on the availability of adequate educational tools and materials on CRM which posted the highest weighted mean of 3.38 was "Leaflets" and described as "moderately implemented". The lowest weighted mean of 1.86 was obtained on the indicators "Commercial papers" which corresponded to "slightly implemented". "Conduct of symposia and fora on CRM" as a major activity on public education pegged a weighted mean of 2.60 and described as "moderately implemented".

For the technologists/department managers, the indicator "Leaflets" posted the highest weighted mean of 4.57 and described by the respondents as "very much implemented". As to educational materials and tools on CRM, "Posters", "Magazines and journal", "Radio program", and "Local TV program" obtained the highest weighted means of 4.50, 3.93, 3.79 and 3.71 and described as "much implemented". Other indicators were considered as "moderately implemented" with weighted means which ranged from 3.42 to 3.71.

It can be gleaned from Table that the highest combined weighted mean of the four groups of respondents under this area of concern was on the indicators "Posters" and "Leaflets" which garnered a 3.88 and 3.75 interpreted as "much implemented". The lowest weighted mean was on indicators "Local drama and storytelling" with 1.76 and "Commercial papers" with 1.73 both interpreted as "slightly implemented. The second area of concern, "Conduct of symposia and foras on CRM" got a combined weighted mean of 3.90 and was interpreted as

"much implemented". In general this area of concern was rated to be "moderately implemented".

Capability building. This table shows the perception of four groups of respondent on the extent of CRM program implementation along capability building. Among municipal fishers, the indicators on trainings conducted on "Law enforcement" (WM= 4.48), "Resource enhancement, regeneration and conservation" (WM= 4.05), and "Policies and regulations on CRM" (WM = 3.64) were rated as "much implemented". On the other hand, other concerns were described as "moderately implemented" with weighted means ranging from 2.70 to 3.47.

As regards commercial fishers, they perceived all the nine indicators on capability building as "much implemented".

Among barangay officials more specifically on trainings conducted the highest weighted mean of 2.99 and described as "moderately implemented" was on the indicator "Appropriate technology for rural communities". The lowest weighted mean of 1.79 was on the indicator "Project development and management" and described as "slightly implemented".

As to the perception of the technologists/department managers, this area of concern was rated high due to the fact that the indicators were rated "very much implemented" and "much implemented".

Table 19

Extent of Coastal Resource Management (CRM) Program Implementations Along Capability Building as Perceived by the Four Groups of Respondents

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
II. CAPABILITY BUILDING					
1. Trainings conducted on:					
1.1 Polices and regulations on CRM	3.64 MI	4.00 MI	4.18 MI	4.57 VMI	4.09 MI
1.2 Law enforcement	4.48 MI	4.06 MI	4.35 MI	4.50 MI	4.35 MI
1.3 Appropriate technologies for rural communities	3.47 MoI	3.78 MI	3.74 MI	4.79 VMI	3.95 MI
1.4 Technology transfer	3.61 MI	3.83 MI	3.67 MI	4.50 MI	3.90 MI
1.5 Resource enhancement, re-generation, and conservation	4.05 MI	3.80 MI	4.82 MI	4.21 MI	4.22 MI
Project development and Management	3.41 MoI	3.64 MI	2.47 SI	3.78 MI	3.33 MoI
Planning, monitoring and evaluation	2.70 MoI	2.52 MoI	3.01 MoI	4.14 MI	3.09 MoI
1.6 Provision of training to managers and implementers on CRM	3.27 MoI	3.60 MI	2.75 MoI	4.00 MI	3.39 MoI
Area Mean	3.58 MI	3.65 MI	3.62 MI	4.33 MI	3.80 MI

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much Implemented (VMI)
4	3.51 - 4.50	Much Implemented (MI)
3	2.51 - 3.50	Moderately Implemented (MoI)
2	1.51 - 2.50	Slightly Implemented (SI)
1	1.00 - 1.50	Not Implemented at all (NI)

WM - Weighted Mean ; I - Interpretation

The highest weighted mean of 4.79 ("very much implemented") was noted on the indicator "Trainings conducted on appropriate technology for rural communities" while the lowest weighted mean of 3.78 ("much implemented") was on indicator "Project development and management".

The indicators that obtained the highest combined weighted means were "Law enforcement" with 4.35, "Resource enhancement regeneration and conservation" with 4.22 and "Policies and regulation on CRM" with 4.09.

All respondents described this area of concern as "much implemented" obtaining a combined area mean of 3.80.

Fishery legislation and law enforcement. As regards the municipal fishers they described all the activities included in this area as "much implemented" with weighted means which ranged from 3.63 to 4.40, except on "Provision of adequate and competent numbers of law enforcers" which obtained a weighted mean of 3.49 and described as "moderately implemented". Among commercial fishers all the nine indicators on this area ranged from 2.10 to 4.30. Consequently, the area mean of 3.81 is considered "much implemented". As to the perceptions of the barangay officials the highest weighted mean of 3.67 and claimed as "much implemented" was on the indicator "Imposition of fines and penalties". However, the lowest weighted mean of 1.77 and claimed as "slightly implemented" was on the indicator "Filing of cases among violators in appropriate bodies and courts of law".

Table 20

Extent of Coastal Resource Management (CRM) Program Implementations Along Fishery Legislation and Law Enforcement as Perceived by the Four Groups of Respondents

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
III. FISHERY LEGISLATION AND LAW ENFORCEMENT					
1. Enactment of City Ordinances related to CRM	4.40 MI	4.11MI	3.51 MI	4.80 VMI	4.21 MI
2. Apprehension of violators on fishery laws, rules, and regulations	4.34 MI	4.18 MI	4.04 MI	4.71 VMI	4.32 MI
3. Imposition of sanctions	3.87 MI	4.11 MI	4.17 MI	4.71 VMI	4.22 MI
4. Imposition of fines and penalties	3.72 MI	4.30 MI	4.79 VMI	4.57 VMI	4.35 MI
5. Filing of cases among violators in appropriate bodies and courts of law	4.28 MI	2.10 SI	2.89 MoI	4.30 MI	3.54 MI
6. Provision of adequate and competent numbers of law enforcers	3.49 MoI	3.70 MI	3.06 MoI	4.10 MI	3.58 MI
7. Provision of monetary incentive for law enforcers	4.17 MI	4.10 MI	3.96 MI	4.35 MI	4.15 MI
8. Provision of adequate budgetary support for the maintenance and operation services on law enforcement	1.72 SI	4.10 MI	3.30 MoI	4.30 MI	3.36 MoI
9. Availability of legal support/Services	3.21 MoI	3.81 MI	3.53 MI	4.29 MI	3.71 MI
Area Mean	3.67 MI	3.83 MI	3.69 MI	4.50 MI	3.92 MI

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much Implemented (VMI)
4	3.51 - 4.50	Much Implemented (MI)
3	2.51 - 3.50	Moderately Implemented (MoI)
2	1.51 - 2.50	Slightly Implemented (SI)
1	1.00 - 1.50	Not Implemented at all (NI)

WM - Weighted Mean
I - Interpretation

For the technologists/department managers the highest weighted mean obtained was 4.80 on the indicator "Enactment of City Ordinances related to CRM", followed by 4.71 "Apprehension of violators on fishery laws, rules, and regulations". Both indicators were described by the respondents as "very much implemented". Other indicators were claimed as "much implemented".

Furthermore as shown in Table 20 the highest combined weighted mean was obtained by the indicator "Imposition of fines and penalties" with 4.35. It was followed by "Apprehension of violators on fishery laws, rules, and regulations" with score pegged at 4.32, followed by "Imposition of sanction" with 4.22, then by "Enactment of city ordinances related to CRM" with 4.21, then "Provision of monetary incentive for law enforcers" with 4.15, then, "Provision of adequate and competent number of law enforcers" with 3.58 and "Availability of legal support/ services" with 3.71. Majority of the indicators listed under fishery legislation and law enforcement were interpreted as "much implemented". Only one indicator which is the "Provision of budgetary support for the maintenance and operation services on law enforcement" got a combined weighted mean of 3.36 with interpretation described as "moderately implemented". All groups of respondents considered a high level of implementation of the CRM program as "much implemented" as observed on the combined area mean of 3.92.

Resource regeneration and enhancement. The municipal fisherfolks claims that the highest weighted mean of 5.00 ("very much implemented") was

recorded on "Mangrove reforestation and Installation of artificial reefs". This was followed by 4.00 ("much implemented") on "Stocking and re-stocking of communal waters" and "Re-seeding of depleted areas" described as "moderately implemented". "Slightly implemented" were those on aqua-ranching (WM = 2.38). Finally, those with the lowest weighted mean and described as "not implemented at all" were on "Sea grass transplantation" (WM = 1.45) and Coral transplantation" (WM = 1.00).

For commercial fishers, "Mangrove reforestation" posted the highest weighted mean of 4.50 , followed by "Installation of artificial reefs" with a weighted mean of 4.10, then by "Stocking and re-stocking of communal waters" with a weighted mean of 2.78 described as "moderately implemented". "Aqua ranching" and "Re-seeding of depleted areas" with weighted means of 2.73 and 2.72, respectively, were claimed by the respondents as "moderately implemented". The lowest weighted means of 1.81 and 1.80 were recorded on the indicators "Coral transplantation" and "Sea grass transplantation". For commercial fishers the area mean was pegged at 3.04 and described as "moderately implemented".

As to barangay officials' perceptions, out of seven indicators those claimed by the respondents as "much implemented" were on indicators "Installation of artificial reefs" and "Mangrove reforestation" with weighted means of 4.60 and 4.18, respectively. All other indicators were described as "slightly implemented" with weighted mean ranges of 1.61 – 1.85.

Table 21

Extent of Coastal Resource Management (CRM) Program Implementations Along Resource Regeneration and Enhancement as Perceived by the Four Groups of Respondents

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
IV. RESOURCE REGENERATION AND ENHANCEMENT					
1. Mangrove reforestation	5.00 VMI	4.50 MI	4.18 MI	5.00 VMI	4.67 VMI
2. Aqua-ranching	2.38 SI	2.73 MoI	1.68 SI	3.71 MI	2.63 MoI
3. Stocking and re-stocking of communal waters	4.00 MI	2.78 MoI	2.47 SI	5.00 VMI	3.56 MI
4. Installation of artificial reefs	5.00 VMI	4.10 MI	4.60 VMI	5.00 VMI	4.68 VMI
5. Coral transplantation	1.00 NA	1.81 SI	1.68 SI	1.00 NA	1.37 NI
6. Sea grass transplantation	1.45 NA	1.80 SI	1.85 SI	1.00 NA	1.55 SI
7. Re-seeding of depleted areas	2.66 MoI	2.72 MoI	4.18 MI	5.00 VMI	3.64 MI
Area Mean	3.07 MoI	2.92 MoI	2.95 MoI	3.67 MI	-

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much Implemented (VMI)
4	3.51 - 4.50	Much Implemented (MI)
3	2.51 - 3.50	Moderately Implemented (MoI)
2	1.51 - 2.50	Slightly Implemented (SI)
1	1.00 - 1.50	Not Implemented at all (NI)

WM - Weighted Mean ; I - Interpretation

For technologists/ department managers "Mangrove reforestation", "Stocking and re-stocking of communal waters, Re-seeding of depleted areas" and "Installation of artificial reefs" were described by the respondents as "very

much implemented" both having a weighted mean of 5.0. On the other hand, "Coral and sea grass transplantations" were claimed to be "not implemented" both with obtained mean of 1.0.

From the table above, indicators that obtain the highest combined weighted mean was on "Installation of artificial reefs" with a score of 4.68, and "Mangrove reforestation" with a score pegged at 4.67. Both indicators were interpreted as "very much implemented". Indicators "Re-seeding of depleted areas" with a combined weighted mean of 3.64 and "Stocking and re-stocking of communal waters" with a combined weighted mean of 3.56 were considered "much implemented". Indicators that obtained the lowest score are "Sea grass transplantation" and "Coral transplantation" ranging from 1.55 to 1.37 and interpreted as "slightly implemented" and "not implemented at all", respectively.

It is evident, based on the result of the data, that something must be done to improve the implementation of "Resource regeneration and enhancement" as one of the major areas in CRM.

Establishment of protected areas. Table 22 presents the perception of the four groups of respondents on the extent of CRM program implementation along establishment of protected areas. Among municipal fishers, on the establishment of marine/fish sanctuary, "Public consultation" got the highest weighted mean of 5.00 and described as "very much implemented". This was followed by the indicators "Conduct of underwater survey/assessment" (WM = 4.35),

"Legislation" (WM = 3.84), and "Delineation of area and boundary" (WM = 3.67). Other indicators were described as "moderately implemented". As far as coral reef rehabilitation and enhancement is concerned, the highest weighted mean of 4.37 was recorded on the indicator "Site Survey", followed by 3.91 on "Installation of artificial reefs" and rated as "much implemented". The lowest weighted means claimed as "slightly implemented" were obtained on the indicators "Formation of management group" (WM = 2.46) and "Transplantation of coral reef species" (WM = 1.96).

The commercial fisher-respondents considered all the activities on the "Establishment of marine/fish sanctuary" as "much implemented", except on the activity related to "Project impact monitoring" which is claimed to be "slightly implemented". On "Coral reef rehabilitation and enhancement", two out of seven activities involved were considered as "much implemented" with weighted means ranging from 3.63 – 4.40. All other activities under "Coral reef rehabilitation and enhancement" were considered "slightly implemented" and "not implemented at all".

Among barangay officials on their first major activity which was on the "Establishment of marine/fish sanctuary", the highest weighted means of 3.66 to 4.35 were pegged on the indicators "Public consultation", "Conduct of underwater survey/assessment", and "Information dissemination on the existence of fish sanctuary". The rest of the indicators obtained the weighted

Table 22

Extent of Coastal Resource Management (CRM) Program Implementation Along Establishment of Protected Areas as Perceived by the Four Groups of Respondents

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
V. ESTABLISHMENT OF PROTECTED AREAS					
1. Establishment of marine fish sanctuary					
1.2 Conduct of underwater Survey/ assessment	4.35 MI	4.20 MI	3.66 MI	4.80 VMI	4.25 MI
1.3 Legislation	3.84 MI	4.40 MI	2.1 SI	5.00 VMI	3.83 MI
1.4 Delineation of area and Boundary	3.67 MI	4.10 MI	4.35 MI	5.00 VMI	4.28 MI
1.5 Provision of markers and Buoys	3.44 MoI	3.70 MI	2.29 SI	5.00 VMI	3.61 MI
1.6 Creation of management body	2.85 MoI	3.65 MI	4.35 MI	4.10 MI	3.74 MI
1.7 Regular monitoring and surveillance of fish sanctuary	2.91 MoI	4.10 MI	3.21 MoI	3.71 MI	3.48 MoI
1.8 Information dissemination on the existence of the fish sanctuary	3.16 MoI	3.85 MI	3.66 MI	4.80 VMI	3.87 MI
1.9 Project impact monitoring	2.87 MoI	2.50 SI	4.18 MI	3.10 MoI	3.16 MoI
2. Coral reef rehabilitation and Enhancement					
2.1 Site survey	4.37 MI	3.63 MI	4.35 MI	4.00 MI	4.08 MI

Table 22 continued

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
2.2 Public consultation	3.50 MoI	2.00 SI	3.25 MoI	4.10 MI	3.21 MoI
2.3 Formation of management group	2.46 SI	2.00 SI	3.42 MoE	3.80 MI	2.92 MoI
2.4 Training of managers/leaders	2.56 MoI	2.50 SI	2.42 SI	3.64 MI	2.78 MoI
2.5 Installation of artificial reefs	3.91 MI	4.40 MI	3.77 MI	4.80 VMI	4.22 MI
2.6 Transplantation of coral reef species	1.96 SI	2.30 SI	2.4 SI	1.00 NI	1.92 SI
2.7 Monitoring and surveillance	2.75 MoI	3.43 MoI	2.48 SI	2.93 MoI	2.89 MoI
Area Mean	**3.55 MoI**	**3.21 MoI**	**3.38 MoI**	**4.03 MI**	**3.49 MoI**

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much Implemented (VMI)
4	3.51 - 4.50	Much Implemented (MI)
3	2.51 - 3.50	Moderately Implemented (MoI)
2	1.51 - 2.50	Slightly Implemented (SI)
1	1.00 - 1.50	Not Implemented at all (NI)

WM - Weighted Mean ; I - Interpretation

means which ranged from 2.10 – 3.21 and described as "slightly to moderately implemented". On the second major activity which was on "Coral reef rehabilitation and enhancement", the highest weighted mean of 4.35 was on "Site survey" and 3.77 was pegged on the indicator "Installation of artificial reefs" which both correspond to "much implemented" in terms of verbal description.

The lowest weighted mean of 2.40 and interpreted as "slightly implemented" was on indicator "Transplantation of coral reef species".

Among technologists/department managers, most specifically on the "Establishment of marine/fish sanctuary", all the major activities were rated high with weighted means from 3.71 – 5.0 which corresponded to verbal descriptions of "much implemented" to "very much implemented", except on one indicator "Project impact monitoring" which obtained a weighted mean of 3.10 and described as "moderately implemented". On the other activity which is "Coral reef rehabilitation and enhancement", the highest weighted mean of 4.80 ("very much implemented") was recorded on the indicator "Installation of coral reefs" while the lowest weighted mean of 1.00 ("not implemented at all") was on the indicator "Transplantation of coral reef species".

Alternative livelihood. The municipal fisherfolk-respondents rated: "Identification of potential sites and appropriate technology and livelihood options" as "very much implemented" with WM 5.00. "Conduct of training on appropriate technologies", "Implement livelihood project that are environment friendly and sustainable", "Conduct of resource profiling", "Conduct of regular follow-up on livelihood projects implemented by technologists involved", Establish linkage with financial institutions and agencies for financial support", and "Conduct of regular monitoring of project implemented by CRM managers" were all described as "moderately implemented".

