



Department of Agriculture  
Bureau of Fisheries and Aquatic  
Resources

# Comprehensive National Fisheries Industry Development Plan (CNFIDP)

**Revised Draft: October  
2005**



**The Fisheries Improved for Sustainable  
Harvest Project**

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## ***LIST OF ACRONYMS AND ABBREVIATIONS***

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ADB	- Asian Development Bank
AFMA	- Agriculture and Fisheries Modernization Act
AQD	- Aquaculture Department
AusAID	- Australian Agency for International Development
BAP	- Best Aquaculture Practices
BAS	- Bureau of Agricultural Statistics
BFAR-RO	- Bureau of Fisheries and Aquatic Resources – Regional Office
BOI	- Board of Investments
BOT	- Build, Operate and Transfer Scheme
CABCOM-MOA	- Cabinet Committee on Marine and Ocean Affairs
CAR	- Cordillera Administrative Region
CCRF	- Code of Conduct for Responsible Fisheries
CFVs	- Commercial Fishing Vessels
CITES	- Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNFIDP	- Comprehensive National Fisheries Industry Development Plan
CRM	- Coastal Resources Management
CSO	- Civil Society Organization
CSR	- Corporate Social Responsibility
DA-BAFPS	- Department of Agriculture – Bureau of Agriculture and Fisheries Product Standards
DA-BFAR	- Department of Agriculture-Bureau of Fisheries and Aquatic Resources
DANIDA	- Danish International Development Agency
DBP	- Development Bank of the Philippines
DENR	- Department of Environment and Natural Resources
DFA	- Department of Foreign Affairs
DND	- Department of National Defense
DOF	- Department of Finance
DOST	- Department of Science and Technology
DOST-ITDI	- Department of Science and Technology – Industrial Technology Development Institute
DOST-NFRI	- Department of Science and Technology – National Food Research Institute
DOST-PCIERD	- Department of Science and Technology – Philippine Council for Industry and Energy Research and Development
DOST-TAPI	- Department of Science and Technology – Technology Application and Promotion Institute
DTI	- Department of Trade and Industry
EBFM	- Ecosystem-Based Fisheries Management
EEZ	- Exclusive Economic Zone
EU	- European Union
FAB	- Fisheries and Aquaculture Board
FAD	- Fish aggregating device
FAO	- Food and Agriculture Organization
FARMC	- Fisheries and Aquatic Resource Management Council
FDC	- Foundation for Development Cooperation

FISH Project	- Fisheries Improved for Sustainable Development Project
FPE	- Fish Processing Establishment
FPE	- Foundation for the Philippine Environment
GDP	- Gross Domestic Product
GFI	- Government Financing Institution
GHP	- Good Hygienic Practices
GLP	- Good Laboratory Practices
GMP	- Good Manufacturing Practices
GOP	- Government of the Philippines
GTZ	- German Technical Cooperation
HAB	- Harmful Algal Bloom
HACCP	- Hazard Analysis Critical Control Points
IAPG	- Inter-Agency Planning Group
ICBD	- International Convention on Biological Diversity
ICES	- International Council for the Exploration of the Sea
ICRI	- International Coral Reef Initiatives
IEC	- Information and Education Campaign
IPCS	- Ice Plants and Cold Storage
IUCN	- International Union for the Conservation of Nature and Natural Resources (The World Conservation Union)
JICA	- Japan International Cooperation Agency
KCY	- kilograms per capita per year
LBP	- Land Bank of the Philippines
LGU	- Local Government Unit
LRFFT	- Live Reef Food Fish Trade
M & E	- Monitoring and Evaluation
MARINA	- Maritime Industry Authority
MCS	- Monitoring, Control and Surveillance System
MLP	- Mariculture Livelihood Parks
MOA	- Memorandum of Agreement
MOU	- Memorandum of Understanding
MSY	- Maximum Sustainable Yield
MTADP	- Medium-Term Agricultural Development Plan
MTPDP	- Medium-Term Philippine Development Plan
MTP	- Medium-Term Plans
NAFARRA	- National Fisheries and Aquatic Resources Research Agenda
NCR	- National Capital Region
NEDA	- National Economic Development Authority
NFRDI	- National Fisheries Research and Development Institute
NGAs	- Non-Government Agencies
NGO	- Non-Government Organization
NIPAS	- National Integrated Protected Areas System
NIRDEAP	- National Integrated RDE Agenda and Program
NQS	- National Quality Standards
NSC	- National Safety Council
NSCB	- National Statistical Coordination Board
NSO	- National Statistics Office
ODA	- Overseas Development Assistance
OECE	- Overseas Economic Cooperation Fund of Japan
OIDCI	- Orient Integrated Development Consultants, Inc.

OPC	- Oversight Planning Committee
PCAMRD	- Philippine Council for Aquatic and Marine Research and Development
PFDA	- Philippine Fisheries Development Authority
PFDA	- Philippine Fisheries Development Authority
PNP	- Philippine National Police
QUEDANCOR	- Quedan Rural Credit and Guarantee Corporation
R & D	- Research and Development
RD&E	- Research, Development and Evaluation
RFO	- Regional Fisheries Organizations
SCOR	- Scientific Committee on Oceanic Research
SEA	- Southeast Asia
SEAFDEC	- Southeast Asian Fisheries Development Center
SSOP	- Sanitation Standards Operating Procedure
TAC	- Total Allowable Catch
TNA	- Training Needs Analysis
TWG	- Technical Working Group
UNDP	- United Nations Development Programme
UP AQUASOC	- University of the Philippines – Aquaculture Society
UP-CHE	- University of the Philippines – College of Home Economics
UP-MSI	- University of the Philippines – Marine Science Institute
UP-NSRI Institute	- University of the Philippines – Natural Sciences Research Institute
UPV	- University of the Philippines in the Visayas
UPV-CFOS Fisheries	- University of the Philippines in the Visayas – College of Fisheries and Ocean Sciences
USAID	- United States Agency for International Development
USFDA	- United States Food and Drug Administration
WFFF	- World Forum of Fishharvesters and Fishworkers
WHO	- World Health Organization

## *EXECUTIVE SUMMARY*

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The Philippines is endowed with rich fishery resources that supply a major part of the dietary requirements of Filipinos, provide substantial employment and contribute to export earnings. Despite institutional reforms and many project interventions, however, the fisheries sector has not been yet effectively managed in an integrated manner. At present, the sector is still confronted with a host of inter-connected problems and issues. These include depleted fishery resources brought about by excessive fishing effort, destructive fishing methods and open access regimes; degradation of fishery habitats through their conversion into other economic uses and due to negative impacts from land-based activities; and substantial reduction in value of catches due to improper post-harvest practices. Poverty is pervasive particularly among the small-scale fishers owing to very limited supplemental/alternative livelihood options. There is also inequitable distribution of socio-economic benefits from the use of fishery resources, as well as growing inter-sectoral and intra-sectoral conflicts. There are inadequate systems and structures for fisheries management owing to inappropriate policies, limited inter-agency coordination, weak law enforcement, and inadequate human resources.