For the commercial fishers, indicators which were categorized as "much implemented" were those related to "Established linkage with financial

Table 23

Extent of Coastal Resource Management (CRM) Program Implementations Along Alternative Livelihood as Perceived by the Four Groups of Respondents

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
VI. ALTERNATIVE LIVELIHOOD					
1. Conduct resource profiling	3.00 MoI	3.53 MI	3.67 MI	4.36 MI	3.64 MI
2. Identification of potential sites and appropriate technology and livelihood options	5.00 VMI	3.48 MoI	2.40 SI	3.93 MI	3.70 MI
3. Conduct of trainings on Appropriate technologies	4.20 MI	3.43 MoI	2.36 SI	4.60 VMI	3.65 MI
4. Establish linkage with financial institutions and agencies for financial support	2.80 MoI	2.49 SI	2.40 SI	4.00 MI	2.92 MoI
5. Implement livelihood projects that are environment-friendly and sustainable	4.05 MI	3.53 MI	4.18 MI	3.86 MI	3.91 MI
6. Conduct regular follow-ups on livelihood projects implemented by technologists involved	2.91 MoI	3.40 MoI	3.47 MoI	4.71 VMI	3.62 MI
7. Conduct regular monitoring of project implemented by CRM Managers	2.69 MoI	3.27 MoI	3.02 MoI	3.75 MI	3.18 MoI
8. Provide regular feedback to project beneficiaries on monitoring and evaluation conducted	2.31 SI	1.98 SI	3.66 MI	4.57 VMI	3.13 MoI
9. Increase areas and numbers of beneficiaries to projects that are profitable and sustainable	2.30 SI	3.35 MoI	3.00 MoI	3.79 MI	3.11 MoI
AREA MEAN	3.25 MoI	3.10 MoI	3.05 MoI	4.18 MI	3.39

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much Implemented (VMI)
4	3.51 - 4.50	Much Implemented (MI)
3	2.51 - 3.50	Moderately Implemented (MoI)
2	1.51 - 2.50	Slightly Implemented (SI)
1	1.00 - 1.50	Not Implemented at all (NI)

WM - Weighted Mean ; I - Interpretation

institutions and agencies for financial support" (WM = 3.70), and "Conduct of resource profiling" and "Implement projects that are environment-friendly and sustainable" both with weighted means of 3.53. Other activities on this area of concern were described by the respondents as "moderately implemented".

The barangay officials' responses showed that "much implemented activity" which obtained the highest weighted mean of 3.74 was on the indicator "Implement livelihood projects that are environment-friendly and sustainable. Majority of the activities indicated on this area of concern were rated as "moderately implemented" with weighted means which ranged from 2.59 – 3.02. On the other hand, those that obtained the lowest weighted means which ranged from 2.36 – 2.40 and claimed as "slightly implemented" were those related to indicators "Identification of potential sites and appropriate technology for livelihood options", "Established linkage with financial institutions and agencies for financial support", and "Conduct of training on appropriate technology".

The perceptions of the technologists/department managers respondents on alternative livelihood showed that the indicators "Conduct of regular follow-up on livelihood project implemented by technologist involved", "Conduct of training on appropriate technology", and "Provide regular feedback to project beneficiaries on monitoring and evaluation conducted" were regarded as "very much implemented" with weighted means of 4.71,4.6 and 4.57. The lowest weighted mean of 3.79 was noted on the indicator "Conduct of regular monitoring of projects implemented by CRM managers" and "Increase in

number of areas and beneficiaries to projects that are profitable and sustainable" described as "moderately implemented".

Research. Table 24 presents the perception of the four groups of respondents on the extent of CRM program implementation along research.

For the municipal fishers, the only indicator described as "very much implemented" was on assessment and inventory mangroves and inventory of fisherfolks. Other indicators on this area of concern were rated "much implemented" and "moderately implemented".

Among commercial fishers, five major activities were identified as "much implemented". Those relating to "Assessment and inventory of aquatic resources" such as "Mangroves", "Fishes", and "Corals" were regarded as "much implemented". The weighted means ranged from 3.62 – 3.70. "Assessment of seaweeds and sea grasses" was claimed to be "moderately implemented". On the "Assessment of existing habitats, such as "Coral reefs", it was regarded as "much implemented" while "Soft-bottom habitats" and "Seaweeds and sea grasses" were claimed to be "not implemented". With respect to investigation and scientific inquiry on issues and problems affecting coastal resource and its environment, "Destructive effects of upland activities on the coastal ecosystem" (WM = 3.75) corresponded to "much implemented". Other issues and problems were described as "moderately implemented". On inventory of fishing gears and fisherfolks, all the indicators were perceived by respondents as "much implemented" with weighted means of 3.55 – 4.10.

Among barangay officials, the highest weighted mean of 4.35 was on the indicator "Assessment and inventory of aquatic resources: Corals". The lowest weighted mean was pegged at 2.32 and described as "slightly implemented" was on indicator "Assessment of existing habitats (Soft bottom habitat)".

Table 24

Extent of Coastal Resource Management (CRM) Program Implementations Along Research as Perceived by the Four Groups of Respondents

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
VII. RESEARCH					
1. Assessment and inventory of aquatic resources:					
1.1 Fishes	4.00 MI	3.70 MI	3.77 MI	4.71 VMI	4.04 MI
1.2 Corals	4.50 MI	3.62 MI	4.35 MI	4.43 MI	4.23 MI
1.3 Seaweeds and sea grasses	3.36 MoI	3.28 MoI	3.66 MI	4.71 VMI	3.75 MI
1.4 Mangroves	3.50 MoI	3.60 MI	3.42 MoI	3.86 MI	3.60 MI
2. Assessment of existing habitats					
2.1 Mangroves	5.00 VMI	1.60 SI	3.33 MoI	4.43 MI	3.59 MI
2.2 Coral reefs	4.00 MI	3.52 MI	3.33 MoI	4.60 VMI	3.86 MI
2.3 Seaweeds and sea grass beds	3.36 MoI	1.00 NI	3.35 MoI	4.80VMI	3.13 MoI
2.4 Soft-bottom habitats	2.90 MoI	1.03 NI	2.32 SI	4.50 MI	2.69 MoI
2.5 Estuarine areas	2.72 MoI	1.04 NI	2.80 MoI	4.00 MI	2.64 MoI

Table 24 continued

Areas/ Indicators	Respondents' Category				Combine Mean Interpretation
	MF WMean/ Interpretation	CF WMean/ Interpretation	BO WMean/ Interpretation	D/FT WMean/ Interpretation	
3. Investigation and scientific inquiry on issues and problems affecting coastal resources and its environment:					
3.1 Resource depletion in coastal areas	2.60 MoI	2.46 SI	3.72 MI	4.21 MI	3.25 MoI
3.2 Widespread environmental damage	3.80 MI	1.98 SI	2.42 SI	4.30 MI	3.13 MoI
3.3 Destructive effect of upland activities on coastal	2.74 MoI	3.75 MI	2.51 MoI	4.00 MI	3.25 MoI
3.4 Poverty among municipal fishermen	2.92 MoI	3.50 MoI	3.66 MI	4.21 MI	3.57 MI
3.5 Low productivity in aquaculture	2.55 MoI	3.50 MoI	2.61 MoI	4.00 MI	3.17 MoI
3.6 Underutilized off-shore and economic zones	2.69 MoI	3.50 MoI	3.77 MI	3.93 MI	3.47 MoI
3.7 Inefficient utilization of fishery products	2.57 MoI	3.30 MoI	2.95 MoI	4.10 MI	3.23 MoI
4 Inventory of fishing gears					
4.1 Active fishing gears	3.39 MoI	3.80 MI	4.35 MI	3.71 MI	3.81 MI
4.2 Passive fishing gears	3.12 MoI	3.55 MI	2.47 SI	3.71MI	3.21 MoI
4.3 Municipal fishing vessels	3.27 MoI	3.80 MI	2.35 SI	4.80VMI	3.56 MI
4.4 Commercial fishing vessels	3.53 MI	3.63 MI	3.39 MoI	4.60VMI	3.79 MI
5. Inventory of fisherfolks					
5.1 Commercial fisherfolks	4.00 MI	3.82 MI	4.18 MI	5.00VMI	3.84 MI
5.2 Municipal fisherfolks	4.51 VMI	4.10 MI	3.67 MI	5.00VMI	3.91 MI
Area Mean	3.41 MoI	3.05 MoI	2.67 MoI	4.45 MI	3.39 MoI

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much Implemented (VMI)
4	3.51 - 4.50	Much Implemented (MI)
3	2.51 - 3.50	Moderately Implemented (MoI)
2	1.51 - 2.50	Slightly Implemented (SI)
1	1.00 - 1.50	Not Implemented at all (NI)

WM - Weighted Mean
I - Interpretation

Among technologist/ department managers, the respondents evaluated this area of concern with high level of implementation as observed on the weighted means of their responses which was verbally interpreted as "very much implemented" to "very much implemented". The highest weighted means of 5.00 were noted on the indicators "Inventory of active fishing gears, "Commercial fisherfolks", and "Municipal fisherfolks". The lowest weighted mean of 3.36 was on the indicator "Inventory of fisherfolks".

In general this area of concern was described by the respondents as "moderately implemented" with a combined area mean of 3.39.

Comparison of the Perception of the Four Groups of Respondents on the Extent of CRM Program Implementation

This section presents the compared perception of the municipal fisherfolks, commercial fisherfolks, barangay officials and technologist/ department managers on the implementation of the various areas of concerns of CRM program in the city of Calbayog.

Public education. As presented in Table 25, the highest average of 2.90 was noted among barangay officials with a variance of 0.52, followed by municipal fisherfolks with 2.86 and variance of 0.34, then by the department managers with 2.73 and a variance of 0.27. The lowest average was pegged at 2.59 among commercial fisherfolks with a variance of 0.22.

Table 25

Comparison on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Public Education

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	38.26	2.73	0.27
Brgy. Officials	170	493.16	2.90	0.52
Commercial Fishers	102	264.00	2.59	0.22
Municipal Fishers	363	1038.60	2.86	0.34

ANOVA

Source of Variation	SS	Df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	7.29	3	2.43	6.65	0.0002	2.62	S/Reject Ho
Within Groups	235.79	645	0.37	-	-	-	-
Total	243.08	648	-	-	-	-	-

In order to determine the significant differences on the perception among groups of respondents, analysis of variance (ANOVA) was undertaken. As shown on Table 25, the tabulated F-value was 6.65 and is higher than the critical F-value of 2.62 at 3 and 645 degrees of freedom. Therefore, the result is significant. Hence the null hypothesis that "there is no significant difference on the perception of the different groups of respondents on the extent of CRM program implementation in relation to public education" is rejected.

This means that the technologists/department managers, barangay officials, commercial fishers, and municipal fishers have different observations as

to the delivery of public education as an area of concern in CRM program implementation.

To test further in order to determine where the significant differences lay, a posteriori test through Scheffe's test was applied. Table 26 shows the result.

Table 26
Posteriori Test Using Scheffe's Test on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Public Education

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologist & Brgy. Officials	0.17	1.01	7.86	NS
Technologists & Commercial Fishers	0.14	0.65	7.86	NS
Technologists & Municipal Fishers	0.13	0.62	7.86	NS
Brgy. Officials & Commercial Fishers	0.31	16.56	7.86	S
Brgy Officials & Municipal Fishers	0.04	0.50	7.86	NS
Commercial & Municipal Fishers	0.27	15.69	7.86	S

As shown in this table the barangay officials and the commercial fisherfolks as well as the commercial fisherfolks and municipal fisherfolks differed significantly in terms of implementation of public education. The perception of barangay officials proved to be higher than that of commercial fishers. Moreover, the municipal fisherfolks' perceptions proved to be higher than that of the commercial fisherfolks.

Capability building. As to capability building, as reflected in Table 27, the highest average of 4.33 and a variance of 0.05 were obtained among department manager while the lowest average was noted among municipal fisherfolks with as value of 3.58 and a variance of 0.36. On the other hand the commercial fisherfolks and barangay officials recorded an average of 3.65 (variance=0.35) and 3.62 (variance =0.67), respectively.

Table 27

Comparison on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Capability Building

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	60.67	4.33	0.05
Brgy. Officials	170	614.92	3.62	0.67
Commercial Fishers	102	372.25	3.65	0.35
Municipal Fishers	363	1301.00	3.58	0.36

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	7.69	3	2.56	5.91	0.0006	2.62	S/Reject Ho
Within Groups	279.91	645	0.43	-	-	-	-
Total	287.60	648	-	-	-	-	-

Comparing the extent of CRM implementation relative to capability building among the four groups of respondents, results of the analysis of variance revealed that the tabulated F –value was 5.91 as compared to 2.62 critical F-value. Hence, the result is significant. Thus, the null hypothesis that "there are no significant differences on the perception of the different groups of respondents on the extent of CRM program implementation in relation to capability building" was rejected.

To test further to find out where the differences lay, Table 28 shows the result of the Posteriori test using Scheffe's test.

Table 28

Posteriori Test Using Scheffe's Test on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Capability Building

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologist & Brgy. Officials	0.71	15.16	7.86	S
Technologists & Commercial Fishers	0.68	13.24	7.86	S
Technologists & Municipal Fishers	0.75	17.63	7.86	S
Brgy. Officials & Commercial Fishers	0.03	0.13	7.86	NS
Brgy Officials & Municipal Fishers	0.04	0.43	7.86	NS
Commercial & Municipal Fishers	0.07	0.91	7.86	NS

As can be gleaned in Table 28, the result of posteriori test through Scheffe's test show that no significant difference that existed between barangay officials and commercial fisherfolks, as well as between barangay officials and municipal fisherfolks in their perception on the extent of implementation of CRM program as to capability building . Other pairs differed significantly. The highest absolute difference in mean of 0.75 was obtained between department managers and municipal fishers, followed by 0.71 between department managers and barangay officials, then by 0.68 between department managers and commercial fisherfolks.

This also means that the technologists/department managers have high level of perception than the commercial fisherfolks, barangay official and municipal fisherfolks in the implementation of CRM program relative to capability building.

Fishery legislation and law enforcement. The result of compared data on the perceptions of municipal fisherfolks, commercial fisherfolks, barangay officials, and technologists/department managers are shown Table 29.

It can be gleaned from Table 29 that the technologists/department managers obtained the highest average of 4.50 with a variance of 0.11, followed by commercial fisherfolks with an average of 3.83 and variance of 0.19, then by barangay officials with average of 3.69 and variance of 0.63, while the municipal fisherfolks got the lowest average of 3.67 and a variance of 0.38.

Table 29

Comparison on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Legislation and Law Enforcement

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	63.00	4.50	0.11
Brgy. Officials	170	626.89	3.69	0.63
Commercial Fishers	102	390.33	3.83	0.19
Municipal Fishers	363	1332.20	3.67	0.38

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	10.76	3	3.59	8.82	9.7E-06	2.62	S/Reject Ho
Within Groups	262.16	645	0.41	-	-	-	-
Total	272.93	648	-	-	-	-	-

The analysis of variance resulted in an F-tabular value of 8.82 and is higher than the critical F-value of 2.62. Therefore the result was significant. Hence, the null hypothesis that "there is no significant difference on the perception of the different groups of respondents on the extent of CRM program implementation in relation to fishery legislation and law enforcement" was rejected.

In order to determine where the differences lie a posteriori test using Scheffe's test was adopted. The result of the Scheffe's test is presented in Table 30.

Table 30 shows the result which reflected a no significant difference among barangay officials and commercial fisherfolks; barangay officials and municipal fisherfolks; and commercial fisherfolks and municipal fisherfolks. Other comparison revealed significant differences.

Table 30

Posteriori Test Using Scheffe's Test on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Fishery Legislation and Law Enforcement

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologist & Brgy. Officials	0.81	20.70	7.86	S
Technologists & Commercial Fishers	0.67	13.48	7.86	S
Technologists & Municipal Fishers	0.83	22.65	7.86	S
Brgy. Officials & Commercial Fishers	0.14	3.05	7.86	NS
Brgy Officials & Municipal Fishers	0.02	0.11	7.86	NS
Commercial & Municipal Fishers	0.16	4.97	7.86	NS

The perceptions of the technologists/ department managers proved to be higher than that of commercial fisherfolks, barangay officials and municipal fisherfolks as to CRM program implementation along fishery legislation and law enforcement.

Resource regeneration and enhancement. On this area of concern on CRM program implementation, Table 31 showed that the technologists/

department managers obtain the highest average of 3.67 followed by municipal fishers with 3.07, then by barangay officials with 2.95, while the commercial fisherfolks got the lowest average value of 2.92.

Table 31

Comparison on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Resource Regeneration and Enhancement

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	51.43	3.67	0.01
Brgy. Officials	170	502.14	2.95	0.53
Commercial Fishers	102	298.14	2.92	0.30
Municipal Fishers	363	1115.10	3.07	0.37

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	8.59	3	2.86	7.24	8.8E-05	2.62	S/Reject Ho
Within Groups	255.19	645	0.40	-	-	-	-
Total	263.78	648	-	-	-	-	-

The result of the analysis of variance (ANOVA) as shown in Table 31 is the computed value of 7.24 which is higher than the tabular F-value of 2.62. Therefore, the result is significant which led to the rejection of the null

hypothesis. Since the null hypothesis was rejected a posteriori test was administered using Scheffe's test. The result is shown in Table 32.

Table 32

Posteriori Test Using Scheffe's Test on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Resource Regeneration and Enhancement

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologist & Brgy. Officials	0.72	16.76	7.86	S
Technologists & Commercial Fishers	0.75	17.31	7.86	S
Technologists & Municipal Fishers	0.60	12.31	7.86	S
Brgy. Officials & Commercial Fishers	0.03	0.14	7.86	NS
Brgy Officials & Municipal Fishers	0.12	4.17	7.86	NS
Commercial & Municipal Fishers	0.15	4.48	7.86	NS

As shown in this table the highest mean difference was 0.75 between technologists/department managers and commercial fisherfolks, while the lowest mean difference of 0.03 was among barangay officials and commercial fishers. The perceptions of the technologists/department managers in the implementation of CRM relative to this area of concern are higher than that of municipal fisherfolks, barangays officials, and commercial fisherfolks, respectively.

On the other hand there are no significant differences on the extent of implementation relative to resource regeneration and enhancement according to the perceptions of the barangay officials and commercial fisherfolks; barangay officials and municipal fisherfolks and commercial fisherfolks and municipal fisherfolks.

Establishment of protected areas. Table 33 presents the compared perception of the different groups of respondents on the implementation of the CRM program relative to the establishment of protected areas.

From the summary of Table 33, the department managers, obtained an average of 4.03 with a variance of 0.02, followed by barangay officials with 3.38 average and a variance of 0.40, then by municipal fisherfolks with 3.35 and a variance of 0.20, and then finally by commercial fisherfolks with 3.21 with variance of 0.14.

To determine the significant difference of perceptions among groups of respondents, one way analysis of variance (ANOVA) was applied. The statistical analysis revealed that the computed F-value was 11.93 and was higher than the critical F-value of 2.62. Therefore, the result is significant.

Hence, the null hypothesis that "there is no significant difference on the perception of the different groups of respondents on the extent of CRM implementation along establishment of protected areas" is rejected.

Table 33

Comparison on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Establishment of Protected Areas

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	56.38	4.03	0.02
Brgy. Officials	170	574.31	3.38	0.40
Commercial Fishers	102	327.81	3.21	0.14
Municipal Fishers	363	1216.20	3.35	0.20

ANOVA

Source of Variation	SS	Df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	8.44	3	2.81	11.93	1.30E-07	2.62	S/Reject Ho
Within Groups	152.08	645	0.24	-	-	-	-
Total	160.52	648	-	-	-	-	-

Further statistical analysis through Scheffe's test as reflected in Table 34 showed that there was no significant difference on the perception of the barangay officials and commercial fisherfolks; barangays officials and municipal fisherfolks; and commercial fisherfolks and municipal fisherfolks in relation to establishment of protected areas.

The result which showed significant difference with regards to the perception of respondents on the implementation of establishment of protected areas in the CRM program were those of the technologists/department managers

Table 35

Comparison on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Alternative Livelihood

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	58.56	4.18	0.06
Brgy. Officials	170	519.49	3.06	0.45
Commercial Fishers	102	322.36	3.16	0.33
Municipal Fishers	363	1179.35	3.25	0.39

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	18.07	3	6.02	15.50	9.5E-10	2.62	S/Reject Ho
Within Groups	250.63	645	0.40	-	-	-	-
Total	268.71	648	-	-	-	-	-

From the compared perceptions of the four groups of respondents, result of the analysis of variance obtained an F-value of 15.50, which is higher than the critical F-value of 2.62 at 3 and 645 degrees of freedom at 0.05 level of significance. Hence, the result is significant and the null hypothesis that "there is no significant difference on the perception of the different groups of respondents on the extent of CRM implementation along alternative livelihood" is rejected.

Table 36

Posteriori Test Using Scheffe's Test on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Alternative Livelihood

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologist & Brgy. Officials	1.12	40.56	7.86	S
Technologists & Commercial Fishers	1.02	32.02	7.86	S
Technologists & Municipal Fishers	0.93	29.15	7.86	S
Brgy. Officials & Commercial Fishers	0.10	1.59	7.86	NS
Brgy Officials & Municipal Fishers	0.19	10.45	7.86	S
Commercial & Municipal Fishers	0.09	1.61	7.86	NS

Further testing through Scheffe's test, as shown in Table 36, revealed no significant difference between the perception of the barangay officials and commercial fisherfolks as well as commercial fisherfolks and municipal fisherfolks in relation to the extent of implementation of alternative livelihood. However, the remaining pairs differed significantly.

Research. Presented in Table 37 is the summary of the compared perception of the four groups of respondents on the implementation of CRM relative to research as well as the results of the analysis of variance.

From the table, it can be gleaned that the average values obtained were: 4.20 among technologists/department managers (variance = 0.02); 3.41 among

municipal fisherfolks (variance=0.22); 3.29 among barangay officials (variance=0.32); and 3.05 for commercial fishers (variance=0.22).

Table 37

Comparison on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Research

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	58.82	4.20	0.02
Brgy. Officials	170	559.41	3.29	0.32
Commercial Fishers	102	311.00	3.05	0.22
Municipal Fishers	363	1238.87	3.41	0.22

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	21.36	3	7.12	29.23	9.9E-18	2.62	S/Reject Ho
Within Groups	157.12	645	0.24	-	-	-	-
Total	178.49	648	-	-	-	-	-

In order to determine the significant differences of perceptions among groups of respondents analysis of variance (ANOVA) was applied. The results showed that the computed F-value was 29.23 and is greater than the critical F-value of 2.62. The evaluation resulted in the rejection of the null hypothesis, since the result was significant.

To determine where the significant differences lay a posteriori test through Scheffe's test is shown in Table 38.

Table 38

Posteriori Test Using Scheffe's Test on the Perceptions of the Four Groups of Respondents on the Implementation of CRM Relative to Research

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologist & Brgy. Officials	0.91	44.63	7.86	S
Technologists & Commercial Fishers	1.15	67.84	7.86	S
Technologists & Municipal Fishers	0.79	35.05	7.86	S
Brgy. Officials & Commercial Fishers	0.24	15.30	7.86	S
Brgy Officials & Municipal Fishers	0.12	6.95	7.86	NS
Commercial & Municipal Fishers	0.36	43.00	7.86	S

The data revealed that there was a significant difference on the perceptions between technologists/department mangers and barangay officials, between technologists/ department managers and commercial fishers, between technologists/ department mangers and municipal fisherfolks, between barangay officials and commercial fishers, and between commercial fishers and municipal fishers on the implementation of CRM program in relation to research. However, between barangay officials and municipal fishers, no significant difference was shown.

Moreover, the perceptions of the technologists/department managers are higher as compared to barangay officials, commercial fishers, and that of municipal fishers.

Also the perceptions of the barangay officials proved to be higher than that of commercial fishers, and finally the perceptions of commercial fishers proved to be lower than the municipal fishers'.

Relationship Between the Extent of Implementation of CRM Program as Perceived by Commercial Fisherfolks and the Different Variates

The six variates identified in the study, namely, sex, age, civil status, educational background, average family monthly income, and number of years involved in CRM were correlated with the seven areas of concern on CRM program implementation which includes public education, capability building, legislation and law enforcement, resource regeneration and enhancement, establishment of protected areas, alternative livelihood, and research. The results of the statistical analyses are presented in the succeeding tables.

Public education. The results of the correlational analysis of the perception of the municipal and commercial fisherfolks on the six identified variates are presented in Table 39.

For the municipal fisherfolks it can be gleaned from the table the correlation coefficient and fisher's t-values are: 1) sex: rxy=0.01, Fisher's t-value

= 0.10; 2) age: rxy=-03, Fisher's t-value =0.30; 3) civil status: rxy =-0.07, Fisher's t-value=0.70; 4) educational background: rxy=-0.08; Fisher's t-value=0.80; 5) average family monthly income rxy=-0.15, Fisher's t-value =1.51, and 6) number of years in CRM: rxy=0.04, Fisher's t-value =0.40.

Table 39

Relationship Between the Extent of Implementation of CRM Along Public Education and the Profile of the Fisherfolks

Profile	r_{xy}	Fisher's t_c	Tabular t-value	Evaluation
Municipal Fishers				
Sex	0.01	0.10	1.96	NS/Accepted
Age	-0.03	0.30	1.96	NS/Accepted
Civil Status	-0.07	0.70	1.96	NS/Accepted
Educational Background	-0.08	0.80	1.96	NS/Accepted
Average Family Monthly Income	-0.15	1.51	1.96	NS/Accepted
Number of Years in CRM	0.04	0.40	1.96	NS/Accepted
Commercial Fishers				
Sex	0.00	0.00	1.96	NS/Accepted
Age	0.27	2.79	1.96	S/Rejected
Civil Status	0.09	0.90	1.96	NS/Accepted
Educational Background	-0.03	0.30	1.96	NS/Accepted
Average Family Monthly Income	-0.08	0.80	1.96	NS/Accepted
Number of Years in CRM	0.10	1.00	1.96	NS/Accepted

Legend:
tc -Computed Fisher's t-value evaluated at 0.05 Level of Significance

It can be noted on Table 39 that the Fisher's t-value of the six identified variates were lesser than the critical /tabular t-value of 1.96 evaluated at .05 level of significance. Since the result was not significant, the hypothesis that "there is no significant relationship between the extent of implementation of CRM along public education and the profile of municipal fisherfolks" is accepted. This implies that the six identified variates did not affect the level of perception of the municipal fisherfolks on the extent of implementation as regards public education.

Among commercial fisherfolks the variates sex (rxy=0.00, Fisher's t-value=0.00); civil status (rxy=0.09, Fisher's t-value=0.90); educational background (rxy= -0.03, Fishers t-value=0.30); average family monthly income (rxy=-0.08, Fisher's t-value=0.80), and number of years in CRM (rxy=0.10, Fisher's t-value=1.00) posted lesser Fisher's t-values as compared to the critical/tabular value of 1.96 at 0.05 level of significance. Therefore, the null hypothesis was accepted. Meanwhile, age with a correlation coefficient of 0.27 and Fisher's t-value of 2.79 and is higher than the critical tabular F value of 1.96 at .05 level of significance. In this instance, the null hypothesis was rejected. This means that older commercial fisherfolks perceived the implementation of public education better compared to their younger counterpart.

Capability building. Table 40 presents the correlational analyses between the extent of implementation of CRM along capability building and the profiles of both municipal and commercial fisherfolks.

Table 40

Relationship Between the Extent of Implementation of CRM Along Capability Building and the Profile of the Fisherfolks

Profile	r_{xy}	Fisher's t_c	Tabular t-value	Evaluation
Municipal Fishers				
Sex	0.13	1.30	1.96	NS/Accepted
Age	0.02	0.20	1.96	NS/Accepted
Civil Status	0.09	0.90	1.96	NS/Accepted
Educational Background	-0.09	0.90	1.96	NS/Accepted
Average Family Monthly Income	0.19	1.93	1.96	NS/Accepted
Number of Years in CRM	0.15	1.51	1.96	NS/Accepted
Commercial Fishers				
Sex	0.00	0.00	1.96	NS/Accepted
Age	-0.22	2.24	1.96	S/Rejected
Civil Status	0.17	1.72	1.96	NS/Accepted
Educational Background	-0.09	0.90	1.96	NS/Accepted
Ave. Family Monthly Income	0.15	1.51	1.96	NS/Accepted
Number of Years in CRM	-0.12	1.20	1.96	NS/Accepted

Legend: tc -Computed Fisher's t-value evaluated at 0.05 Level of Significance

Among municipal fisherfolks all the identified variates have obtained fisher's t-value lesser than critical/tabular value of 1.96 at 0.05 level of significance and evaluated as not significant. These were: sex (rxy=0.13, Fisher's t-value=1.30); age (rxy= 0.02, Fishers t-value=0.20); civil status (rxy=0.09, Fisher's t-value=0.90); educational background (rxy= -0.09, Fishers t-value =0.90); average

family monthly income (rxy=0.19, Fisher's t-value =1.93), and number of years in CRM (rxy=0.15, Fisher's t-value=1.51).

Since the evaluation was not significant therefore the null hypothesis that "there is no significant relationship between the extent of implementation of CRM along capability building and the profile of municipal fisherfolks" is accepted.

Among commercial fisherfolks, the result of the correlation analysis revealed the following: sex (rxy=0.00; Fisher's t-value=0.00); age (rxy= 0.22; Fishers t-value =2.24); civil status (rxy=0.17, Fisher's t-value =1.72); educational background (rxy= 0.09, Fishers t-value =0.90); average family monthly income (rxy=-0.15, Fisher's t-value =1.51); and number of years in CRM (rxy=0.12; Fisher's t-value of 1.20).

Sex, civil status, educational background, average family monthly income, and number of year in CRM obtained numerical Fishers t-value of lesser than the critical/ tabular t-value of 1.91 at .05 level of significance which led to the acceptance of the null hypothesis since the evaluation is not significant. However, age with rxy=-0.22 and a Fisher's t value of 2.27 is greater than the critical /tabular value of 1.96 at 0.5 level of significance. Therefore, the null hypothesis is rejected. This implies that younger commercial fisherfolk respondents perceived better implementation of capability building as compared to younger respondents.

Fishery legislation and law enforcement. Shown in Table 41 are prospective factors affecting the extent of implementation of CRM program as perceived by both municipal and commercial fisherfolks along legislation and law enforcement and six identified variates.

Table 41

Relationship Between the Extent of Implementation Of CRM Along Legislation and Law Enforcement and the Profile of the Fisherfolks

Profile	r_{xy}	Fisher's t_c	Tabular t-value	Evaluation
Municipal Fishers				
Sex	0.10	1.00	1.96	NS/Accepted
Age	-0.01	0.10	1.96	NS/Accepted
Civil Status	0.07	0.70	1.96	NS/Accepted
Educational Background	0.03	0.30	1.96	NS/Accepted
Average Family Monthly Income	0.07	0.70	1.96	NS/Accepted
Number of Years in CRM	0.12	1.20	1.96	NS/Accepted
Commercial Fishers				
Sex	0.00	0.00	1.96	NS/Accepted
Age	-0.14	1.41	1.96	NS/Accepted
Civil Status	0.02	0.20	1.96	NS/Accepted
Educational Background	0.09	0.90	1.96	NS/Accepted
Average Family Monthly Income	0.13	1.30	1.96	NS/Accepted
Number of Years in CRM	0.05	0.50	1.96	NS/Accepted

Legend: tc -Computed Fisher's t-value evaluated at 0.05 Level of Significance

As can be gleaned in the table among municipal fisherfolks, the result of correlational analyses were: sex (rxy=0.10; Fisher's t-value=1.00); age (rxy= -0.01; Fishers t-value =0.10; civil status (rxy=0.07, fisher's t-value =0.70); educational background (rxy= 0.03, Fishers t-value =0.30); average family monthly income (rxy=0.07, Fisher's t-value=0.70); and number of years in CRM (rxy=0.12, Fisher's t-value of 1.20).

Among commercial fisherfolks the results of correlational analyses were the following: sex (rxy= 0.00, Fishers t-value=0.00); age (rxy= -0.14, Fishers t-value =1.41); civil status (rxy=0.02, Fisher's t-value=0.20); educational background (rxy= 0.09, Fishers t-value =0.90); average family monthly income (rxy=0.13, Fisher's t-value=1.30), and number of years in CRM (rxy=0.05, Fisher's t-value of 0.50). All the variates identified in both municipal and commercial fisherfolk respondents showed that the Fisher's t-values were lower than that of tabular t-value of 1.96 at 0.05 level of significance. This implies that the six identified variates in both municipal and commercial fisherfolks did not affect the level of perceptions on the extent of implementation of CRM along legislation and law enforcement.

Resource regeneration and enhancement. The data contained in Table 42 are the result of the correlational analyses between the perceptions of the municipal and commercial fisherfolks as well as the six identified variates. As reflected in the said table, among municipal fisherfolks, the following are the correlation coefficient derived: -0.03, - 0.06, 0.02, -0.04, -0.01, and 0.18 with

Fisher's t-value of 0.30, 0.60, 0.20, 0.40, 0.10, 1.82 for sex, age, civil status, educational background, average family income, and number of year in CRM, respectively.

Table 42

Relationship Between the Extent of Implementation of CRM Along Resource Regeneration and Enhancement and the Profile of the Fisherfolks

Profile	r_{xy}	Fisher's t_c	Tabular t-value	Evaluation
Municipal Fishers				
Sex	-0.03	0.30	1.96	NS/Accepted
Age	-0.06	0.60	1.96	NS/Accepted
Civil Status	0.02	0.20	1.96	NS/Accepted
Educational Background	-0.04	0.40	1.96	NS/Accepted
Average Family Monthly Income	-0.01	0.10	1.96	NS/Accepted
Number of Years in CRM	0.18	1.82	1.96	NS/Accepted
Commercial Fishers				
Sex	0.00	0.00	1.96	NS/Accepted
Age	0.06	0.60	1.96	NS/Accepted
Civil Status	0.03	0.30	1.96	NS/Accepted
Educational Background	0.01	0.05	1.96	NS/Accepted
Average Family Monthly Income	-0.16	1.61	1.96	NS/Accepted
Number of Years in CRM	-0.10	1.00	1.96	NS/Accepted

Legend:

tc - Computed Fisher's t-value evaluated at 0.05 Level of Significance

Moreover, the correlation coefficient derived for commercial fisherfolks were, 0.00, 0.06, 0.03, 0.01, -0.16, 0.10 with Fisher's t-value of 0.00, 0.60, 0.30, 0.05, 1.61, 1.00 for sex, age , civil status, educational background, average family monthly income , and number of years in CRM, respectively.

It can be noted that the Fisher's t-value of the six variates for both the municipal and commercial fisherfolk respondents were lesser than the critical/ tabular t-value of 1.96 at 0.05 level of significance. Hence, the result was not significant. Therefore the hypothesis that "there is no significant relation ship between the extent of implementation of CRM along resource regeneration and enhancement and the profile of the municipal and commercial fisherfolks was accepted. This implies that the personal profile of the municipal and commercial fisherfolks did not affect the level of their perceptions on the extent of implementation along resource regeneration and enhancement.

Establishment of protected areas. Presented in Table 43 are the prospective factors that could be related to the extent of implementation of CRM program along establishment of protected areas and the profile of the municipal and commercial fisherfolks.

The result of the correlational analysis among municipal fisherfolks were as follows: sex (rxy= 0.13, Fisher's t-value=1.30); age (rxy=-0.004, Fisher's t-value =0.04); civil status (rxy=0.09, Fisher's t-value=0.90); educational background (rxy=0.01, Fisher's t-value=0.10); average family monthly income (rxy=0.09,

Fisher's t-value=0.90), and number of years in CRM (rxy=0.25, Fisher's t-value 2.57).

Table 43

Relationship Between the Extent of Implementation of CRM Along Establishment of Protected Areas and the Profile of the Fisherfolks

Profile	r_{xy}	Fisher's t_c	Tabular t-value	Evaluation
Municipal Fishers				
Sex	0.13	1.30	1.96	NS/Accepted
Age	-0.004	0.04	1.96	NS/Accepted
Civil Status	0.09	0.90	1.96	NS/Accepted
Educational Background	0.01	0.10	1.96	NS/Accepted
Average Family Monthly Income	0.09	0.90	1.96	NS/Accepted
Number of Years in CRM	0.25	2.57	1.96	NS/Accepted
Commercial Fishers				
Sex	0.00	0.00	1.96	NS/Accepted
Age	0.04	0.40	1.96	NS/Accepted
Civil Status	0.07	0.70	1.96	NS/Accepted
Educational Background	-0.10	1.00	1.96	NS/Accepted
Average Family Monthly Income	-0.08	0.80	1.96	NS/Accepted
Number of Years in CRM	-0.08	0.80	1.96	NS/Accepted

Legend:
tc - Computed Fisher's t-value evaluated at 0.05 Level of Significance

The Fisher's t-value on sex, age, civil status, educational background, and average family monthly income were lesser than the critical tabular value of 1.96 at .05 level of significance. Therefore the null hypothesis was accepted. Meanwhile, on the number of years on CRM, the fisher's t-value of 2.57 was greater than the critical/ tabular t-value of 1.96 at 0.05 level of significance. Hence, the null hypothesis was rejected.

This implies that those who have longer years of experience in CRM manifested better level of evaluation on the extent of implementation along establishment of protected areas.

Among commercial fisherfolks, Table 43 reflects the results of correlational analyses as: sex (rxy= 0.00, Fisher's t-value=0.00); age (rxy=-0.04, Fisher's t-value=0.40); civil status (rxy=0.07, Fisher's t-value=0.70); educational background (rxy=-0.10, Fisher's t-value=1.00); average family monthly income (rxy=-0.08, Fisher's t-value=0.80), and number of years in CRM (rxy=-0.80, Fisher's t-value 0.80).