In view of the above, this Comprehensive National Fisheries Industry Development Plan (CNFIDP) has been developed to provide the holistic and/or strategic framework to manage the fishery resources of the Philippines. The Fisheries Code of 1998 (RA 8550) specifically requires the formulation of a CNFIDP. This document provides the strategic directions to be undertaken over the next 20 years (2006-2025). In addition, this CNFIDP lays out the key project interventions that may be implemented over the first medium term plan (2006-2010). This plan builds on the gains of the previous national fisheries plans over the last three decades, starting with the Fisheries Industry Production Plan (1972-1986), and currently with the fisheries concerns subsumed within Chapter 2 (Agribusiness) Component of the Medium-Term Philippine Development Plan (MTPDP) for 2004-2010. This plan is a product of extensive consultations at all levels of governance, involving many concerned agencies and a whole array of stakeholders. The CNFIDP is likewise science-based, taking into account the best available scientific/technical information. Structurally, the plan is divided into five chapters.

Chapter 1 provides a general introduction to the CNFIDP. It consists of five sections, emphasizing the participatory process of plan development. Section 1.1 describes the aim of the CNFIDP, which is to promote the sustainable development and adaptive management of the Philippine fisheries sector. Section 1.2 highlights the planning process that formally started with the first consultative meeting in Subic, Zambales, from 21-23 in September 2004. Section 1.3 describes the analytical framework, taking into account a holistic view of the fisheries management system. The human and natural resource components of the fisheries sector are contextualized within the broader context of the Philippine society and the world at large. Section 1.4 outlines the structure of the plan, including the linkages of various elements. It wraps up with Section 1.5 concerning the plan's limitations.

Chapter 2 provides a status assessment (past and present) of the fisheries situation in the country including the bio-physical, socio-economic and institutional dimensions. The biogeographic setting describes the landscape in general and the spatial context of the

water resource base (coastal/marine and inland waters) for fisheries, highlighting the archipelagic nature of the country. Significant aquatic habitats describe the status of ecologically-important aquatic ecosystems, such as estuaries, mangroves, coral reefs, seagrass beds, and small islands. The socio-economic setting includes a description of population trends, key demographic features, labor force, employment, and income patterns. Sector economic performance includes macroeconomic performance of the fisheries sector in relation to the national economy. This is followed by an assessment of the fisheries sub-sectors (municipal and commercial capture fisheries, aquaculture and post harvest) in terms of the resource use utilization patterns, infrastructure, and marketing. The institutional support system includes a synopsis of the legal, policy and regulatory framework governing the management and development of fisheries including related global initiatives and Philippine commitments thereto, applicable national laws and executive issuances. The chapter concludes with an analysis of the key issues and problems confronting the sector as well as key development opportunities.

Chapter 3 is titled ‘Fisheries Sector Development Framework’ that focuses on the prognosis for the future. Covering five sections, this provides the conceptual link between the development issues and opportunities described in Chapter 2 and the management measures described in Chapter 4. Section 3.1 (Development Philosophy) covers the pertinent sustainable development concepts, such as inter- and intra-generational equity, holistic development, integrated management and carrying capacity. It also covers the relevant guiding principles specific to the fisheries sector that include precautionary principle, ecosystem-based management and decentralized administration. The strategic development trends/challenges follow in the next section. It includes the relevant macro global and regional items (e.g. globalization, climate change and population growth), as well as fisheries-specific concerns (e.g. increasing demand of fishery products, excess capacity, technological advances and biodiversity). Section 3.3 provides a prognosis for the Philippine sector in terms of the status and benefits; it highlights development scenarios in relation to the various driving forces. In terms of national food security, the main scenario is the increasing deficit in the supply of food fish due to the increasing population. Since such demand cannot be met from the municipal and capture fisheries, two pathways are desired: (1) expansion of environment-friendly aquaculture and (2) substantial reduction in post harvest losses.

The strategic vision and mission – over a 20-year period - as well as the goal and objectives of the CNFIDP follow. The sectoral vision is “A sustainable and competitive fisheries industry that contributes to food security and provides optimum socio-economic benefits to Filipinos,” while the CNFIDP’s goal over the long-term is to sustain the industry’s socio-economic benefits without jeopardizing the fishery resources and the associated habitats in the most administratively efficient and cost-effective manner. There are nine associated strategic objectives: (1) rationalize utilization of fishery resources, (2) protect fishery habitats, (3) reduce resource use competition, (4) maximize full potential of aquaculture, (5) promote competitiveness of fishery products, (6) minimize post harvest losses, (7) enhance capability of LGUs, NGAs and local communities, (8) promote appropriate fisheries policies, and (9) strengthen institutional partnership. Section 3.5 wraps up with the indicative program components and phasing. The first medium term plan (2006-2010) - which initially describe the five sub-sectors components (municipal capture fisheries, commercial capture fisheries, aquaculture, post harvest and institutional) - will strengthen the existing foundation of fisheries management.

Chapter 4 (Medium-Term Programs and Projects) tackles the specific measures and/or interventions proposed to address the various management problems and issues identified over the first five years (2006-2010). In effect, this chapter provides the five-year action plan. Each project (described briefly in 11-point elements) has an implementation period of between one to five years. In total, 35 priority projects have been identified for these five sub-sectors: (1) municipal capture fisheries, (2) commercial capture fisheries, (3) aquaculture, (4) post harvest, and (5) institutional. The eight projects for the municipal sub-sector are: Project 1 - Comprehensive Education Program for FARMC Fisherfolk Representatives; Project 2 - Validation of Priority Use Rights through Municipal Registration and Licensing; Project 3 - Enhancement of Locally Managed Marine Areas; Project 4 - Rehabilitation and Regeneration of Coastal Ecosystems; Project 5 - Sustainable Fisheries Livelihoods Support; Project 6 - Infrastructure and Postharvest Facilities Development for Municipal Fisheries; Project 7 - Fishery Law Enforcement Enhancement; and, Project 8 - Rationalization of Municipal Fishing Effort. These projects shall address the sustainable and equitable utilization on municipal fisheries resources for the benefit of small-scale fishers and coastal communities.

There are five projects for the commercial sub-sector, namely: Project 1 – Rationalization of Fishing Effort in Overfished Commercial Fishing Areas; Project 2 – Development and Implementation of a Monitoring, Control and Surveillance (MCS) System for Commercial Fisheries; Project 3 – Development, Adaptation, and Promotion of Selective Environmentally-Friendly and Cost-Effective Fishing Gear and Practices; Project 4 – Exploratory Fishing in EEZ and Beyond, and in Under-Exploited Commercial Fishing Grounds; and, Project 5 – Biology and Culture of the Pacific Bluefin Tuna (*Thunnus orientalis*). These interventions are geared towards the rational exploitation, sustainable development and conservation of fisheries and aquatic resources in Philippine commercial waters, including the EEZ and the adjacent high seas.