The result further showed that the Fishers t-values of all the identified variates were lesser than the critical tabular t-value of 1.96 at 0.05 level of significance. Hence, the result is not significance which led to the acceptance of the null hypothesis..

Alternative livelihood. The relationship among the six variates considered and the extent of implementation as perceived by the municipal and commercial fisherfolks along alternative livelihood are presented in Table 44.

Table 44

Relationship Between the Extent of Implementation of CRM Along Alternative Livelihood and the Profile of the Fisherfolks

Profile	r_{xy}	Fisher's t_c	Tabular t-value	Evaluation
Municipal Fishers				
Sex	0.13	1.30	1.96	NS/Accepted
Age	-0.02	0.20	1.96	NS/Accepted
Civil Status	0.02	0.20	1.96	NS/Accepted
Educational Background	-0.02	0.20	1.96	NS/Accepted
Average Family Monthly Income	0.07	0.70	1.96	NS/Accepted
Number of Years in CRM	0.24	2.46	1.96	S/Rejected
Commercial Fishers				
Sex	0.00	0.00	1.96	NS/Accepted
Age	0.01	0.10	1.96	NS/Accepted
Civil Status	0.06	0.60	1.96	NS/Accepted
Educational Background	-0.01	0.10	1.96	NS/Accepted
Average Family Monthly Income	-0.03	0.30	1.96	NS/Accepted
Number of Years in CRM	0.04	0.40	1.96	NS/Accepted

Legend:
tc - Computed Fisher's t-value evaluated at 0.05 Level of Significance

As gleaned from the said table, among municipal fisherfolks, the correlation coefficient on sex, age, civil status, educational background, average family monthly income and number of year in CRM are: sex (rxy= 0.13, Fisher's t-value=1.30); age (rxy=-0.02, Fisher's t-value=0.20); civil status (rxy=0.02,

Fisher's t-value=0.20); educational background (rxy=-0.02, Fisher's t-value=0.20); average family monthly income (rxy=0.07, Fisher's t-value=0.70), and number of years in CRM (rxy=0.24, Fisher's t-value=2.46). The variates which are sex, age, civil status, educational background, and average family monthly income were lesser than the critical tabular t-value of 1.96 at 0.05 level of significance.

Since the result is not significant, therefore the hypothesis that there is no significant relationship between the extent of implementation of CRM along alternative livelihood and the profile of municipal fisherfolks as to sex, age, civil status, educational background, and average monthly income" was accepted.

However as regard to number of years in CRM the rxy was =0.24 with a Fisher's t-value of 2.46. Since this is greater than the critical tabular t-value the null hypothesis was rejected. This implies that municipal fisherfolks with shorter experience in CMR have higher perception as compared to municipal fisherfolks with longer CRM experience as to implementation of CRM along alternative livelihood.

Likewise presented in Table 44 is the correlational analysis of the perception of the commercial fisherfolks on the extent of implementation along alternative livelihood on CRM implementation and the six identified variates. The correlation coefficient on sex, age, civil status, educational background, average family monthly income, and number of years in CRM were: 0.00, 0.01, 0.06, -0.01, -0.03, and 0.04 respectively. The Fisher's t-value were: sex= 0.00, age=0.10, civil status= 0.60, educational background=0.10, average family

monthly income =0.30, and number of years in CRM =0.40. All the variates related to sex, age, civil status, educational background, and average family monthly income have lesser Fisher's t- value than the critical / tabular t-value of 1.96 at 0.05 level of significance. Hence, the null hypothesis was accepted and evaluation was considered not significant. The evaluation implies that the personal profiles of the commercial fisherfolks did not affect their level of perceptions on the implementation of CRM program along alternative livelihood as an area of concerns.

Research. As reflected in Table 45 the result of the correlational analysis between the respondent perceptions on the extent of implementation of CRM program along research and the different variates.

Among municipal fisherfolks, the correlation coefficient and Fisher's t-value on sex, age, civil status, educational background, average family monthly income , and number of years in CRM were 0.16 and 1.61; -0.070 and 0.70; -0.01 and 0.10; 0.01; and 0.10, 0.04 and 0.40, 0.15 and 1.51 respectively.

Among commercial fisherfolks, the correlation coefficient and Fisher's t-value on the identified variates such as age, sex, civil status, educational background, average monthly family income, and number of years in CRM were 0.00 and 0.00, -0.04 and 0.40, 0.09 and 0.90; 0.004 and 0.04; 0.19 and 1.93; and 0.05 and 0.50, respectively. All the variates identified among municipal and commercial fisherfolks obtained Fisher's t-value lesser than the tabular/critical t-

Table 45

Relationship Between the Extent of Implementation of CRM Along Research and the Profile of the Fisherfolks

Profile	r_{xy}	Fisher's t_c	Tabular t-value	Evaluation
Municipal Fishers				
Sex	0.16	1.61	1.96	NS/Accepted
Age	-0.070	0.70	1.96	NS/Accepted
Civil Status	-0.01	0.10	1.96	NS/Accepted
Educational Background	0.01	0.10	1.96	NS/Accepted
Average Family Monthly Income	-0.04	0.40	1.96	NS/Accepted
Number of Years in CRM	0.15	1.51	1.96	NS/Accepted
Commercial Fishers				
Sex	0.00	0.00	1.96	NS/Accepted
Age	-0.04	0.40	1.96	NS/Accepted
Civil Status	0.09	0.90	1.96	NS/Accepted
Educational Background	0.004	0.04	1.96	NS/Accepted
Average Family Monthly Income	0.19	1.93	1.96	NS/Accepted
Number of Years in CRM	0.05	0.50	1.96	NS/Accepted

Legend:
tc - Computed Fisher's t-value evaluated at 0.05 Level of Significance

value of 1.96 at .05 level of significance. Therefore the hypothesis that "there is no significant relationship between the extent of implementation of CRM along research and the profile of municipal and commercial fisherfolks" is accepted, since the result in not significant. This implies that the profile of municipal and

commercial fisherfolks did not affect the level of their perception on the extent of implementation of research as an area of concern on CRM.

Relationship Between the Extent of Implementation of CRM Program as Perceived by Technologists/ Department Managers and the Different Variates

To find out what factors are related to the extent of implementation of the CRM program, this study identified six variates, namely: sex, age, civil status, educational background, average monthly family income, and number of year in CRM. These variates were correlated with seven areas of concerns such as public education, capability building, legislation and law enforcement, resource regeneration and enhancement, establishment of protected areas, alternative livelihood, and research.

Public education. Table 46 shows the results of the correlation analyses of the department managers on the extent of implementation of the CRM program and the six identified variates along public education.

As gleaned from the table the computed product-moment correlation coefficient and Fisher's t-value of extent of implementation as well as age, sex, civil status, educational background, average family monthly income, and number of year in CRM are 0.13 and 1.30; 0.10 and 1.00; 0.14 and 1.41; 0.44 and 4.88; 0.68 and 9.23; and 0.34 and 3.60 respectively. Fisher's t-value of age, sex, and civil status were found to be numerically lesser than the critical tabular t-value of

2.06 at 0.05 level of significance and at 26 degrees of freedom. Therefore, the hypothesis is accepted since the evaluation in not significant.

Table 46
Relationship Between the Extent of Implementation of CRM Along Public Education and the Profile of the Technologists

Profile	r_{xy}	Fisher's t_c	Evaluation
Sex	0.13	1.30	NS/Accepted
Age	0.10	1.00	NS/Accepted
Civil Status	0.14	1.41	NS/Accepted
Educational Background	0.44	4.88	S/Rejected
Average Family Monthly Income	0.68	9.23	S/Rejected
Number of Years in CRM	0.34	3.60	S/Rejected

Legend:
tc -Computed Fisher's t-value evaluated at 0.05 Level of Significance, df = 26; Critical t-value = 2.06

Meanwhile, the remaining variates which were educational background, average family monthly income, and number of years in CRM obtained numerical fishers t-value which were higher than the critical /tabular t-value, therefore , the hypothesis was rejected. The evaluation resulted to be significant.

This implies that those who have higher educational qualifications, those who have higher average monthly income, and those who have longer years of experience in CRM manifested higher level of perception on the extent of implementation of the CRM program. On the other hand age, sex, and civil

status had nothing to do with the level of implementation along public education.

Capability building. The relationship between the technologist six variates considered and the extent of implementation of CRM along capability building are presented in Table 47.

Table 47

Relationship Between the Extent of Implementation of CRM Along Capability Building and the Profile of the Technologists

Profile	r_{xy}	Fisher's t_c	Evaluation
Sex	0.10	1.00	NS/Accepted
Age	-0.46	5.15	S/Rejected
Civil Status	0.45	5.01	S/Rejected
Educational Background	-0.16	1.61	NS/Accepted
Average Family Monthly Income	-0.19	1.93	NS/Accepted
Number of Years in CRM	-0.38	4.09	S/Rejected

Legend:
tc - Computed Fisher's t-value evaluated at 0.05 Level of Significance, df = 26; Critical t-value = 2.06

From the table, the correlation coefficient and the fishers t-value on sex, age, civil status, educational background, average family monthly income and number of year in CRM are 0.10 and 1.00; -0.46 and 5.15; 0.45 and 5.01; 0.16 and 1.61; 0.19 and 1.93; and 0.38 and 4.09, respectively. Sex, educational background,

and average family monthly income obtained Fisher's t-value of which is lower than the critical / tabular t-value of 2.06 at .05 level of significance and at 26 degrees of freedom. Therefore the result is not significant which resulted in the acceptance of the null hypothesis.

However, age, civil status, and number of year in CRM obtained a Fisher's t-value which numerically is higher than the critical / tabular t-value. Therefore the hypothesis was rejected.

This implies that those who were younger, those who were married , and those who have shorter experience in CRM have manifested better implementation of capability building as areas of concern in the CRM program.

Legislation and law enforcement. Along these areas of concern, the results of the correlation analyses of the technologists/department managers and the six variates on the extent of CRM implementation are reflected in Table 48.

The following are the correlation coefficient and the Fisher's t values derived : 1) sex (rxy=0.21, Fisher's t-value = 2.14); 2) age (rxy=-03, Fisher's t-value =0.30); 2) civil status (rxy =0.07, Fisher's t-value=0.70); 4) educational background (rxy=-0.64, Fisher's t-value=8.29); 5) average family monthly income (rxy=0.54, Fisher's t-value =6.38), and 6) number of years in CRM (rxy=0.18; fisher's T-value =1.82).

Moreover, the Fisher's t-value for the three out of six considered variates, viz: age, civil status, and number of years in CRM were lesser than the critical / tabular t-value of 2.06 at .05 level of significance and df=26, while the remaining

variates which are sex, educational background, and average monthly income have greater numerical Fisher's t- value compared to the critical / tabular t-value. Thus the null hypothesis was rejected.

Table 48

Relationship Between the Extent of Implementation of CRM Along Legislation and Law Enforcement And the Profile of the Technologists

Profile	r_{xy}	Fisher's t_c	Evaluation
Sex	0.21	2.14	S/Rejected
Age	0.11	1.10	NS/Accepted
Civil Status	0.07	0.70	NS/Accepted
Educational Background	0.64	8.29	S/Rejected
Average Family Monthly Income	0.54	6.38	S/Rejected
Number of Years in CRM	0.18	1.82	NS/Accepted

Legend:

tc . Computed Fisher's t-value evaluated at 0.05 Level of Significance, df = 26; Critical t-value = 2.06

Therefore, among the six variates, only sex, educational background and average family income turned out to be directly proportional to the level of the extent of CRM implementation along legislation and law enforcement. Therefore the technologists/department managers who were females, those with higher educational attainment and those with higher average family monthly income

have better level of perception on the implementation along legislation and law enforcement as an area of concern in CRM program.

Resource regeneration and enhancement. The relationship between the extent of implementation as perceived by the technologist and department managers on resource regeneration and enhancement versus the six variates, namely: sex, age, civil status, educational background, average family monthly income and number of year in CRM are presented in Table 49.

Table 49

Relationship Between the Extent of Implementation of CRM Along Resource Regeneration and Enhancement and the Profile of the Technologists

Profile	r_{xy}	Fisher's t_c	Evaluation
Sex	0.47	5.30	S/Rejected
Age	0.20	2.03	NS/Accepted
Civil Status	-0.48	5.44	S/Rejected
Educational Background	0.03	0.30	NS/Accepted
Average Family Monthly Income	-0.31	3.24	S/Rejected
Number of Years in CRM	-0.12	1.20	NS/Accepted

Legend:
tc . Computed Fisher's t-value evaluated at 0.05 Level of Significance, df = 26; Critical t-value = 2.06

As shown in the table, the correlation coefficient are 1) sex (rxy=0.47); 2) age (rxy=-0.20); 3) civil status (rxy =-0.48); 4) educational background (rxy=-

0.03); 5) average family monthly income (rxy=-0.31), and 6) number of years in CRM (rxy=0.12). The Fisher's t-value were 5.30, 2.03, 5.44, 0.30, 3.24, and 1.20 on sex , age, civil status, educational background, average family income, and number of years in CRM, respectively.

It can be noted that sex, civil status, and average family monthly income, fisherfolks obtains t-value higher than the computed Fisher's t –value of 2.06 at 0.5 level of significance and df 26 which resulted in the rejection of the null hypothesis. This implies that those who were single and those with lower average family monthly income perceived higher level of extent of implementation along resource regeneration and enhancement.

Establishment of protected areas. The relation between the sex, age, civil status, educational background, average monthly income and number of years in CRM and the extent of implementation relative to establishment of protected areas are presented in Table 50.

As can be gleaned in the table, the results of correlation coefficient and Fisher's t-test values are sex (rxy=-0.20, Fisher's-t =2.03); age (rxy=-0.30, Fisher's t- value=3.13); civil status (rxy=0.16, Fisher's t-value=1.61); educational background (rxy=-0.48, Fisher's t- value= 5.44); average family monthly income (rxy=-0.44, Fisher's t-value=4.88), and number of years in CRM (rxy=-0.55, Fisher's t value=6.55).

Out of the six variates, only two which are sex and civil status obtained Fisher's t-value lower than the critical tabular t-value of 2.06 at .05 level of significance and 26 degrees of freedom.

Table 50

Relationship Between the Profile of the Technologist and the Extent of Implementation of CRM in Calbayog City Along Establishment of Protected Areas

Profile	r_{xy}	Fisher's t_c	Evaluation
Sex	-0.20	2.03	NS/Accepted
Age	-0.30	3.13	S/Rejected
Civil Status	0.16	1.61	NS/Accepted
Educational Background	-0.48	5.44	S/Rejected
Average Family Monthly Income	-0.44	4.88	S/Rejected
Number of Years in CRM	-0.55	6.55	S/Rejected

Legend:
tc - Computed Fisher's t-value evaluated at 0.05 Level of Significance, df = 26; Critical t-value = 2.06

However, age, educational background, average family monthly income, and number of year in CRM obtained Fisher's t-values which were higher than the critical / tabular t-value which led to the rejection of the null hypothesis. Hence, the results were significant.

From the evaluation, this implies that the younger respondents, those who have lower educational attainment, those with lower average monthly in come,

and those with few years of experience in CRM have higher levels of perception on the implementation of CRM along establishment of protected areas.

Alternative livelihood. Shown in Table 51 are the prospective factors affecting alternative livelihood along technologists/ department managers.

Result of the correlational analyses are as follows: 1) sex (rxy=-0.09, Fisher's t- value=0.90); 2) age (rxy =-0.42, Fisher's t –value=4.60); 3) civil status (rxy=0.09, Fisher's t-value= 0.90); 4) educational background (rxy=-0.13, Fisher's t-value=1.30); 5) average family monthly income (rxy=0.04, Fisher's t-value=0.40), and 6) number of years in CRM (rxy=-16, Fisher's t-value =1.61).

Table 51

Relationship Between the Extent of Implementation of CRM Along Alternative Livelihood and the Profile of the Technologists

Profile	r_{xy}	Fisher's t_c	Evaluation
Sex	-0.09	0.90	NS/Accepted
Age	-0.42	4.60	S/Rejected
Civil Status	0.09	0.90	NS/Accepted
Educational Background	-0.13	1.30	NS/Accepted
Average Family Monthly Income	0.04	0.40	NS/Accepted
Number of Years in CRM	-0.16	1.61	NS/Accepted

Legend:

tc - Computed Fisher's t-value evaluated at 0.05 Level of Significance, df = 26; Critical t-value = 2.06

It can be noted that the Fisher's t-values generated from sex, civil status, educational background, average family monthly income, and number of years in CRM were lesser than the tabular f-value of 2.06 at .05 level of significance and 26 degrees of freedom. This led to the acceptance of the hypothesis that "there is no significant relationship between the respondents' perception on the extent of implementation along alternative livelihood and their sex, civil status, educational background, average monthly income and number of year in CRM". Therefore, these five considered variates did not affect the level of perception on the extent of implementation of alternative livelihood as perceived by the department managers.

Meanwhile, it can be gleaned from the same table that the Fishers t-value referring to age was greater than the corresponding critical / tabular t-value of 2.06 at .05 level of significance and 26 degree of freedom. Hence, the null hypothesis was rejected since the result was significant. Thus, those who were younger perceived alternative livelihood as an area of concern to be better implemented compared to their older counterpart.

Research. Presented in Table 52 is the relationship between the extent of implementation of CRM along research and the profile of the technologist and department managers.

The seven variates are sex (rxy=-0.10, Fisher's t-value= 1.00); age (rxy =-0.15, Fisher's t -value=1.57); civil status (rxy=0.00, Fisher's t-value=0.00); educational background (rxy=-0.05, Fisher's t-value=0.50), and average family

monthly income (rxy=0.02, Fisher's t-value=0.20). These variates obtained lower Fisher's t-value of 2.06 at .05 level of significance and degrees of freedom of 26, therefore, the hypothesis that "there is no significant relationship between the extent of implementation of CRM along research and sex, age, civil status, educational background, and average family monthly income" was accepted since the result was not significant.

Table 52
Relationship Between the Extent of Implementation of CRM Along Research and the Profile of the Technologists

Profile	r_{xy}	Fisher's t_c	Evaluation
Sex	-0.10	1.00	NS/Accepted
Age	0.15	1.51	NS/Accepted
Civil Status	0.00	0.00	NS/Accepted
Educational Background	0.05	0.50	NS/Accepted
Average Family Monthly Income	0.02	0.20	NS/Accepted
Number of Years in CRM	-0.35	3.72	S/Rejected

Legend:
tc . Computed Fisher's t-value evaluated at 0.05 Level of Significance, df = 26; Critical t-value = 2.06

Meanwhile, number of year in CRM as shown in the table with Fisher's t-value of 3.72 (rxy=-0.35) which was greater than the critical / tabular t value of 2.06, resulted in the rejection of the null hypothesis. This means that those who

have lower years of CRM experience have better perceptions of CRM implementation compared to those who have longer years of CRM experience.

Extent of Problems Encountered in the Implementation of Coastal Resource Management (CRM) Program

This part presents and discusses the perceptions of the four groups of respondents on the problems encountered in the implementation of the CRM program. The data are shown in the succeeding tables (Tables 52-55) with their corresponding discussions.

Public education. Table 53 shows the extent of problems encountered on CRM program implementation as perceived by the four groups of respondents relative to public education. As regards to the perceptions of the municipal fisherfolks, the highest weighted mean was pegged at 3.32 ("moderately a problem") on "Inadequate educational materials on CRM". This was followed by "Lack of educational awareness among stakeholders on the importance of CRM" and "Lack of competent personnel to carry out educational activities on CRM" with a weighted mean of 1.45 and described as "slightly a problem". The lowest weighted mean which pegged at 2.35 and described as "not a problem" was on the indicator "on the adequacy of educational tools and materials on CRM".

Table 53

Extent of Problems Encountered on Coastal Resource Management (CRM) Implementation Relative to Public education as Perceived by the four groups of Respondents

Problem Areas	Respondents' Perceptions				Combined Mean	Interpret-ation
	MF W/Mean	CF W/Mean	BO W/Mean	T/DM W/Mean		
	Interpret-ation	Interpret-ation	Interpret-ation	Interpretatio n		
I. PUBLIC EDUCATION						
1. Inadequate educational tools and materials on CRM	3.32	3.73	2.18	3.07	3.07	MoA P
2. Lack of educational awareness among stakeholders on the importance of CRM	1.45	2.50	1.44	1.00	1.59	SAP
3. Lack of competent personnel to carry out educational activities on CRM	1.72	1.36	4.15	1.72	2.24	SAP
Area Mean	2.16	2.53	2.59	1.93	2.30	SAP

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much a Problem (VMAP)
4	3.51 - 4.50	Much a Problem (MAP)
3	2.51 - 3.50	Moderately a Problem (MoAP)
2	1.51 - 2.50	Slightly a Problem (SAP)
1	1.00 - 1.50	Not a Problem at all (NAP)

WM - Weighted Mean ; I - Interpretation

For commercial fishers the highest weighted mean of 3.73 ("much a problem") was pegged on the indicator "Inadequate educational materials on CRM". This was followed by "Lack of educational awareness among stakeholders on the implementation of CRM" with a weighted mean of 2.50 ("slightly a problem"). The lowest weighted mean of 1.36 ("not a problem") was

recorded on the indicator "Lack of competent personnel to carry out educational activities on CRM".

The barangay officials claimed that the indicator "Lack of competent personnel to carry out educational activities on CRM" was rated as "much a problem" (WM- 4.15), "Inadequate educational materials on CRM (WM 2.18) as "slightly a problem", and "lack of educational awareness among stakeholder on the importance of CRM."

Among technologists/department mangers the indicator with weighted mean of 3.07 and described as "moderately a problem" was on "Inadequate educational materials on CRM" while the remaining two indicators were considered "slightly a problem" and "not a problem at all" with weighted means of 1.72 – and 1.00.

It can be gleaned from the table that the indicator on "Inadequate educational tools and materials on CRM" has obtained a combined mean of 3.07 described as "moderately a problem". It was followed by "Lack of competent personnel to carry out educational activities on CRM" with 2.24 and "Lack of educational awareness among stakeholders on the importance of CRM" with 1.59, both described as "slightly a problem".

In general, the obtained area mean was 2.30 which also means that the respondents perceived public education to be" slightly a problem".

Capability building. This table presents the perception of the different groups of respondents along capability building. As regards municipal fishers,

Table 54

Extent of Problems Encountered on Coastal Resource Management (CRM) Implementation Relative to Capability Building as Perceived by the four groups of Respondents

Problem Areas	Respondents' Perceptions				Combined Mean Interpret-ation
	MF W/Mean Interpretation	CF W/Mean Interpretation	BO W/Mean Interpretation	T/DM W/Mean Interpretation	
II. CAPABILITY BUILDING					
1. Lack of opportunities to attend Trainings, seminars, and other capability building activities related to CRM	3.37 MoAP	3.22 MoAP	2.44 SAP	2.93 MoAP	2.99 MoAP
2. Inadequate number of personnel locally trained to carry out capability building activities	2.24 SAP	1.51 SAP	2.08 SAP	3.86 MAP	2.42 SAP
3. Inadequate financial resources for capability building activities	3.21 MoAP	3.62 MAP	3.97 MAP	2.50 SAP	3.32 MoAP
4. Low morale of program implementers on CRM	1.97 SAP	2.90 MoAP	2.41 SAP	1.57 SAP	2.21 SAP
5. Inadequate technical skills among program implementers on CRM	1.45 NAP	2.20 SAP	2.90 MoAP	1.29 NAP	1.96 SAP
AREA MEAN	2.14 SAP	2.69 MoAP	2.76 MoAP	2.43 SAP	2.58 MoAP

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much a Problem (VMAP)
4	3.51 - 4.50	Much a Problem (MAP)
3	2.51 - 3.50	Moderately a Problem (MoAP)
2	1.51 - 2.50	Slightly a Problem (SAP)
1	1.00 - 1.50	Not a Problem at all (NAP)

WM - Weighted Mean ; I - Interpretation

the indicators which were rated as "moderately a problem" were: "Lack of opportunities to attend trainings, seminars, and other capability building activities related to CRM" (WM =3.37), and "Inadequate financial resources for capability building activities" (WM3.21). This was followed by "Inadequate number of personnel locally trained to carry out capability building activities" (WM = 2.24) and interpreted as "slightly a problem". "Low morale of program implementers on CRM" obtained a weighted mean of 1.97 and considered as "moderately a problem". The lowest weighted mean of 1.45 and described as "slightly a problem" was on indicator "Inadequate technical skills among program implementers on CRM".

For the commercial fishers, the indicator considered "much a problem" which obtained the highest weighted mean of 3.62 was "Inadequate financial resources for capability building activities". On the other hand, the indicator considered "slightly a problem" which obtained the lowest weighted mean of 2.20 was "Inadequate number of personnel locally trained to carry out capability building activities".

As to barangay officials the highest weighted means were observed on the indicators "Inadequate financial resources for capability building activities" (WM= 3.97), and "Inadequate technical skills among program implementers on CRM". The lowest weighted mean of 2.08 ("slightly a problem") was obtained on the indicator "Inadequate number of personnel locally trained to carry out capability building activities related to CRM".

For the technologists/department managers, "Inadequate number of personnel locally-trained to carry out capability building activities" (WM = 3.86) was considered by the respondents as "much a problem". "Lack of opportunities to attend trainings, seminars, and other capability building activities related to CRM" (WM = 2.93) was described as "moderately a problem". "Inadequate financial resources for capability building activities and "Low morale of program implementers on CRM" were rated as "slightly a problem". However, considered "not a problem at all" was the indicator "Inadequate technical skills among program implementers on CRM" with a weighted mean of 1.29.

It can be noted that, the indicators "Inadequate financial resources for capability building activities" and "Lack of opportunities to attend trainings and seminars and other capability building activities related to CRM" obtained a combined mean of 3.32 and 2.99 and interpreted as 'moderately a problem". All other indicators like "Inadequate number of personnel locally trained to carry out capability building activities", "Low morale of program implementers on CRM", and "Inadequate technical skill among program implementers on CRM" got the combined mean of 2.42, 2.21, and 1.96, respectively and interpreted as 'slightly a problem". For this problem area, the obtained area mean was 2.58 which also means that respondents perceived capability building to be "moderately a problem".

Fishery legislation and law enforcement. As to the perception of the municipal fisherfolks on fishery legislation and law enforcement, the highest

weighted mean of 2.91 and described as "much a problem" was on the indicator "Inadequate facilities and materials for efficient patrolling of the designated areas". The lowest weighted mean of 1.45 and claimed by the respondents as "slightly a problem" was on the indicator "Inadequate personnel to enforce the law on fisheries".

For commercial fishers, the respondents described the activities included as "moderately a problem" and "slightly a problem" with the highest weighted mean of 3.71 on the indicator "Lack of legal support to personnel involved in pursuing cases in courts among violators". The lowest weighted mean of 1.60 was noted on the indicator "Non-enactment of local ordinances on CRM".

Among barangay officials, the respondents regarded two highest indicators as "moderately a problem". These were on "Leniency of personnel in charge in the enforcement of fishery laws" and "Political intervention". Both obtained 3.37. The lowest indicator and considered as "slightly a problem" with a weighted mean of 1.68 was on "Non-enactment of local ordinances on CRM".

Among technologists/department managers, identified as "very much a problem" was the indicator "Poor cooperation among stakeholders to pursue cases on violators in courts and appropriate bodies" which posted the highest weighted mean of 4.57. Indicators that have lower scores were "Non-enactment of fishery ordinance related to CRM", and "Leniency of personnel in charge in the enforcement of laws" which both obtained a weighted mean of 1.07 and described as "not a problem at all".

Table 55

Extent of Problems Encountered on Coastal Resource Management (CRM) Implementation Relative to Fishery Legislation and Law Enforcement as Perceived by the four groups of Respondents

Problem Areas	Respondents' Perceptions				Combined Mean Interpretation
	MF W/Mean Interpretation	CF W/Mean Interpretation	BO W/Mean Interpretation	T/DM W/Mean Interpretation	
III. FISHERY LEGISLATION AND LAW ENFORCEMENT					
1. Non-enactment of local ordinance on CRM	1.74 SAP	2.75 MoAP	1.68 SAP	1.07 NAP	1.81 SAP
2. Poor implementation of ordinances, rules, and regulations on CRM and fisheries conservation	1.96 SAP	3.03 MoAP	1.94 SAP	3.36 MoAP	2.57 MoAP
3. Leniency of personnel in-charge in the enforcement of fishery laws	2.69 MoAP	2.45 SAP	3.47 MoAP	1.07 NAP	2.42 SAP
4. Political intervention	2.82 MoAP	1.68 SAP	3.47 MoAP	4.29 MAP	3.06 MoAP
5. Lack of coordination among agencies/units on law enforcement	1.97 SAP	2.50 SAP	2.08 SAP	1.79 SAP	2.08 SAP
6. Inadequate facilities, supplies, and materials for efficient patrolling of designated areas	2.91 MoAP	2.43 SAP	3.01 MoAP	4.50 MAP	3.21 MoAP
7. Poor cooperation among stakeholders to pursue cases on violators in courts and other appropriate bodies	1.47 SAP	3.40 MoAP	2.13 SAP	4.57 VMAP	2.89 MoAP
8. Inadequate personnel to enforce the laws on fisheries	2.85 MoAP	2.40 SAP	1.77 SAP	4.29 MAP	2.83 MoAP

Table 55 continued

Problem Areas	Respondents' Perceptions				Combined Mean Interpretation
	MF W/Mean Interpretation	CF W/Mean Interpretation	BO W/Mean Interpretation	T/DM W/Mean Interpretation	
9. Lack of legal support to personnel involved in pursuing cases in courts among violators	3.79 MAP	3.71 MAP	3.01 MoAP	4.15 MAP	3.66 MAP
10. Inadequate knowledge among local personnel in filing appropriate complaint and cases to violators	1.96 SAP	2.40 SAP	1.94 SAP	4.50 MAP	2.70 MoAP
Area Mean	2.18 SAP	2.58 MoAP	3.75 MAP	3.36 MoAP	2.72 MoAP

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much a Problem (VMAP)
4	3.51 - 4.50	Much a Problem (MAP)
3	2.51 - 3.50	Moderately a Problem (MoAP)
2	1.51 - 2.50	Slightly a Problem (SAP)
1	1.00 - 1.50	Not a Problem at all (NAP)

WM - Weighted Mean ; I - Interpretation

It can noted in Table 55 that based on the responses of the four groups of respondents the highest combined mean of 3.66 was obtained on the indicator "Lack of legal support to personnel involved in pursuing cases in courts among violators". This indicator was described as "much a problem". It is followed by "Inadequate facilities, supplies and materials for efficient patrolling of designated areas", 3.21, then by "Political intervention" 3.06, "Poor cooperation among stakeholders to pursue cases on violators in courts and other appropriate bodies"2.89, "Inadequate personnel to enforce the law on fisheries"2.83, "Inadequate knowledge among local personnel in filing appropriate

implement resource regeneration and enhancement projects" were considered "slightly a problem".

Table 56

Extent of Problems Encountered on Coastal Resource Management (CRM) Implementation Relative to Resource Regeneration and Enhancement as Perceived by the four Groups of Respondents

Problem Areas	RESPONDENTS' PERCEPTIONS				Combined Mean Interpretation
	MF W/Mean Interpretation	CF W/Mean Interpretation	BO W/Mean Interpretation	T/DM W/Mean Interpretation	
IV. RESOURCE REGENERATION AND ENHANCEMENT					
1. Inadequate knowledge on Resource regeneration and enhancement	1.96 SAP	1.81 SAP	1.86 SAP	3.65 MAP	2.32 SAP
2. Problem on delineation of Areas	2.34 SAP	2.38 SAP	2.89 MoAP	1.36 NAP	2.24 SAP
3. Inadequate budgetary resources	2.01 SAP	3.73 MAP	3.21 MoAP	2.50 SAP	2.86 MoAP
4. Lack of trained personnel to implement resource regeneration and enhancement projects	2.69 MoAP	2.80 MoAP	2.41 SAP	2.93 MoAP	2.71 MoAP
Area Mean	**2.25 SAP**	**2.68 MoAP**	**2.59 MoAP**	**2.61 MoAP**	**2.53 MoAP**

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much a Problem (VMAP)
4	3.51 - 4.50	Much a Problem (MAP)
3	2.51 - 3.50	Moderately a Problem (MoAP)
2	1.51 - 2.50	Slightly a Problem (SAP)
1	1.00 - 1.50	Not a Problem at all (NAP)

WM - Weighted Mean ; I - Interpretation

For the technologists/department managers, indicators described as "much a problem" were "Inadequate knowledge on resource regeneration and enhancement" with weighted mean of 3.65. "Lack of trained personnel to implement resource regeneration and enhancement projects" (WM =2.93) were rated "moderately a problem". "Inadequate budgetary resources" and "Problem on delineation of areas" posted a weighted mean of 1.36 and described as "not a problem at all".

The highest combined mean was obtained by the indicators "In-adequate budgetary resources" with 2.86, and "Lack of trained personnel to implement resource regeneration and enhancement projects with 2.71. These indicators were described as "moderately a problem". Other indicators under this area of concern were all described as "slightly a problem". The respondents generally described this area to be "moderately a problem as supported by the accrued area mean of 2.53.

Establishment of protected areas. Relative to the establishment of protected areas, the municipal fisher respondents claimed that "Inadequate technical capabilities on the formulation of local ordinances" and all other indicator were described as "slightly a problem" with weighted mean of 2.42, 1.97. 172 and 1.69 respectively.

As to commercial fishers' perceptions all indicator were rated as "slightly a problem" with weighted means 2.42, 2.22, 2.05 and 2.03.

Table 57

Extent of Problems Encountered on Coastal Resource Management (CRM) Implementation Relative to Establishment of Protected Areas as Perceived by the four Groups of Respondents

Problem Areas	RESPONDENTS' PERCEPTIONS				Combined Mean Interpret-ation
	MF W/Mean Interpretation	CF W/Mean Interpretation	BO W/Mean Interpretation	T/DM W/Mean Interpretation	
V. ESTABLISHMENT OF PROTECTED AREAS					
1. Problem on delineation of Boundaries	1.97 SAP	2.22 SAP	1.68 SAP	2.36 SAP	2.05 SAP
2. Inadequate technical Capabilities on the formulation of local ordinances	2.42 SAP	2.03 SAP	2.69 MoAP	1.15 NAP	2.07 SAP
3. Lack of cooperation among stakeholders on the maintenance of established protected areas	1.72 SAP	2.42 SAP	1.77 SAP	1.21 NAP	1.78 SAP
4. Poor enforcement of laws, rules, and regulations on the preservation of established protected areas	1.69 SAP	2.05 SAP	2.38 SAP	1.43 NAP	1.88 SAP
AREA MEAN	1.93 SAP	2.18 SAP	2.13 SAP	1.54 SAP	1.95 SAP

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much a Problem (VMAP)
4	3.51 - 4.50	Much a Problem (MAP)
3	2.51 - 3.50	Moderately a Problem (MoAP)
2	1.51 - 2.50	Slightly a Problem (SAP)
1	1.00 - 1.50	Not a Problem at all (NAP)

WM - Weighted Mean ; I - Interpretation

For barangay officials, the respondents claimed "Inadequate technical capabilities on the formulation of local ordinances" were described as

"moderately a problem" with a weighted mean of 2.69. Other indicators were verbally described as "slightly a problem".

Among technologists/department managers, the highest weighted mean of 2.36 ("slightly a problem") was on indicator "Problem on delineation of boundaries". The rest of the listed indicators were verbally described as "not a problem at all". These were on "Poor enforcement of laws, rules, and regulations on the preservation of established protected areas" (WM = 1.43), Lack of cooperation among stakeholder on the maintenance of established protected areas" and "Inadequate technical capabilities on the formulation of local ordinances" (WM = 1.15).

As can be gleaned in the Table 57 on the perception of the respondents regarding the extent of problems on the implementation of CRM along establishment of protected areas, the highest combined mean was on indicator "Inadequate technical capabilities on the formulation of local ordinances" with 2.07. It was followed by "Problems on delineation of boundaries" with 2.05, then by "Poor enforcement of laws, rules, and regulations on the preservation of established protected areas" with 1.88, and "Lack of cooperation among stakeholders on the maintenance of established protected areas". All indicators listed in this area obtained a score with equivalent description to" slightly a problem".

Alternative livelihood. For the municipal fishers, regarded as "much a problem" were: "Inadequate financial resources to sustain the project" (WM =

3.80), then by "Conflict on land use and territorial rights" (WM 3.21). All other indicators were described as "slightly a problem" and "Not a problem at all".

Among commercial fishers, regarded as "much a problem" was the indicator "Inadequate financial resources to sustain the project". This obtained the highest weighted mean of 3.63. However, "Inefficient monitoring of the project by managers and implementers" was described as "moderately a problem" with a weighted mean of 2.55. All other indicators were rated "slightly a problem".

For barangay officials the following indicators were considered "much a problem" by the respondents. These were on "Inadequate financial resources to sustain the project" (WM = 3.79), and "Inadequate technical knowledge and skills on the management of projects" (WM = 3.61). Other indicators on this area were described as "slightly a problem".