In the case of aquaculture, nine projects have been identified: Project 1 – Advocate a Focused, United, and Strategic Vision and Road Map for the Industry; Project 2 – Enhance RD & E Programs and Prioritize according to Immediate Needs of the Industry; Project 3 – Strengthen the Local Hatchery Industry; Project 4 – Developing Domestic Supply Chain and Expanding Export Markets for Aquaculture Products; Project 5 – Institutionalize Best Aquaculture Practices (BAP); Project 6 – Establish Standards for Quality and Implement Farm-Based HACCP; Project 7 – Rationalize Policies on the Introduction of Live Aquatic Organisms; Project 8 – Promote Agriculture Development through Special Economic Zones; and Project 9 – Empower Small Holders and Fisheries in Aquaculture. These projects shall contribute to the thrust of increasing the contribution of the aquaculture industry in national development through the adoption of progressive and economically competitive technology under a framework of social equity and environmental sustainability.

For the post-harvest sector, seven projects are proposed. These are: Project 1 – Strengthening of the Fish Inspection System in the Philippines; Project 2 – Development of National Quality Standards for Fish and Fishery Products; Project 3 – Marketing and Promotion of Philippine Fish and other Aquatic Products; Project 4 – The Development of New Value Added Fishery Products; Project 5 – Natural Marine Products; Project 6 – Reduction of Fisheries Post harvest Losses; and, Project 7 – “Model Villages for Philippine Fisheries Post-Harvest”. These projects will support the development of

comprehensive programs on product safety and quality systems, development of market and marketing systems for Philippine fish and other aquatic products, and eventual reduction of post harvest losses.

Concerning the institutional sub-sector, six projects have been proposed: Project 1 – Improving the Policy and Regulatory Framework for Fisheries; Project 2 – Building the Institutional Capacity of BFAR; Project 3 – Fisheries Management Capacity through Partnerships; Project 4 – Networks of Local Fisherfolks and Aquaculture Communities; Project 5 – Alliance for the Integrated Co-Management of Ecosystems; and, Project 6 – Upgrading Business Sector Capability. These projects shall address the critical capacity gaps of the institutional system, as well as develop the management capacity and institutional partnerships for effective management of the fisheries sector.

Plan Implementation (Chapter 5) describes the processes to be undertaken during the five-year implementation phase. The implementation plan for the sector will be based on the national priorities, as well as local needs. Section 5.1 on institutional arrangements cover the roles/responsibilities of the relevant agencies and stakeholders, including the relevant organizational structure. Although BFAR shall take the lead role in the implementation of the CNFIDP, a Fisheries Development Coalition (FDC) and a number of a number of partnership initiatives shall be established to assist in implementation of projects. Section 5.2 provides the indicative implementation schedule of the plan's individual projects. Some projects will be implemented on the first year (2006), while others will be implemented throughout the five-year duration.

The section on cost and financing (Section 5.3) summarizes the plan's total indicative cost of PhP 1,638.13 million to implement the 35 priority projects. The bulk of the budget goes to aquaculture (43%). This is followed by institutional (29%), postharvest (13%) and commercial (12%), and municipal at 3%. Aquaculture has the highest budget given that the supply deficit for food fish shall come from this sector; the institutional sub-sector has also a large budget as the time medium-term-plan will also focus on strengthening the institutional foundation. The CNFIDP projects will require an annual budget of PhP 324.1 million. External financing schemes will be explored given the limited capability of the national government, such as the private sector and international funding institutions.

Section 5.3 (monitoring and evaluation plan) includes the mechanism to monitor progress of plan implementation based on indicators and targets, and the protocol for re-assessing the efficiency of the plan. Reporting and feedback mechanisms will be used to build accountability among the stakeholders. As part of adaptive management approach the relevant elements of the CNFIDP will be revised as required and as agreed upon. The implementation of the above 35 priority projects is anticipated to strengthen the foundation towards sustainable development of the Philippine fisheries.

***PREFACE***

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To be done later

## ***ACKNOWLEDGEMENT***

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**To be done later**

# CHAPTER 1

## INTRODUCTION

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This chapter provides a general introduction to the Comprehensive National Fisheries Industry Development Plan (CNFIDP). Section 1.1 describes the aims of the CNFIDP which is to promote the sustainability of the Philippine fisheries sector. Section 1.2 highlights the interactive planning process that involve the participation of relevant stakeholders. Section 1.3 describes the analytical framework, taking into account a holistic view of the fisheries management system. Section 1.4 outlines the content/structure of the plan and wraps up with Section 1.5 concerning the plan's limitations.

### 1.1 Purpose of the Plan

The Philippines is naturally endowed with rich fishery resources and associated ecosystems. The fisheries sector is a significant component of the national economy. Many poor coastal dwellers derive substantial employment and income from the fisheries. Likewise, the sector contributes to export earnings and provides a major part of the dietary requirements of the population. The fisheries, however, has not been properly managed in an integrated manner. At present, the sector is confronted with a host of inter-connected problems and issues. Foremost are the depleted fisheries resources which are brought about by excessive fishing effort, destructive fishing methods and virtually open access regimes. The fisheries habitats are being degraded through their conversion into other economic uses, negative impacts from land-based economic activities and natural stresses. There is also substantial reduction in value of catches due to improper post-harvest practices.

Poverty is pervasive, particularly among the small-scale fishers, owing to very limited supplemental/alternative livelihood options. There is also inequitable distribution of socio-economic benefits from the use of fisheries resources. Inter-sectoral and intra-sectoral conflicts are growing, as a result of weak collaboration among stakeholders. Institutionally, there is inadequate systems and structures for fisheries management. Inadequate fisheries policies, limited inter-agency coordination, weak law enforcement, and inadequate human resources have brought about this situation.

This CNFIDP - covering the period from 2006-2010 - is designed to provide the comprehensive framework to manage the fisheries resources of the Philippines. The Fisheries Code of 1998 (RA 8550) specifically requires the formulation of the CNFIDP. This document provides the strategic directions to be undertaken over the next 20 years (2005-2025). In addition, it lays out the key program and project intervention that must be implemented over the next five years. The CNFIDP contains both development (eg. expansion programs, physical infrastructure support, marketing assistance, etc) and conservation (eg. stock enhancement, habitat restoration, etc) initiatives. It supports the implementation of the six critical actions needed to sustain the country's fisheries (Luna et

al 2004): reduction and rationalization of fishing effort, protection/rehabilitation of fisheries habitats, improved utilization of harvest, enhanced local stewardship and management of resources, supplemental/alternative livelihood for fishers, and capacity building and institutional strengthening. This plan builds on the country's previous fisheries plans over the last three decades (Table 1.1.a). In the latest Medium-term Philippine Development Plan (MTPDP), the fisheries concerns are subsumed within Chapter 2 (Agribusiness) Component.

**Table 1.1.a National Plans Pertaining to Philippine Fisheries, 1987-2005**

1. Fisheries Industry Production Plan, 1972-1986
2. First National Fisheries Policy and Plan, 1987
3. Second National Fisheries Policy Plan for Industry, 1996
4. Medium-Term Fisheries Management and Development Program - A Component of the Medium-term Agricultural Development Plan (MTADP), 1993-1998
5. President Erap's Agrikulturang Maka-masa (Fisheries), 1999-2004
6. Ginintuang Masaganang Ani for Fisheries Program (2002-2004)
7. Chapter 2 (Agribusiness) Component of the Medium-term Philippine Development Plan, 2004-2010

Note: The first plan was an output of the National Conference on Fisheries Policy and Planning, Baguio City, 1987 while the second plan resulted from the National Fisheries Workshop on Policy Planning and Industry Development, Puerto Azul, Cavite, 1996. Prior to that, BFAR implemented a Fisheries Industry Production Plan that focuses on production and extension services.

The CNFIDP satisfies the three main requisites of a national fisheries plan. One, it contains all the critical planning elements, such as exhaustive problem analysis/diagnosis, projections of benefits, scenario prognosis, programmatic interventions, institutional arrangement and monitoring and evaluation. Two, the CNFIDP is a product of extensive consultations at all levels, with various concerned agencies and stakeholders. Three, the plan is science-based, taking into account the best available scientific/technical information.

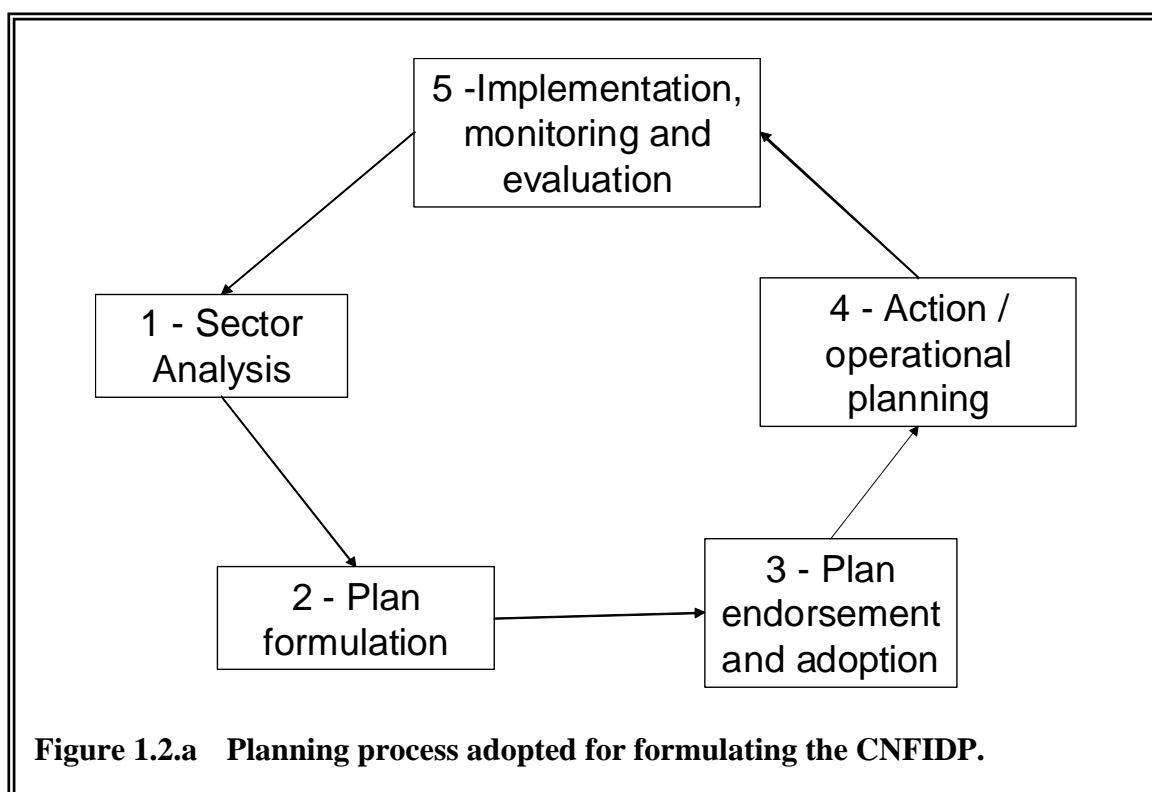
## 1.2 Planning Approach and Process

The planning process adopted for the CNFIDP follows the typical cycle being used in many sectoral planning exercises (Figure 1.2.a). Six intricately related and overlapping steps are presented. The first step constituted sector analysis<sup>1</sup>. The issues, problems and opportunities confronting the fisheries sector (and sub-sectors) were evaluated. These involved assessment of existing literature, as well as a series of multi-stakeholder consultations. Problems were structured into cause-effect relationships. Plan formulation

<sup>1</sup> This phase formally started with the first consultative meeting in Subic, Zambales, from 21-23 in September 2004. Details of this meeting are available as a Proceedings Number 1.