As to technologists/department managers the respondents claimed that "Inefficient monitoring of the project by managers and implementers" and "Inadequate financial resources to sustain the project" which posted the highest weighted mean of 4.35 and 4.00 was described as "very much a problem". Majority of the listed indicators were described as "slightly a problem".

From the table above the highest combined mean was obtained by the indicator "inadequate financial resources to sustain the project with 3.80 and is

Table 58

Extent of Problems Encountered on Coastal Resource Management (CRM) Implementation Relative to Alternative Livelihood as Perceived by the four Groups of Respondents

Problem Areas	Respondents' Perceptions				Combined Mean Interpretation
	MF W/Mean Interpretation	CF W/Mean Interpretation	BO W/Mean Interpretation	T/DM W/Mean Interpretation	
VI. ALTERNATIVE LIVELIHOOD					
1. Inadequate financial resources to sustain the project	3.80 MAP	3.63 MAP	3.79 MAP	4.00 MAP	3.80 MAP
2. Low price of the product	1.45 NAP	2.25 SAP	1.69 SAP	2.14 SAP	1.88 SAP
3. Lack of market for the Product	1.72 SAP	2.30 SAP	1.85 SAP	1.21 NAP	1.77 SAP
4. Conflict on Land use and territorial rights	3.21 MoAP	2.25 SAP	1.94 SAP	1.65 SAP	2.28 SAP
5. Inadequate technical knowledge and skills on the management of the projects	1.72 SAP	2.15 SAP	3.61 MAP	1.72 SAP	2.30 SAP
6. Problem on peace and Order	1.45 NAP	1.91 SAP	1.86 SAP	2.07 SAP	1.82 SAP
7. Security of the project	1.97 SAP	2.20 SAP	1.68 SAP	1.50 NAP	1.83 SAP
8. Inefficient monitoring of the project by managers and implementers	1.96 SAP	2.55 MoAP	2.39 SAP	4.35 MoAP	2.81 MoAP
9. Low level of commitment on the management of livelihood projects being implemented	2.24 SAP	1.45 NAP	2.08 SAP	1.58 SAP	1.84 SAP
AREA MEAN	2.17 SAP	2.31 SAP	2.32 SAP	2.39 SAP	2.26 SAP

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much a Problem (VMAP)
4	3.51 - 4.50	Much a Problem (MAP)
3	2.51 - 3.50	Moderately a Problem (MoAP)
2	1.51 - 2.50	Slightly a Problem (SAP)
1	1.00 - 1.50	Not a Problem at all (NAP)

WM - Weighted Mean ; I - Interpretation

described as "much a problem". This was followed by the indicator "Inefficient monitoring of the project by the managers and implementers" with 2.81 interpreted as "moderately a problem".

All other indicators listed in this area with a combined mean which ranges from 1.77 to 2.30 were all described as "slightly a problem". This problem area obtained an area mean of 2.26 verbally described as "slightly a problem".

Research. For municipal fishers, "Inadequate number of personnel to carry out scientific investigation was rated as "much a problem" with a weighted mean of 3.87. Other indicators which are "Lack of adequate funding for research activities", "Inadequate knowledge on resource assessment tools and methodologies" and "Poor linkage with research institutions carrying out research activities on CRM" were rated as "slightly a problem" and "not a problem at all".

Among commercial fishers the highest weighted mean of 3.64 and described as "much a problem" was on the indicator "Lack of adequate funding for research activities".

These were followed by "Poor linkage with research institutions carrying out CRM activities" and "Inadequate number of personnel to carry out scientific investigations" with weighted means of 2.84 and 3.04, respectively. The lowest was on inadequate knowledge on assessment tools and methodologies 2.25 and described as "slightly a problem".

Table 59

Extent of Problems Encountered on Coastal Resource Management (CRM) Implementation Relative to Research as Perceived by the four Groups of Respondents

Problem Areas	RESPONDENTS' PERCEPTIONS				Combined Mean Interpret-ation
	MF W/Mean Interpretation	CF W/Mean Interpretation	BO W/Mean Interpretation	T/DM W/Mean Interpretation	
VII. RESEARCH					
1. Inadequate knowledge on resource assessment tools and methodologies	1.00 NAP	2.25 SAP	2.40 SAP	1.93 SAP	1.89 SAP
2. Lack of adequate funding for research activities	2.31 SAP	3.64 MAP	2.24 SAP	4.72 VMAP	3.22 MoAP
3. Inadequate number of personnel to carry out scientific investigations	3.87 MAP	2.62 MoAP	2.62 MoAP	2.14 SAP	2.81 MoAP
4. Poor linkage with research institutions carrying out research activities on CRM	2.32 SAP	2.84 MoAP	3.90 MAP	3.00 MoAP	3.01 MoAP
AREA MEAN	2.35 SAP	2.94 MoAP	2.79 MoAP	2.95 MoAP	2.73 MoAP

Legend:

Scale	Numerical value	Interpretation
5	4.51 - 5.00	Very Much a Problem (VMAP)
4	3.51 - 4.50	Much a Problem (MAP)
3	2.51 - 3.50	Moderately a Problem (MoAP)
2	1.51 - 2.50	Slightly a Problem (SAP)
1	1.00 - 1.50	Not a Problem at all (NAP)

WM - Weighted Mean ; I - Interpretation

On barangay officials, indicators described as "much a problem" with weighted means of 3.90 were on indicator "poor linkage with research institutions carrying out research activities on CRM."

Among technologists/department managers, "Lack of adequate funding for research activities" with a weighted mean of 4.72 was regarded "very much a problem". Those that were considered "moderately a problem" were "Poor linkage with research institutions carrying out research activities on CRM" (WM = 2.14) and "Inadequate number of personnel to carry out scientific investigations" (WM = 4.22). "Inadequate knowledge on resource assessment tools and methodologies" was described as "slightly a problem" with a weighted mean of 1.93.

Furthermore, as shown in Table 59 indicators that got the highest combined mean of 3.01 was on "Lack of adequate funding for research activities", followed by "Poor linkage with research institutions carrying out research activities on CRM with 3.01, then by "Inadequate number of personnel to carry out scientific investigation" with 2.81. These indicators were all described as "moderately a problem".

The remaining indicators which is "Inadequate knowledge on resource assessment tools and methodologies" got the lowest mean of 1.89 described to be "slightly a problem". In general this problem area got an area mean of 2.73 equally described as "moderately a problem".

Comparison of the Perceptions of the Different Groups of Respondents on the Problems Relative to the Implementation of CRM Program

This section presents the comparison of the perceptions of the municipal fisherfolks, commercial fisherfolks, barangay officials, and technologists/ department managers on the problems relative to the implementation of CRM program.

Public education. Table 60 summarizes the data on the perceptions of the four groups of respondents on the problems relative to the implementation of CRM program along public education. The average perceptions among municipal fisherfolks, commercial fisherfolks, barangay officials, and technologists/department managers and their variances are 2.16 and 0.47; 2.53 and 0.33; 2.59 and 0.46; 1.93 and 0.14, respectively.

In order to determine significant differences on the level of perceptions among groups of respondents, Analysis of Variance (ANOVA) was applied. Statistical computations showed that the F-computed value of 21.66 is greater than the critical/tabular F-value of 2.62 at .05 level of significance and df 3 and 645. Therefore, the hypothesis that "There is no significant difference on the perceptions of the four groups of respondents on the problems relative to the implementation of the CRM program along public education" is rejected.

Table 60

Comparison of the Perceptions of the Four Groups of Respondents on the Problems Relative to the Implementation of the CRM Along Public Education

SUMMARY				
Groups	Count	Sum	Average	Variance
Technologists	14	27.00	1.93	0.14
Brgy. Officials	170	440.00	2.59	0.46
Commercial Fishers	102	257.67	2.53	0.33
Municipal Fishers	363	782.33	2.16	0.47

ANOVA							
Source of Variation	SS	Df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	28.57	3	9.52	21.66	2.24E-13	2.62	S/Reject Ho
Within Groups	283.57	645	0.44	-	-	-	-
Total	312.14	648	-	-	-	-	-

Further testing through Scheffe's Test was resorted to in order to determine where the difference lies. As can be gleaned in Table 60, four pairs of respondents proved to have more or less different assessments in terms of numerical ratings. These are: 1) technologists/department managers and barangay officials, 2) technologists/department managers and commercial fisherfolks, 3) barangay officials and municipal fisherfolks, 4) and commercial fisherfolks and municipal fisherfolks.

Table 61

Posteriori Test Using Scheffe's Test on the Problem Felt by the Four Groups of Respondents on the Implementation of the CRM Program Along Public Education

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologist & Brgy. Officials	0.66	12.81	7.86	S
Technologists & Commercial Fishers	0.60	10.07	7.86	S
Technologists & Municipal Fishers	0.23	1.62	7.86	NS
Brgy. Officials & Commercial Fishers	0.06	0.52	7.86	NS
Brgy Officials & Municipal Fishers	0.43	48.65	7.86	S
Commercial & Municipal Fishers	0.37	24.77	7.86	S

Capability building. Presented in Table 62 is the summary of comparison of the perceptions of municipal fisherfolks, commercial fisherfolks, barangay officials on the problems of CRM program implementation along capability building.

The highest average rating of 2.76 was noted among barangay officials with a variance of 0.41, followed by commercial fisherfolks with an average of 2.69 and variance of 0.37. On the other hand, municipal fisherfolks has an average rating of 2.45 with a variance of 0.43. The lowest average is recorded among technologists/department managers obtaining an average rating of 2.43 with a variance of 0.12.

Table 62

Comparison of the Perceptions of the Four Groups of Respondents on the Problems Relative to the Implementation of the CRM Along Capability Building

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	34.00	2.43	0.12
Brgy. Officials	170	469.40	2.76	0.41
Commercial Fishers	102	247.80	2.69	0.37
Municipal Fishers	363	889.00	2.45	0.43

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	13.38	3	4.46	10.96	4.97E-07	2.62	S/Reject Ho
Within Groups	262.28	645	0.41	-	-	-	-
Total	257.65	648	-	-	-	-	-

To determine the significant differences among the average ratings of the four groups of respondents, analysis of variance was resorted to and results of the statistical analysis is presented in the same table (Table 62). The F-computed value is 10.96 and is higher than the critical/tabular value of 2.62 at .05 level of significance and at 3 and 645 degrees of freedom. With the rejection of the null hypothesis, further testing was undertaken.

The results of the Scheffe's test, as reflected in Table 63, showed that significant differences occur between the pairs of barangay officials and municipal fisherfolks and between commercial fisherfolks and municipal

fisherfolks. Other comparisons among respondents showed no significant differences.

Table 63

Posteriori Test Using Scheffe's Test on the Problem Felt by the Four Groups of Respondents on the Implementation of the CRM Program Along Capability Building

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologist & Brgy. Officials	0.33	3.44	7.86	NS
Technologists & Commercial Fishers	0.26	2.03	7.86	NS
Technologists & Municipal Fishers	0.02	0.01	7.86	NS
Brgy. Officials & Commercial Fishers	0.07	0.76	7.86	NS
Brgy Officials & Municipal Fishers	0.31	27.14	7.86	S
Commercial & Municipal Fishers	0.24	11.19	7.86	S

Fishery Legislation and Law Enforcement. Presented in Table 64 is the summary of the compared perceptions of the four groups of respondents on the problems relative to the implementation of CRM program along legislation and law enforcement.

The average ratings are technologists/department managers = 2.36; barangay officials = 2.45; commercial fisherfolks = 2.56; and municipal fisherfolks

= 2.18. Analysis of Variance (ANOVA) was applied to determine significant differences among groups of respondents.

Table 64

Comparison of the Perceptions of the Four Groups of Respondents on the Problems Relative to the Implementation of the CRM Along Fishery Legislation and Law Enforcement

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	33.10	2.36	0.03
Brgy. Officials	170	415.70	2.45	0.24
Commercial Fishers	102	261.30	2.56	0.19
Municipal Fishers	363	790.90	2.18	0.23

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	15.86	3	5.29	23.75	1.37E-14	2.62	S/Reject Ho
Within Groups	143.61	645	0.22	-	-	-	-
Total	159.46	648	-	-	-	-	-

The computed F-value is 23.75 and is greater than the critical/tabular F-value of 2.62 at .05 level of significance with 3 and 645 degrees of freedom. The evaluation shows that the hypothesis that "there is no significant difference on the perceptions of the four groups of respondents on the problems relative to the

implementation of the CRM program along legislation and law enforcement" is rejected.

Further testing using Scheffe's Test, as reflected in Table 65 shows that no significant difference occurred in comparisons between technologists/department managers and barangay officials, between technologists/department managers and commercial fisherfolks, and between technologists/department managers and municipal fisherfolks, and between barangay officials and commercial fisherfolks.

Table 65

Posteriori Test Using Scheffe's Test on the Problem Felt by the Four Groups of Respondents on the Implementation of the CRM Program Along Fishery Legislation and Enforcement

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologists & Brgy. Officials	0.09	0.48	7.86	NS
Technologists & Commercial Fishers	0.20	2.24	7.86	NS
Technologists & Municipal Fishers	0.18	1.99	7.86	NS
Brgy. Officials & Commercial Fishers	0.11	3.51	7.86	NS
Brgy Officials & Municipal Fishers	0.27	38.96	7.86	S
Commercial & Municipal Fishers	0.38	52.26	7.86	S

However, comparison between barangay officials and municipal fishers, and between commercial and municipal fishers show significant differences.

Resource regeneration and enhancement. Table 66 presents summary of average perception of the different groups of respondents along resource and regeneration and enhancement.

Table 66

Comparison of the Perceptions of the Four Groups of Respondents on the Problems Relative to the Implementation of the CRM Along Resource Regeneration an Enhancement

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	36.50	2.61	0.06
Brgy. Officials	170	440.50	2.59	0.29
Commercial Fishers	102	273.50	2.68	0.39
Municipal Fishers	363	817.00	2.25	0.42

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	22.83	3	7.61	20.31	1.37E-12	2.62	S/Reject Ho
Within Groups	241.63	645	0.37	-	-	-	-
Total	264.46	648	-	-	-	-	-

The average perceptions of technologists and variance are 2.61 and 0.06; barangay officials with an average of 2.59 and variance of =0.29, commercial

fisherfolks with an average of 2.68 and variance of 0.39; and municipal fisherfolks having an average of 2.25 with variance of =0.42.

There was significant differences that existed on the average perception among the four groups of respondents. In order to determine where the significant differences lie, analysis of variance was administered. Results of the statistical analysis showed that the computed F-value was 20.31. Since this is higher than the tabular F-value of 2.62 at 0.05 level of significance, the null hypothesis is rejected.

Table 67

Posteriori Test Using Scheffe's Test on the Problem Felt by the Four Groups of Respondents on the Implementation of the CRM Program Along Resource Regeneration and Enhancement

Pairs	Absolute Difference in Mean	Computed F value	Critical F value	Evaluation
Technologists & Brgy. Officials	0.02	0.01	7.86	NS
Technologists & Commercial Fishers	0.07	0.16	7.86	NS
Technologists & Municipal Fishers	0.36	4.72	7.86	NS
Brgy. Officials & Commercial Fishers	0.09	1.40	7.86	NS
Brgy Officials & Municipal Fishers	0.34	36.17	7.86	S
Commercial & Municipal Fishers	0.43	39.79	7.86	S

Posteriori testing using Scheffe's test showed no significant differences existed between the perception of the technologists/department managers and

barangay officials; between technologists department managers and commercial fisherfolks; between technologists department managers and municipal fisherfolks, and between barangay official and commercial fisherfolks.

Comparison between barangay officials and municipal fisherfolks and between commercial fisherfolks and municipal fisherfolks showed significant differences.

Establishment of protected areas. The summary of comparison on the four group of respondents on the problems relative to the implementation of CRM along establishment of protected areas are shown in Table 68.

Table 68

Comparison of the Perceptions of the Four Groups of Respondents on the Problems Relative to the Implementation of the CRM Along Establishment of Protected Areas

SUMMARY

Groups	Count	Sum	Average	Variance
Technologists	14	21.50	1.54	0.10
Brgy. Officials	170	362.50	2.13	0.27
Commercial Fishers	102	222.00	2.18	0.30
Municipal Fishers	363	706.75	1.95	0.28

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	9.86	3	3.29	11.95	1.27E-07	2.62	S/Reject Ho
Within Groups	177.37	645	0.27	-	-	-	-
Total	187.23	648	-	-	-	-	-

The highest average rating was recorded among commercial fisherfolks with an average value of 2.18 and a variance of 0.30, while the lowest average value of 1.54 was obtained among technologists/department managers.

To find out significant differences among groups of respondents, analysis of variance was applied. The result of the statistical analysis showed that the computed F-value is 11.95 and greater than the tabular F-value of 2.62 at 0.05 level of significance which led to the rejection of the null hypothesis.

Table 69

Posteriori Test Using Scheffe's Test on the Problem Felt by the Four Groups of Respondents on the Implementation of the CRM Program Along Establishments of Protected Areas

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologists & Brgy. Officials	0.59	16.68	7.86	S
Technologists & Commercial Fishers	0.64	18.68	7.86	S
Technologists & Municipal Fishers	0.41	8.39	7.86	S
Brgy. Officials & Commercial Fishers	0.05	0.59	7.86	NS
Brgy Officials & Municipal Fishers	0.18	13.89	7.86	S
Commercial & Municipal Fishers	0.23	15.60	7.86	S

To test further significant differences, Scheffe's test was applied between the perception of the barangay officials and commercial fisherfolks. On the other hand, other paired comparisons revealed significant differences.

Alternative livelihood. Along this area of concern, the average ratings of the four groups of respondents on their perception of the problems relative to the implementation of CRM program along alternative livelihood are presented in table 70.

The highest average perception of 2.39 was noted among technologists / department managers while the lowest average perception of 2.17 was recorded among municipal fisherfolks.

Table 70

Comparison of the Perceptions of the Four Groups of Respondents on the Problems Relative to the Implementation of the CRM Along Alternative Livelihood

SUMMARY

Groups	Count	Sum	Average	Variance
Technologist	14	33.44	2.39	0.02
Brgy. Officials	170	394.00	2.32	0.22
Commercial Fishers	102	236.11	2.31	0.28
Municipal Fishers	363	788.11	2.17	0.30

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	3.62	3	1.21	4.48	0.004	2.62	S/Reject Ho
Within Groups	173.78	645	0.27	-	-	-	-
Total	177.41	648	-	-	-	-	-

Results of analysis of variance pointed out that the computed F-value was 4.48 and is greater than the critical /tabular F-value of 2.62 at 0.05 level of significance. Therefore the null hypothesis that "there is no significant differences on the extent to which the problems are felt by the different groups of respondents on the implementation of CRM program" was rejected.