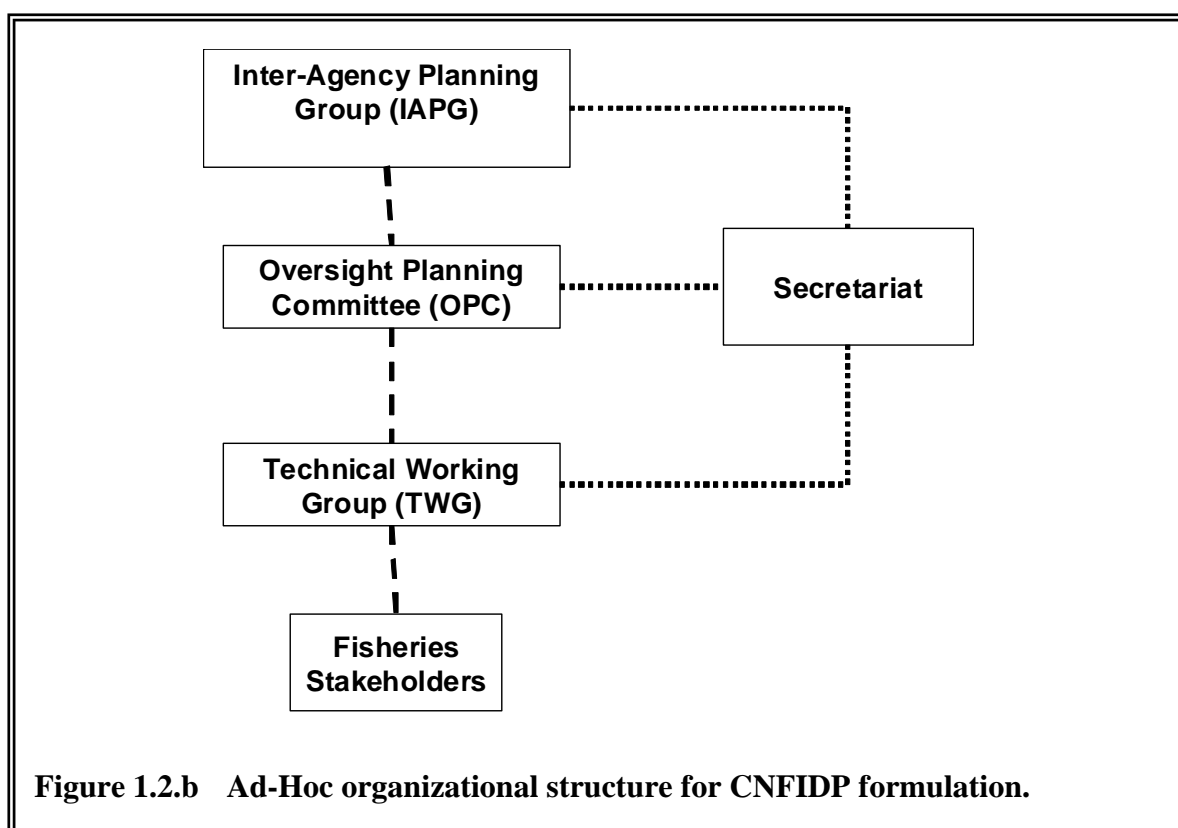
followed<sup>2</sup>. This step involved a visioning exercise, transformation of the problem statements into objective statements, and evaluation of development scenarios. Then, the objective statements were developed into clusters of program ideas, which were later developed into more discrete projects. Each project is presented into a project brief format. Nearly twelve months were required to complete the first two steps.

Stage 3 refers to the plan endorsement and adoption. The endorsement will be done at three levels. The elements would be agreed first at the level of the Technical Working Group (TWG). Then, the plan shall be endorsed by the Inter-Agency Planning Group (IAPG). Finally, the CNFIDP shall be endorsed/adopted through a national forum or consultation. The first three steps are expected to be completed within one year. Once the plan has been officially adopted, Stage 4 (action/operational) follows. Under this stage, the plan elements shall be translated into activities or actions that can be readily implemented. For example, the project concepts/ideas/briefs under rehabilitation programs shall be translated into full project proposals. A specific project may be proposed for mangrove reforestation of a certain village or a bay. Stage 4 shall be completed within Year 2 of the plan. The fifth and last stage is project implementation, monitoring and evaluation (M&E). The individual projects will be executed on the ground. The M&E system must be able to track the implementation of individual projects, as well as the progress of the entire plan. Stage 5 is expected to commence towards the middle or later part of Year 2.



<sup>2</sup> Activities include the Visioning Workshop held at the BFAR Central Office on 14 April 2005 and followed by Scenario Planning Workshop held at the FISH Project Office from 21-22 April 2005. Details of these workshops are available as a Proceeding Number 2 and Proceeding Number 3, respectively.

There was a ‘composite’ planning team involved in developing the CNFIDP (Figure 1.2.b). The three-level planning group operated closely with one another. On top is the IAPG, which served as the approving/endorsing body. It is composed of the heads and/or representatives of key fisheries-related agencies<sup>3</sup>. The IAPG also provided specialist inputs. At the second tier was the Oversight Planning Committee (OPC), which was largely responsible for orchestrating the writing and packaging of the CNFIDP. The OPC consisted of representatives from three entities: the premier national fisheries management agency, the Bureau of Fisheries and Aquatic Resources (BFAR); an external project funded by the United States Agency for International Development - Fisheries Improved for Sustainable Harvest (USAID-FISH Project); and a private consulting firm Orient Integrated Development Consultants, Inc (OIDCI). The TWGs provided technical inputs to various elements of the plan. Its members come from the government agencies (local and national), academic and research institutions, civil society groups and the private sector. In addition, the TWGs undertook the necessary consultations with the relevant stakeholders.



Between September 2004 to September 2005, the planning team coordinated the conduct of major consultations (Table 1.2.a). These exclude several small-group meetings and seven regional consultations led by BFAR. The Consultative Meeting in Subic (September 21-23, 2004) formally started the process. During the first quarter of 2005, the consultations of various TWGs were undertaken. In the second quarter, the visioning and scenario planning workshops were held. These workshops provided the foundation for

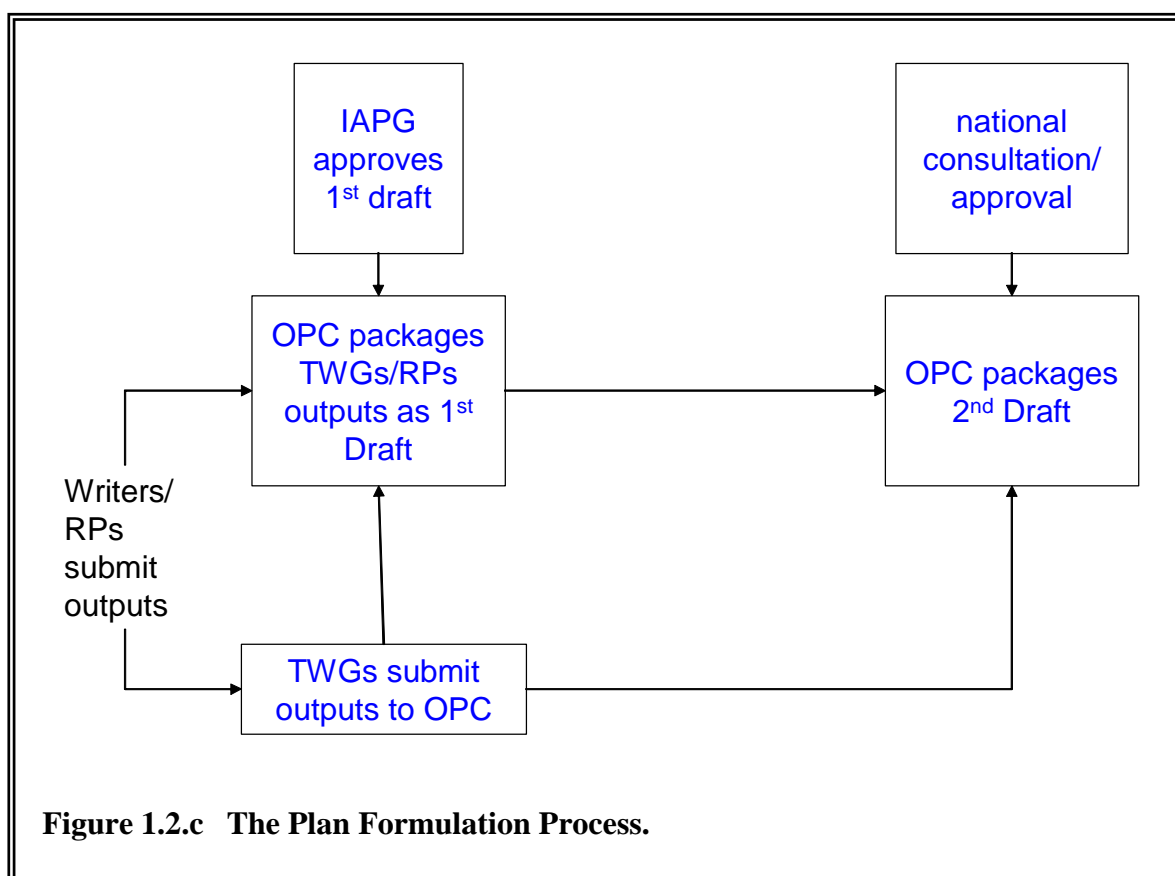
<sup>3</sup> Agencies included as members of the IAPG included BFAR, PFDA, PCAMRD, UPV, UP-MSI and DENR

developing the plan's strategic directions and objectives. The third quarter was devoted to IAPG and selected consultations for refinement and endorsement of the plan.

**Table 1.2.a Major consultations for the formulation of the CNFIDP.**

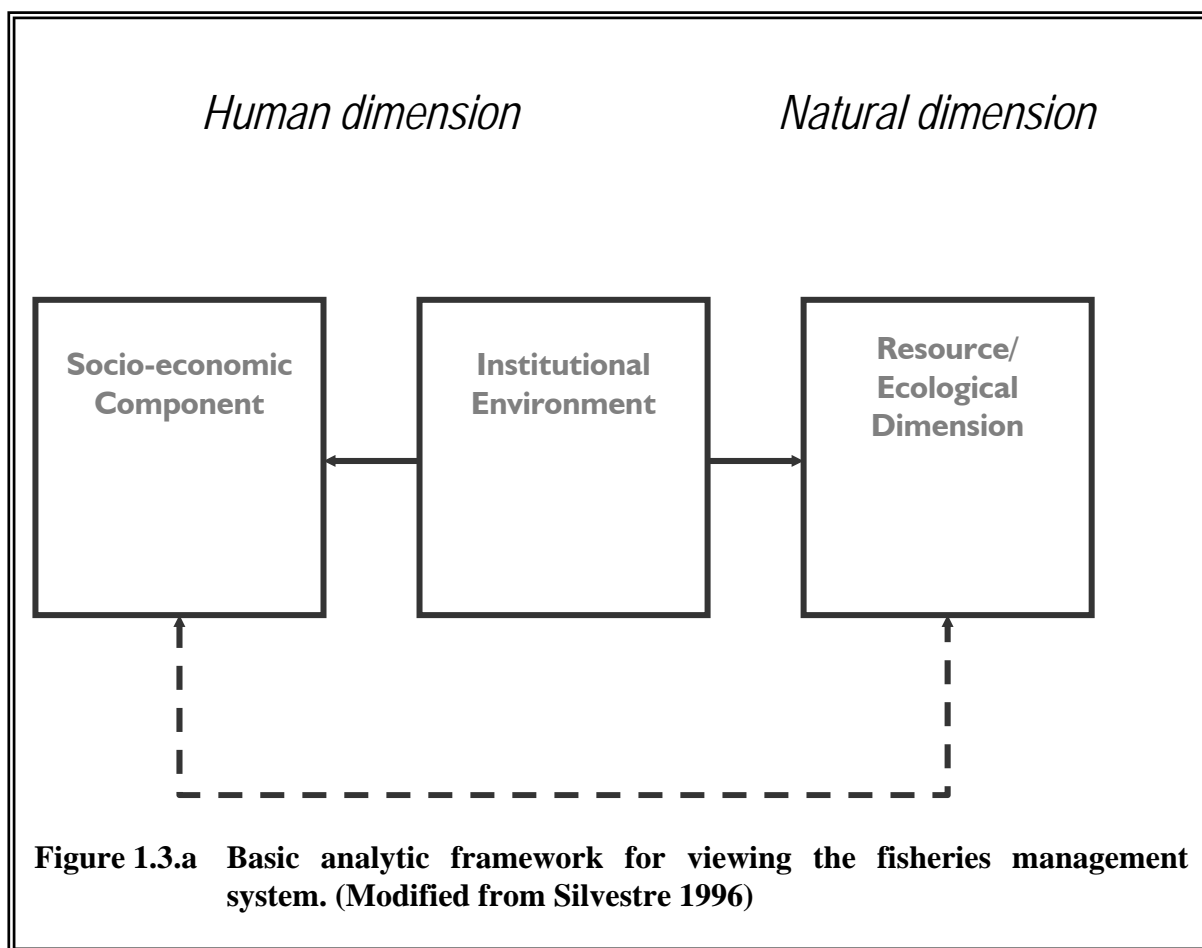
Activity	Participants	Date / Venue
First Consultative Meeting for the Preparation of the Comprehensive National Fisheries Industry Development Plan	NGAs, Private Sectors, Academe, NGOs, POs, OPC	Sept 21-23, 2004 (Subic, Zambales)
CNFIDP E-Group development and initial invitation to Core TWGs	TWGs, OPC	Nov 16, 2004
Core TWG Consultative Meeting	Core TWG members, OPC	Dec 14, 2004 (FISH Project Office, Pasig City)
Commercial and Municipal Fisheries TWG Meeting	Commercial and Municipal Fisheries TWG Members, RPs, OPC	Jan 5, 2005 (FISH Project Office, Pasig City)
Aquaculture and Post Harvest TWG Meeting, FISH Project Office, Ortigas Center, Pasig City	Aquaculture and Post Harvest TWG Members, RPs, OPC	Jan 13, 2005 (FISH Project Office, Pasig City)
Institutional TWG Meeting, FISH Project Office, Ortigas Center, Pasig City	Institutional TWG Members, RPs, OPC	Jan 25, 2005 (FISH Project Office, Pasig City)
The CNFIDP: Elements, Formulation Process and Current Status (Orientation for BFAR Regional Directors)	BFAR Regional Directors, RPs, TWG, OPC	March 1, 2005 (BFAR Central Office, Quezon City)
Visioning Workshop for CNFIDP	BFAR, Private Sectors, Research Institutions, NGOs, Academe, OPC, TWGs, RPs	Apr 14, 2005 (BFAR Central Office, Quezon City)
Scenario Planning Workshop/Sector Development Framework	BFAR, TWGs, RPs, OPC	Apr 21-22, 2005 (FISH Project Office, Pasig City)
BFAR Regional Consultations	BFAR, representatives from government and industry	March – April 2005 (Mindanao)
Presentation of Outputs to TWGs	TWG members, selected resource persons and representatives	July 2005 ((BFAR Central Office, Quezon City and FISH Project Office, Pasig City)
Review of Draft CNFIDP	TWG members, selected resource persons and representatives	August 16-17; September 6-7; 21, 2005 (FISH Project Office, Pasig City)
Presentation of Draft CNFIDP in Congress	Congressmen and selected representatives	September 22, 2005

The planning, consultation and packaging processes for the CNFIDP are reflected in Figure 1.2.c. It illustrates the specific roles and responsibilities performed by the various planning teams over a one-year period. The CNFIDP underwent two major drafts before being subjected to a national consultation. The post-national consultation activities pertained to the refinement and legitimization of the plan.