Posteriori test through Scheffe's test showed that significant difference existed between the perceptions of the barangay officials and municipal fisherfolks. However, other comparisons were evaluated as not significant.

Table 71

Posteriori Test Using Scheffe's Test on the Problem Felt by the Four Groups of Respondents on the Implementation of the CRM Program Along Alternative Livelihood

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologists & Brgy. Officials	0.07	0.23	7.86	NS
Technologists & Commercial Fishers	0.08	0.29	7.86	NS
Technologists & Municipal Fishers	0.22	2.42	7.86	NS
Brgy. Officials & Commercial Fishers	0.01	0.02	7.86	NS
Brgy Officials & Municipal Fishers	0.15	9.65	7.86	S
Commercial & Municipal Fishers	0.14	5.78	7.86	NS

Research. The compared perception of the four groups of respondents on the extent of problems felt in the implementation of CRM program along research are presented in Table 72.

Table 72

Comparison of the Perceptions of the Four Groups of Respondents on the Problems Relative to the Implementation of the CRM Along Research

SUMMARY				
Groups	Count	Sum	Average	Variance
Technologists	14	41.25	2.95	0.15
Brgy. Officials	170	474.25	2.79	0.35
Commercial Fishers	102	289.83	2.84	0.48
Municipal Fishers	363	853.75	2.35	0.47

ANOVA							
Source of Variation	SS	df	MS	F	P-value	F crit	Evaluation/ Decision
Between Groups	34.85	3	11.62	26.81	2.38E-16	2.62	S/Reject Ho
Within Groups	279.48	645	0.43	-	-	-	-
Total	314.33	648	-	-	-	-	-

The average ratings of variance among respondents are technologists /department managers, 2.95 and 0.15; barangay officials, 2.79 and 0.35; commercial fisherfolks, 2.84 and 0.48, and municipal fisherfolks, 2.35 and 0.47. Result of the analysis of variance (ANOVA) showed that the computed F-value is

26.81 as compared to the critical /tabulated F-value of 2.62 at 0.05 level of significance with 3 and 645 degree of freedom.

Since the computed F-value is greater than the tabular F-value the hypothesis that "there are no significant differences on the perception of the four groups of respondents on the problems related to the implementation of CRM program along research' is rejected. Hence, the result is significant.

With the rejection of the hypothesis posteriori test through Scheffe's test was administered. Results showed that no significant differences existed between technologists/ department managers and barangay officials; between technologists/ department managers and commercial fisherfolks; and between barangay officials and commercial fisherfolks.

Table 73

Posteriori Test Using Scheffe's Test on the Problem Felt by the Four Groups of Respondents on the Implementation of the CRM Program Along Research

Pairs	Absolute Difference in Mean	Computed F' value	Critical F' value	Evaluation
Technologists & Brgy. Officials	0.16	0.77	7.86	NS
Technologists & Commercial Fishers	0.11	0.35	7.86	NS
Technologists & Municipal Fishers	0.60	11.29	7.86	S
Brgy. Officials & Commercial Fishers	0.05	0.37	7.86	NS
Brgy Officials & Municipal Fishers	0.44	52.13	7.86	S
Commercial & Municipal Fishers	0.49	44.46	7.86	S

Significant differences existed between technologist /department managers and municipal fisherfolks; between barangay officials and municipal fisherfolks and between commercial fisherfolks and municipal fisherfolks.

Chapter 5

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains the significant findings of the study, the subsequent conclusions that were drawn, as well as the recommendations formulated with the intention of making the implementation of CRM program in Calbayog City more effective.

Summary of Findings

The following were the major findings of the study, to wit:

1. As regards to ages of the respondents, the average age for municipal fisherfolks was 42; 53, 37.54 for commercial fisherfolks; 45.50 for barangay officials, and 50.21 for technologists and department managers. The standard deviation were 13.51 for commercial fisherfolks; 15.47, barangay officials; 12.62, technologists, and department managers, 4.92 years.

2. In terms of sex distribution, majority of the respondents is male which comprised 77.97 percent. The male majority is about 78.51 percent in municipal fisherfolks and 100.00 percent in commercial fisherfolks, 65.29 percent among barangay officials and 57.14 percent in technologists and department managers.

3. Relative to civil status, 87.60 percent of the municipal fishers were married, 9.37 percent were single and 3.03 percent were widow/ widower. For

commercial fisherfolks, 79.41 percent were married and 20.59 percent were single. In barangay officials 93.53 percent are married, 3.53 percent are widow and 2.94 percent are single. In the case of technologists and department managers, 85.72 are married and 7.14 percent are widow and 7.134 percent are single.

4. As to educational background the data showed that majority of the respondents in municipal fisherfolks is in the elementary level with 34.71 percent and 25 percent elementary graduate, 13.29 percent high school graduate ,and 4.41 percent baccalaureate degree. Meanwhile, among commercial fisherfolks, 46.10 percent are elementary level and 19.60 percent elementary graduate. The remaining percentage constituted the baccalaureate degree, college and secondary level. About 22.94 percent of the barangay officials are elementary graduate, 15.29 percent high school graduate and 11.18 percent are degree holder. Among technologist and department managers, 64.30 percent comprise those baccalaureate degree holders, 14.30 percent with master's units and 21.40 percent full pledge masters holder.

5. For the average monthly income, the municipal fisherfolks had an average monthly income of PhP3,757.40 while the commercial fisherfolks amounted to PhP9,803.92. Among barangay officials, the average monthly income recorded at PhP11,720.00. Among technologists and department managers, PhP19,857.14 was the average monthly income.

6. The average length of experience of the municipal fisherfolks was 12.82 years, for commercial fisherfolks, 14.18, and 16.21 for barangay officials. On the other hand, among technologists and department managers, the average length of experience was 17.29 years. Furthermore, the standard deviations were municipal fisherfolks, 5.32; commercial fisherfolks, 6.97; barangay official, 6.87, and technologists and department managers, 5.22 years.

7. Pertaining to the number of trainings attended related to CRM for the last two years, majority of the respondents had not attended trainings at the national level. Moreover, at the regional level, 17.41 percent have availed of trainings, and 81.20 percent at the local level. All technologist and department mangers have availed of the national, regional and local level trainings which ranged from one to five times for the last two year.

8. As to CRM project being implemented, two fish sanctuaries were established located in barangays San Joaquin and Tinambacan. There were 106 artificial reef modules that were deployed/launched in 11 barangays. Mariculture projects like seaweed culture were established in three barangays and one mariculture park for fish cages was established in barangay Malajog. Mangrove reforestation projects were also established in Tomaligues, San Policarpio and Tinambacan.

9. As to livelihood project being implemented, five coastal barangays have availed of. These are barangays Binaliw for fishing gears (multiple set longlines) with 21 beneficiaries, Bugtong (seaweeds culture) with 15

beneficiaries, Carayman (fish/squid pot fishing gear) with 12 beneficiaries, Malajog (milkfish cage culture) with 45 beneficiaries, and Matobato (vacuum packed machine for smoke fish) with 10 beneficiaries.

10. As to municipal profile of the fisherfolks, there were 70 who are engaged in baby ring net fishing, 46 in shrimp gathering without gear,15 seaweed gatherer, 98 mollusk and crustaceans gleaners, 43 spear fishers, eight sea cucumber gatherer, 114 pot fishers, 190 multiple set longliners, 272 hook and line fishers, 81 push net fishers,41 fish coral operators, 158 gill netters, 174 squid jiggers, and 193 drift gill net operators.

11. As to commercial fisheries profile, 13 fishing boats were recorded with two units of Danish seine with 17 average number of crews, and 11 trawls with an average crew of 10.

12. As to compared perception of the four groups of respondents on the extent of CRM program implementation along public education, the highest average of 2.90 was noted among barangay officials, followed by municipal fisherfolks with 2.86, then by technologists and department managers with 2.73 and the lowest average pegged at 2.59 was on commercial fisherfolks.

Result of the analysis of variance showed a tabulated F-value of 6.65 and is higher than the critical F-value of 2.62 at 3, and 645 degree of freedom. Since it is significant, the null hypothesis that "there are no significant differences on perceptions of the different groups of respondents on the extent of CRM program implementation" was rejected.

The result of the posteriori test using the Scheffe's test showed significant differences between barangay officials and commercial fisherfolks, and between commercial fisherfolks and municipal fisherfolks. Other pairs showed no significant differences.

13. As to compared perceptions of the four groups of respondents on the extent of CRM program implementation along capability building, the highest average of 4.33 was obtained among department managers while the lowest was noted among municipal fisherfolks with 3.58.

The analysis of variance showed that the tabulated F-value of 5.91 is higher than the critical F-value of 2.62. The significant evaluation led to the rejection of the null hypothesis.

The result of the posteriori test using the Scheffe's test also showed no significant differences between the barangay officials and commercial fisherfolks, between barangay officials and municipal fisherfolks, and between Commercial Fisherfolks and Municipal Fisherfolks. Other pairs showed significant difference.

14. On the compared perception of the four groups of respondents on the extent of CRM program implementation along legislation and law enforcement, the data show that the technologists/department managers obtained the highest average of 4.50 while municipal fisherfolks got the lowest average of 3.67.

The analysis of variance showed a significant result of 8.82 F-tabular value. Therefore, the null hypothesis that "there are no significant differences on perceptions of the different groups of respondents on the extent of CRM program implementation" was rejected.

Result of the posteriori test using the Scheffe's test showed no significant differences between the barangay officials and commercial fisherfolks, and between barangay officials and municipal fisherfolks, and between commercial fisherfolks and municipal fisherfolks. Other pairs showed significant difference.

15. As to compared perception of the four groups of respondents on the extent of CRM program implementation along resource regeneration and enhancement, the data showed that the technologists/department managers obtained the highest average of 3.67 while commercial fisherfolks got the lowest average value of 2.92.

The analysis of variance (ANOVA) obtained a computed value of 7.24 which is higher than the tabular F-value 2.62. Therefore the null hypothesis that "there are no significant differences on perceptions of the different groups of respondents on the extent of CRM program implementation" was rejected.

The result of the posteriori test using the Scheffe's test showed no significant differences between the barangay officials and commercial fisherfolks, barangay officials and municipal fisherfolks, and between commercial fisherfolks and municipal fisherfolks. Other pairs showed significant difference.

16. On the comparison of the perception of the four groups of respondents on the implementation of CRM relative to the establishment of protected areas, the summary table shows that the technologists and department managers obtained an average of 4.03 with a variance of 0.02 followed by barangay officials with 3.38 average and a variance of 0.40, then by municipal fisherfolks with 3.35, and 3.21 for commercial fisherfolks.

The analysis of variance (ANOVA) obtained a computed value of 11.93 which is higher than the tabular F-value 2.62. Therefore the null hypothesis that "there are no significant differences on perceptions of the different groups of respondents on the extent of CRM program implementation" was rejected.

The result of the posteriori test using the Scheffe's test showed no significant differences between the barangay officials and commercial fisherfolks, barangay officials and municipal fisherfolks, and between commercial fisherfolks and municipal fisherfolks. Other pairs showed significant difference.

17. As to compared perception of the four groups of respondents on the extent of CRM program implementation along alternative livelihood, the result revealed that the highest average was pegged among technologists/department managers with a value of 4.18, followed by municipal fisherfolks with 3.25. The lowest average was noted among barangay officials with a value of 3.06.

From the compared perceptions, the analysis of variance obtained an F-value of 15.50, which is higher than the critical F-value of 2.62 and 3, 645 degree

of freedom at .05 level of significance. Since, the result is significant the null hypothesis that "there are no significant differences on the perception of the different groups of respondents on the extent of CRM implementation" was rejected.

The result of the posteriori test using the Scheffe's test showed significant differences between barangay official and commercial fisherfolks, and between commercial fisherfolks and municipal fisherfolks. Other pairs showed no significant differences.

18. As to compared perception of the four groups of respondents on the extent of CRM program implementation relative to research, the data show that the average value of 4.20 was obtained by technologist and department managers, 3.41 among municipal fisherfolks, 3.29 among barangay officials and 3.05 for commercial fisherfolks.

The result of the analysis of variance showed a computed F-value of 29.23 which was very much greater than the critical F-value of 2.62. Since the result was significant, the null hypothesis that "there are no significant differences on the perception of the different groups of respondents on the extent of CRM implementation" was rejected.

The result of the posteriori test using the Scheffe's test shows no significant difference between barangay officials and municipal fisherfolks and all other pairs differed significantly.

23. As to compared perceptions of the four groups of respondents on problems relative to the implementation of CRM program along public education, the average perception of the municipal fisherfolks, commercial fisherfolks, barangay officials and technologists/department managers were as follows 2.16, 2.53, 2.59, and 1.93 respectively.

The statistical computation showed that the F-value of 21.66 is greater than the tabulated F-value at 2.62. Therefore, the null hypothesis that" there are no significant differences on the perception of the four groups of respondents on the problems relative to the implementation of CRM program" is rejected. The Posteriori test using Scheffe's test shows no significant differences exist between technologists/department managers and municipal fishers, and between barangay officials and commercial fisherfolks.

24. As to compared perceptions of the four groups of respondents on the problems of CRM program implementation along capability building, the highest average rating of 2.76 was noted among barangay officials, followed by commercial fisherfolks. The lowest average was recorded for technologists/ department managers obtaining an average rating of 2.43.

The result of the analysis of variance showed a computed F-value of 10.96 and is higher than the critical/tabular F-value of 2.62 at 0.05 level of significance and at 3, 645 degrees of freedom. Therefore, the hypothesis that " there are no significant differences on the perception of the four groups of respondents on the

problems relative to the implementation of CRM program along capability building " is rejected.

25. As to compared perception of the four groups of respondents on the problems of CRM program implementation along legislation and law enforcement, the following data were obtained: as to average ratings, technologists and department managers, 2.36; barangay officials, 2.45; commercial fisherfolks, 2. 56, and municipal fisherfolks, 2.18.

The computed F-value on the analysis of variance is 23.75 and is greater than the critical F-value f 2.62 at 0.05 level of significance with 3, and 645 degrees of freedom. The evaluation that shows that there are no significant differences on the perception of the four groups of respondents on the problems relative to the implementation of CRM program along legislation and law enforcement is therefore rejected.

26. As to compared perception of the four groups of respondents on the problems of CRM program implementation along resource regeneration and enhancement, the average of 2.61 was obtained for technologists/department managers, 2.59 for barangay officials, 2.68 for commercial fisherfolks and 2.25 for municipal fisherfolks.

The result of the statistical analysis showed that the computed F-value was 20.31 and is higher than the tabular F-value of 2.62. Therefore the null hypothesis was rejected. The Scheffe's test showed no significant difference existed between the perception of the technologists and department managers

and barangay officials, technologists and commercial fisherfolks, technologists and municipal fishers, and between barangay officials and commercial fisherfolks.

27. As to establishment of protected areas, result of the ANOVA showed the computed F-value of 11.95 higher than the critical F-value of 2.62. Therefore, the null hypothesis was rejected. The posteriori test showed no significant difference between barangay officials and commercial fisherfolks. Other pairs showed significant differences.

28. As to research, the result of the analysis of variance showed an F-value of 26.81 which is very much higher than the tabular/critical F-value of 2.62. Hence, the null hypothesis was rejected. On the Posteriori test using the Scheffe's test, the result showed a significant difference existed between barangay officials and commercial fisherfolks, between barangay officials and municipal fisherfolks, and between commercial fisherfolks and municipal fisherfolks.

29. On the relationship between the extent of implementation of CRM along with the different areas of concerns and the profile of the technologists and department managers, the result of the correlation coefficient and the computed Fisher's t-value of 2.06 evaluated at 0.05 level of significance was evaluated as significant. Therefore, the null hypothesis that "there are no significant relation ship between the extent of implementation of CRM program and the profile of the technologists and department managers" was rejected.

30. As to the relationship between the extent of implementation of CRM along with the different areas of concern and the profile of municipal fisherfolks, the result of the correlation coefficient and Fisher's t-value of 1.96 evaluated at 0.05 level of significance shows significant relationship. Therefore the null hypothesis that 'there are no significant relation ship between the extent of implementation of CRM program and the profile of the municipal fisherfolks" was rejected.

31. As to the relationship between the extent of implementation of CRM along with the different areas of concern and the profile of commercial fisherfolks, the result of the correlation coefficient and Fisher's t-value of 1.96 evaluated at 0.05 level of significance showed a significant relationship. Therefore, the null hypothesis that 'there are no significant relationship between the extent of implementation of CRM program and the profile of the commercial fisherfolks" was rejected.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

1. The implementation of CRM program in Calbayog City is male dominated as evidenced by the 100.00 percent in commercial fisherfolks, 78.51 percent among municipal fisherfolks, 65.29 percent among barangay officials, and 57.14 percent among technologists and department managers.

2. As to ages, the municipal fisherfolks and barangay officials belong to the middle age group with average of 42.53 and 45.50 years old while the technologists/department managers were older with an average age of 50.21 years old. The commercial fisherfolks are younger with an average age of 37.54 years. As to civil status, married individuals dominated the respondents.

3. Municipal fisherfolks had longer years of experience in CRM compared to their counterpart in commercial fisherfolks.

4. The average monthly income of municipal fisherfolks is lower than that of commercial fisherfolks. This could be attributed to the type of fishing gear they are using and the fishing ground where fishing operation is made.

5. The municipal fisherfolks adopt the passive and sustainable types of fishing gears while the commercial fisherfolks are more inclined to trawls and Danish seine.

6. Production level in mariculture (seaweed and fish cage) is low compared to the regional average which could be attributed to the limited areas being utilized and the number of fisherfolks adopting the technology. Lower fish catch could also be attributed to extreme fishing pressure.

7. In terms of CRM implementation, program implementers are more active in the area of fishery legislation and law enforcement, and capability building which is evident in the evaluation described as "much implemented". Other areas of concern like establishment of protected areas, alternative

livelihood, research, resource regeneration and enhancement, and public education were "moderately implemented".

8. As to status of CRM project being implemented it can be concluded that the city government was able to accomplish as much projects as needed by the community to respond to issues and problems in the coastal communities and their resources.

9. The problems identified relative to CRM program implementation were on the area of fishery legislation and law enforcement, research, and capability building justified for lack of adequate funding.

Recommendations

On the basis of the findings and conclusions presented, the following recommendations are given:

1. In order to improve fish production and sustain the major key habitat in the coastal area of Calbayog and Samar Sea as a whole, Coastal Resource Management should be given due attention by the concerned Local Government Units of Western Samar. The Bureau of Fisheries and Aquatic Resources (BFAR) in particular, the academe and private institutions should spearhead in forging possible strategies for better CRM implementation.