### 1.3 Analytical framework for the CNFIDP

The analytical framework is based on the premise that a fisheries management system is composed of two broad dimensions: (1) human dimension and (2) natural dimension (Figure 1.3.a). These dimensions, which interact dynamically, explain the essential inter-relationships and inter-dependence of human and resource/environment components within a fisheries system. The human dimension is comprised of the socio-economic component and institutional environment. Among others, the legal and policy frameworks, implementing mechanisms, and plans/programs are contained in such institutional environment. This in turn determines the types of socio-economic activities that can be undertaken pertaining to the fisheries. Human activities/actions determine the flow of fishery resources over time. In the Philippines, the relevant human activities which impact on the state of the fishery can be broadly classified into four sub-sectors, namely: (1) municipal capture fisheries; (2) commercial capture fisheries; (3) aquaculture; (4) and post harvest. Performance in each of these sub-sectors affects or influences the state of the Philippine fisheries industry.



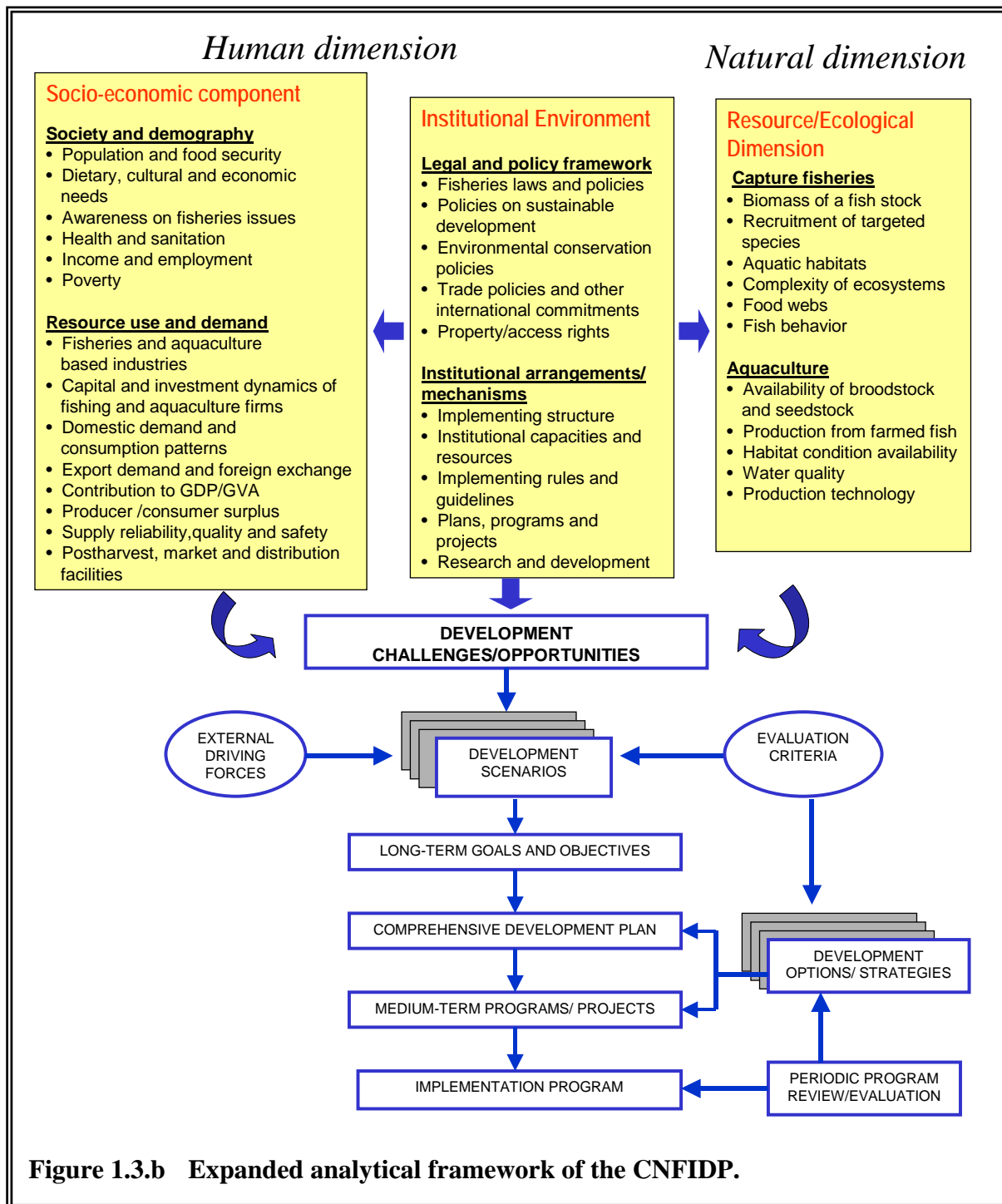
The natural dimension sustains the flow of goods and services that are derived from the fishery resources. Examples of goods are the fishery products harvested from the wild or from aquaculture/mariculture. The benefits, on the other hand, are in terms of nutrition, incomes, employment and export earnings. The framework recognizes that the fishery resources emanate from, and are sustained by the natural ecological processes and relevant habitats. Hence, the institutional environment influences the resource use patterns.

Generally, the sustainability of a fishery can be characterized by ecological, economic, and social dimensions. However, traditional planning techniques do not integrate socio-economic factors, institutional aspects and natural resources altogether. Development planners and decision-makers are now expected to integrate social-economic, institutional and ecological/natural resource factors at all levels of planning (UNCED, 1992). Hence, a broad conceptual framework as reflected in Figure 1.3.a. combining biological information with fishery socio-economics is needed for both qualitative and quantitative analysis of fisheries management situations. Such framework is modified from the paradigm earlier developed in San Miguel Bay (Silvestre, 1996), and used as a guide in the DA-BFAR book titled 'In turbulent seas: The status of Philippine marine fisheries' (Luna et al, 2004). Such system view of a fisheries management system recognizes that the institutional, socio-economic, and natural resource considerations should be integrated to provide a more comprehensive assessment of the fisheries sector to promote its sustainable development.