2. The LGU should revisit the Coastal Resource Management Plan Program in order to come up with strategic and long-term plans and implement policies and development programs consistent with sound coastal management.

3. It is also suggested that the city government allocate funding for CRM implementation. Short term trainings are necessary to heighten the level of theoretical, conceptual and technological awareness of the LGU staff and stakeholders particularly on fishery legislation and law enforcement, research, and capability building.

4. Promotion of aquaculture technologies/ activities and projects in freshwater areas, brackishwater areas and inland bodies of water to maximize untapped resources of inland fisheries. Projects like culture of fresh water species, i.e., catfish, silver seabass, giant freshwater prawn, pangasius, and tilapia are encouraged. On mariculture technology, culture of mud crab, milkfish, saline tilapia, sea cucumber, abalone, pearl, giant clam, and seaweeds is advised. Aquasilvi technology must be adopted in mangrove areas.

5. Credit line and loan opportunities at low interest rate with simple terms and condition be accorded and adequately provided to fisherfolks to address their requirement for capital through proper representation of concerned authorities and agencies to financial institutions and business organizations.

6. Promote eco-tourism in the city of Calbayog and start to integrate the concept of coastal resource management to every establishment, hotel, resort, tourist and traveler. Establish dive sites in the fish sanctuary areas for scuba diving.

7. Similar investigation may be undertaken in other municipalities and cities in the province, especially those with CRM programs.

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APPENDICES

APPENDIX A

REQUEST FOR APPROVAL OF RESEARCH PROBLEM

Republic of the Philippines
SAMAR STATE UNIVERSITY MERCEDES CAMPUS
Catbalogan, Samar

June 9, 2009

The Acting Dean
Samar State University Mercedes Campus
Catbalogan, Samar

Sir:

I have the honor to submit for approval one of the research problems for my masteral thesis, preferably Number 1.

1. IMPLEMENTATION OF COASTAL RESOURCE MANAGEMENT (CRM) PROGRAM IN CALBAYOG CITY, WESTERN SAMAR: A FEEDBACK ANALYSIS

2. REDUCTION OF BY-CATCH IN TRAWL FISHERY USING JUVENILE AND TRASH FISH EXCLUDER DEVICE (JTED) IN SAMR SEA

3. PROFILE AND TRAINING NEEDS OF FISHERFOLKS IN CALBAYOG CITY, WESTERN SAMAR

Your favorable action on the matter is highly appreciated.

Very truly yours,

(SGD.) MARCOS ABRUGAR SABIDO
Researcher

APPROVED:

(SGD.) LATIP S. ABDURAHMAN, Ph.D.
Acting Dean

APPENDIX B

Republic of the Philippines
SAMAR STATE UNIVERSITY MERCEDES CAMPUS
Catbalogan, Samar

July 5, 2009

APPLICATION FOR ASSIGNMENT OF ADVISER

Name: **SABIDO** **MARCOS** **ABRUGAR**
(Surname) (First name) (Middle name)

CANDIDATE FOR DEGREE : **Master in Fisheries Technology**

AREA OF SPECIALIZATION : **Aquaculture**

TITLE OF PROPOSED MASTERAL THESIS: **"Implementation of Coastal Resource Management (CRM) Program in Calbayog City Western Samar: A Feedback Analysis"**

(SGD.) MARCOS ABRUGAR SABIDO
Researcher

CONFORME:

(SGD.) LOLITO O. AMPARADO, Ph.D.
Designated Adviser

APPROVED:

(SGD.) LATIP S. ABDURAHMAN, Ph. D.
Acting Dean

APPENDIX C

COVER LETTER AND QUESTIONNAIRE-CHECKLIST

Republic of the Philippines
SAMAR STATE UNIVERSITY MERCEDES CAMPUS
Catbalogan, Samar

_____
Date

Dear Respondent:

You have been selected as respondent in the research entitled **"IMPLEMENTATION OF COASTAL RESOURCE MANAGEMENT (CRM) PROGRAM IN CALBAYOG CITY, WESTERN SAMAR: A FEEDBACK ANALYSIS."** The main objective of the study is to assess the project as well as the extent of implementation of the coastal resource management (CRM) program of Calbayog City, Western Samar in order to obtain data and relevant information for program efficiency and effectiveness.

May I therefore solicit your assistance to supply the data for this study by answering, as honestly and clearly as possible every item in this questionnaire.

Rest assured that your answers to this questionnaire will be treated with utmost confidentiality and will be used solely for this study and will not jeopardize you in anyway.

Thank you for your valued cooperation.

Very truly yours,

(SGD.) MARCOS ABRUGAR SABIDO
Researcher

"IMPLEMENTATION OF COASTAL RESOURCE MANAGEMENT (CRM) PROGRAM IN CALBAYOG CITY, WESTERN SAMAR: A FEEDBACK ANALYSIS"

QUESTIONNAIRE-CHECKLIST

PART I- PERSONAL INFORMATION

Direction: Read the statement and please write or check the corresponding response on the space provided.

1. Name of Respondent: _____

2. Address: _____

3. Sex: _____ Male _____ Female

4. Age _____ years

5. Civil Status:
   - _____ 5.1 Single
   - _____ 5.2 Married
   - _____ 5.3 Widow/ Widower
   - _____ 5.4 Separated
   - _____ 5.5 Other please specify _____

6. Highest Educational Attainment
   - _____ 6.1 Elementary level
   - _____ 6.2 Elementary Graduate
   - _____ 6.3 High School Level
   - _____ 6.4 High School Graduate
   - _____ 6.5 College Level
   - _____ 6.6 Post Secondary Course Completed
     - Please specify _____
     - 6.6.1 specialization _____
   - _____ 6.7 Bachelor's Degree Completed
     - Please specify _____
     - 6.7.1 specialization _____
   - _____ 6.8 With Masteral Units.
   - _____ 6.9 Masteral Degree Completed
     - Please specify _____
     - 6.9.1 specialization _____

7. Length of years you have been involved in the CRM
   - Please specify____ years

8. Trainings attended related to CRM for the last two years:

Title of training:

National level:

_____
_____
_____
_____

(Please use additional sheet, if necessary)

Regional level:

_____
_____
_____
_____

(Please use additional sheet, if necessary)

Local level

_____
_____
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_____
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(Please use additional sheet, if necessary)

9. Average monthly income (in pesos) _____

PART II. EXTENT OF IMPLEMENTATION OF THE COASTAL RESOURCE MANAGEMENT PROGRAM IN CALBAYOG CITY, WESTERN SAMAR

Direction: Please check the corresponding score according to your perception on the space beside the described areas of concerns on the Coastal Resource Management Program of Calbayog City using the five points rating scale.

5- Very much implemented (VMI)
4- Much implemented (MI)
3- Moderately implemented (MoI)
2- Slightly implemented (SI)
1- Not Implemented at all (NI)

AREAS OF CONCERN	Perception				
	5 (VMI)	4 (MI)	3 (MoI)	2 (SI)	1 (NI)
I. PUBLIC EDUCATION					
1. Availability of adequate educational tools and materials on CRM					
1.1 Posters					
1.2 Leaflets					
1.3 Magazine and journals					
1.4 Radio programs					
1.5 Local TV program					
1.6 CD's and Cassette tapes					
1.7 Film strips					
1.8 Commercial papers					
1.9 T-shirts					
1.10 Badges and stickers					
1.11 Local drama and story telling					
1.12 taking key community leaders to see similar problems and developments elsewhere					
1.13 others (please specify)					
2. Conduct symposia and for a on CRM					
II. CAPABILITY BUILDING					
1. Training conducted on:					
1.1 Policies and regulation on CRM					
1.2 Law Enforcement					
1.3 Appropriate technology for rural Communities					
1.4 Technology transfer					

AREAS OF CONCERN	Perception				
	5 (VMI)	4 (MI)	3 (MoI)	2 (SI)	1 (NI)
1.5 Resource Enhancement, Regeneration and Conservation					
1.6 Project development and management					
1.7 Planning, monitoring and evaluation					
1.8 Others (please specify)					
1.9 Provision of trainings to managers and implementers of CRMP					
III. LEGISLATION AND LAW ENFORCEMENT 1. Enactment of city ordinances related to CRM					
2. Apprehension of violators on fishery laws rules and Regulations					
3. Imposition of sanctions					
4. Imposition of fines and penalties					
5. Filing of cases among violators in appropriate bodies and courts of law					
6. Provision of adequate and competent numbers of law enforcers					
7. Provision of monetary incentives for law enforcers					
8. Provision of adequate budgetary support for the maintenance and operation services on law enforcement					
9. Availability of legal support/ services					
IV. RESOURCE REGENERATION AND ENHANCE MENT 1. Mangrove reforestation					
2. Aqua ranching					
3. Stocking and re-stocking of communal waters					
4. Installation of Artificial reefs (AR)					
5. Coral transplantation					
6. Seagrass transplantation					
7. Re-seeding of depleted areas					
V. ESTABLISHMENT OF PROTECTED AREAS 1. Establishment of Marine/ Fish sanctuary					
1.1 Public consultation					
1.2 Conduct of underwater survey/ assessment					
1.3 Legislation					
1.4 Delineation of area and boundary					

AREAS OF CONCERN	Perception				
	5 (VMI)	4 (MI)	3 (MoI)	2 (SI)	1 (NI)
1.5 Provision of markers and bouys					
1.6 Creation of management body					
1.7 Regular monitoring and surveillance of fish Sanctuary					
1.8 Information dissemination on the existence of the fish sanctuary					
1.9 Project impact monitoring					
2. Coral reef rehabilitation and enhancement 2.1 Site survey					
2.2 Public consultation					
2.3 Creation of management body					
2.4 Training of stakeholders					
2.5 Installation of artificial reefs					
2.6 Transplantation of coral reef species					
2.7 Monitoring and surveillance					
VI. ALTERNATIVE LIVELIHOOD 1. Conduct of resource profiling					
2. Identification of potential sites and appropriate technology of livelihood options					
3. Conduct of training on appropriate technology					
4. Established linkage with financial institutions and agencies for financial support					
5. Implement livelihood projects that are environmentally friendly and sustainable					
6. Conduct regular follow-ups on livelihood projects implemented by technologist involved					
7. Conduct regular monitoring of project implemented by CRM managers					
8. Provide regular feedbacks to project beneficiaries on monitoring and evaluation conducted					
9. Increase areas and numbers of beneficiaries to projects that are profitable and sustainable.					

AREAS OF CONCERN	Perception				
	5 (VMI)	4 (MI)	3 (MoI)	2 (SI)	1 (NI)
VII. RESEARCH					
1. Assessment and inventory of aquatic resources					
1.1 Fishes					
1.2 Corals					
1.3 Seaweeds and seagrass					
1.4 mangroves					
2. Assessment of existing habitat					
2.1 Mangroves					
2.2 Coral reefs					
2.3 Seaweeds and sea grass beds					
2.4 Soft bottom habitat					
2.5 Estuarine areas					
3. Investigation and scientific inquiry on issues and problems affecting coastal resource and its environment					
3.1 Resource depletion in coastal areas					
3.2 Wide spread environmental damaged					
3.3 Destructive effect of upland activities on coastal Ecosystem					
3.4 Poverty among municipal fishermen					
3.5 Low productivity in aquaculture					
3.6 Under utilized offshore and economic zone					
3.7 Inefficient utilization of fishery products					

PART III. PROBLEMS ENCOUNTERED IN THE IMPLEMENTATION OF COASTAL RESOURCE MANAGEMENT PROGRAM IN CALBAYOG CITY, WESTERN SAMAR

Direction: Please check the corresponding score according to your perception on the space beside the described problem area using the 5 points rating scale.

5- Very much a problem (VMAP)
4- Much a problem (MAP)
3- Moderately a problem (MoAP)
2- Slightly a problem (SAP)
1- Not a problem at all (NAP)

AREAS OF CONCERN	Perception				
	5 (VMAP)	4 (MAP)	3 (MoAP)	2 (SAP)	1 (NAP)
1. PUBLIC EDUCATION					
1. Inadequate educational materials on CRM					
2. Lack of educational awareness among stakeholder on the importance of CRM.					
3. Lack competent personnel to carry out educational activities on CRM					
4. Others please specify					
II. CAPABILITY BUILDING					
1. Lack of opportunities to attend trainings, seminars, and other capability building activities related to CRM					
2. Inadequate number of personnel locally trained to carry out capability building activities					
3. Inadequate financial resources for capability building activities					
4. Low morale of program implementers on CRM					
5. Inadequate technical skills among program implementers on CRM					
6. Others please specify					
III. LEGISLATION AND LAW ENFORCEMENT					
1. Non –enactment of local ordinances on CRM					
2. Poor implementation of ordinances, rules and regulation on CRM and fisheries conservation					
3. Inadequate number of personnel to enforce laws, rule and regulations on CRM and fisheries conservation					
4. Political intervention on enforcement of fisheries laws, rules and regulations					
5. Leniency of personnel in-charge in the enforcement of the laws					
6. Lack of coordination among agencies/units on law enforcement					

AREAS OF CONCERN	Perception				
	5 (VMAP)	4 (MAP)	3 (MoAP)	2 (SAP)	1 (NAP)
7. Inadequate facilities, supplies and materials for efficient patrolling of designated areas.					
8. Poor cooperation among stakeholders to pursue cases on violators in courts and appropriate bodies					
9. Lack of legal support to personnel involved in pursuing cases in courts among violators					
10. Inadequate knowledge among local personnel in filing appropriate complaints and cases to violators					
11. Others please specify					
IV. RESOURCE REGENERATION AND ENHANCEMENT					
1. Inadequate knowledge and skills in resource regeneration and enhancement					
2. Problem on delineation areas					
3. Inadequate budgetary resources					
4. lack of trained personnel to implement resource regeneration and enhancement projects					
5. others please specify					
V. ESTABLISHMENT OF PROTECTED AREAS					
1. Problem on delineation of boundaries					
2. Inadequate technical capabilities on formulation of local ordinances					
3. Lack of cooperation among stake holders on the maintenance of established protected areas					
4. Poor enforcement of laws, rules and regulations on the preservation of established protected areas					
5. Others, please specify					

AREAS OF CONCERN	Perception				
	5 (VMAP)	4 (MAP)	3 (MoAP)	2 (SAP)	1 (NAP)
VI. ALTERNATIVE LIVELIHOOD					
1. Inadequate financial resources to sustain the project					
2. Low price of the product					
3. lack of market for the product					
4. Conflict on land use and territorial rights					
5. Inadequate technical knowledge and skills on the management of the projects					
6. Problem on peace and order					
7. Security of the project					
8. Inefficient monitoring of the project by managers and implementers					
9. Low level of commitment on management of livelihood projects implemented					
10. others, please specify					
VII. RESEARCH					
1. Inadequate knowledge on resource assessment tools and methodologies					
2. Lack of adequate funding for research activities					
3. inadequate number of personnel to carry out scientific investigation					
4. Poor linkage with research institutions carrying out research activities on CRM					
5. Others, please specify					

What recommendation can you give in order to improve the implementation of the CRM program in Calbayog City?

_____

_____

_____

_____

_____

Thank you very much!

CURRICULUM VITAE

CURRICULUM VITAE

NAME	:	MARCOS A. SABIDO
DATE OF BIRTH	:	April 17, 1973
PLACE OF BIRTH	:	Palamrag, Mercedes E. Samar
PRESENT POSITION	:	Agricultural Technologist I
STATION	:	Local Government Unit, Calbayog City

EDUCATIONAL BACKGROUND

Elementary	:	Banahao Elementary School Banahao, Guiuan E. Samar.
Secondary	:	Samar National School Catbalogan, Samar
College	:	Samar Regional School of Fisheries Mercedes, Catbalogan, Samar
Graduate Studies	:	Master in Fisheries Technology Samar State Polytechnic College Mercedes-Campus now Samar State University Mercedes-Campus Mercedes, Catbalogan, Samar

CIVIL SERVICE ELIGIBILITY

Career Service Professional November 7, 1999

TRAININGS AND SEMINARS ATTENDED

1. Post Evaluation Training of Fish Examiner July 17, 2009, Palo, Tacloban City. Bureau of Fisheries and Aquatic Resource 8

2. Fisheries Research and Development Congress in Eastern Visayas November 12-14, 2008, Samar State University, Catbalogan Samar

3. Retooling of LGU's Fisheries Technicians, July 9, 2008 , Regional Fisheries Training Center, Catbalogan, Samar. Department of Agriculture- Bureau of Fisheries and Aquatic Resources

4. Agricultural Extension Agent Congress May 8, 2008, Tacloban City. Department of Agriculture- Bureau of Fisheries and Aquatic Resources

5. Training course on the Examination of Fish Caught with the use of Explosives March 19-28, 2007 Guiuan E. Samar. Bureau of Fisheries and Aquatic Resource 8

6. Documentation Training on MDG LGU best Practices. Quezon City Manila. Department of Interior and Local Government Central Office.

7. Training on Participatory Planning of Community Based Extension Programs. November 29- December 1, 2005. Calbayog City, Agricultural Training Institute 8.

8. Practical training Demonstration on the Juvenile and Trash Fish Excluder Device in Samar Sea and Maqueda Bay December 9-17, 2003, Catbalogan Samar, Bureau of Fisheries and Aquatic Resource, Central Office

9. In-country training of Paralytic Shellfish Poisoning Monitoring teams In the Philippines September, 12-18, 2004Quezon city Manila, National Fisheries Research and Development Institute.

10. Fishery Law Enforcement Team Training November 12-15, 2002. Calbayog City, Regional Fisheries Training Center.

11. Practical Skills Enhancement on External Resource Accessing November 4-6, 2002 Calbayog City, Japan International Cooperation Agency.

12. Training on the Culture of Grouper in Cages April 22-24, 2002 Calbayog City, Regional Fisheries Training Center, Bureau of Fisheries and Aquatic Resource 8

13. Aquaculture Inventory and profiling, October 8-10, 2002 Tacloban city, Bureau of Fisheries and Aquatic Resource 8

14. Training Workshop on Program Cycle Management. Quezon City Manila, HELVETAS Philippines.

15. Agricultural Marketing Development Workshop June 19-22, 2001 University of the Philippines, Los Baños Laguna, HELVETAS Philippines

16. Managing Tensions and Conflicts on Natural Resource Management, August 1-16, 2000, Bangkok, Thailand. Volunteer Service Overseas.

LIST OF TABLES

Table

Page

Table | Page

Table | Page

Table

Page

Table

Page

Table

Page

Table

Page

Table

Page

LIST OF FIGURES