Based on the basic premise, Figure 1.3.b acknowledges the need to contextualize the sustainability of the fisheries through an integrated analysis of human dimension (social-economic component and institutional environment) and natural dimension

(resource/ecological factors). It elaborates that institutional, socio-economic, and natural resource considerations should be integrated to provide a more comprehensive assessment of the fisheries industry using a multi-disciplinary approach. Without any effective legal and policy framework, it is likely that both the wild stocks and cultured species will not be sustainably managed. In capture fisheries, for example, policy and regulation affect fishing fleets. Fleet size and composition change in response to market prices, biological conditions, and the regulatory environment. Policy instruments for fisheries management exist at the international level, such as the United Nations Millennium Development Goals and the Food and Agriculture Organization's Code of Conduct for Responsible Fisheries. These provide guidelines for the development of fisheries policy instruments at the national and local levels. Policy design considerations include, among others: provisions for economic incentives, profitability, enforcement and compliance. Policy and regulatory actions will result in changes to the ecological/fishery resource base and the socio-economic well-being in terms of the: (1) goods and services that are available from the use of the fishery resources and, (2) factors of production used to provide those goods and services.

Legal and policy frameworks influence the institutional arrangements/mechanisms. The main national laws are the 1998 Fisheries Code and the 1997 Agriculture and Fisheries Modernization Act. Their objectives are poverty alleviation, social equity, food security, rational use of resources, people empowerment, and sustainable development. The basic operations are through the Local Government Units (LGUs) and the Fisheries and Aquatic Resource Councils (FARMCs) for municipal waters, and the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR) for all fisheries and aquatic resources other than municipal waters. Other crucial national laws are Local Government Code of 1991 (RA 7160) and National Integrated Protected Areas System (NIPAS) Act of 1992 or RA 7586. These in turn define the roles of the institutions and responsibilities of other stakeholders involved. Currently, the BFAR is the lead national agency for fisheries management; however, most of the local-level fisheries management functions have been delegated to the LGUs. The partnerships and coordination operate at the various levels of organizational hierarchy. Institutional capacities and resources vary among individual organizational entities. In general, the manpower support of the LGUs that are devoted to the sector has been fairly limited. The resources allocated for research and development (R&D) are limited compared to those provided by the counterpart agencies in other Southeast Asian countries. National fisheries plans contain the specific programs, projects and activities for the sector. The last plan was the Ginintuang Masaganang Ani for Fisheries Program (2002-2004), while the current programs and projects for the fisheries are contained in the Agribusiness Component of the Medium-term Philippine Development Plan, 2004-2010. Associated with the CNFIDP are the municipal fisheries development plans, comprehensive post-harvest and ancillary industries plan, as well as national commodity (road maps) plans. Although BFAR is taking the lead, other national government agencies, such as the Department of Environment and Natural Resources (DENR), as well as Non-government Organizations (NGOs) and the private sector, are likewise involved in developing and implementing some initiatives.



**Figure 1.3.b Expanded analytical framework of the CNFIDP.**

In the Philippines, the fisheries provide socio-economic benefits in terms of food, employment, recreation, trade and socio-economic well being for people. Domestic food security issues are at the core of the fisheries sector's importance to the national economy. The importance of the fisheries industry is also being realized through its contribution to international trade and the resultant foreign exchange that this trade generates. The socio-economic perspective examines how regulatory action affects demand for fishery products, capture fishing opportunities, aquaculture, the supply of fish and fish products, postharvest, market and distribution interactions. These, in turn, affect fishing decisions and the conditions of the fisheries resources and their habitats. Competing fishing firms base their decisions on deployable capital, necessary efforts and on the observed state of the target species. Socio-economic considerations include potential changes in prices, quantities produced or consumed, and fishing trips as a result of changing supply and demand conditions in the marketplace. FAO (2002) states that continued levels of poverty in small-scale fishing communities and those in many inland waters contribute to failures in management and policy-making directed at preventing over-exploitation, stock decline, and exacerbation to rural food insecurity. The types and direction of expected socio-economic effects on the fishery resources, their habitats, and those who benefit from these resources include the following: (1) changes in net benefits; (2) changes in the distribution of benefits and costs; and (3) changes in employment and income in fishing communities.

Central to the socio-economic component of the analytical framework is the concept of supply and demand. In every market, there are both buyers and sellers. The buyers' willingness to buy fish/fish products at various prices reflects the changes in the prices of related goods, changes in income and changes in consumer preferences. The sellers' willingness to supply fish in turn is affected by the changes in the price of other goods, changes in the prices of inputs and changes in technology. The demand for fisheries is expanding because of increasing population. Thus, domestic demand and consumption patterns of fishery products shape fisheries and aquaculture based industries. Trade policies in turn, have an influence on export products, which contribute to the country's foreign exchange earnings. The continued supply of the quality and safe fishery products are dependent on the ecological and resource base conditions. Broadly, the fishery resources may be classified into reef species, demersals, small pelagics, large pelagics, deepwater stocks and freshwater species from rivers and lakes. For capture fisheries, reductions in the fish stock due to mortality or out-migration would be offset by increases in the fish stock due to births, growth of the fish in the remaining stock, and in-migration. The natural equilibrium size of a fish population is the population size, which would persist in the absence of outside influences. If fish stock exceeds the natural equilibrium, the capacity of the habitat (carrying capacity) is exceeded. Catch is commonly used as an estimator for the abundance of biomass. This situation changes when a management authority introduces measures imposing restrictions on the fishery (e.g. on gear type, allowable catches, amount of effort, etc.). Such limitations change the decisions made by fishing firms. Restrictions are perceived as constraining economic opportunities. Fishing mortality is a function of effort levels that are determined by market and biological conditions and by fishery regulations. The dynamics for aquaculture species are quite different, given that many environmental factors/parameters can be controlled or manipulated through technology. Thus, the production from farmed fish is reliant on habitat condition, water quality and the availability of broodstock/seedstock. Ecosystem processes are the driving forces in the health and productivity of marine and freshwater resources. Their maintenance is the key to protecting fisheries biodiversity. Factors that affect biological diversity include ecosystem integrity,

condition of critical habitats, endangered species and non-target fish species. Water quality is particularly important in the case of aquaculture. The analytical framework is further operationalized into specific chapter elements of the CNFIDP (Figure 1.3.c). These chapter elements are elaborated in the succeeding section.

The analytical framework identifies/describes the linkages among the institutional, socio-economic and ecological aspects of the fisheries industry. Aside from looking at the direct beneficiaries and other stakeholders in the sector, the framework provides an understanding of the linkages between the activities undertaken by the stakeholders and the wider influences of society, culture, political structures and process, and economic processes. The result is a comprehensive assessment of the critical problems to be addressed, strengths in the fisheries sector on which to build on, and the opportunities for development in the fisheries industry. Finally, the framework provides a venue for evaluating partnerships among stakeholders and the role of institutions in identifying development options and strategies for intervention.

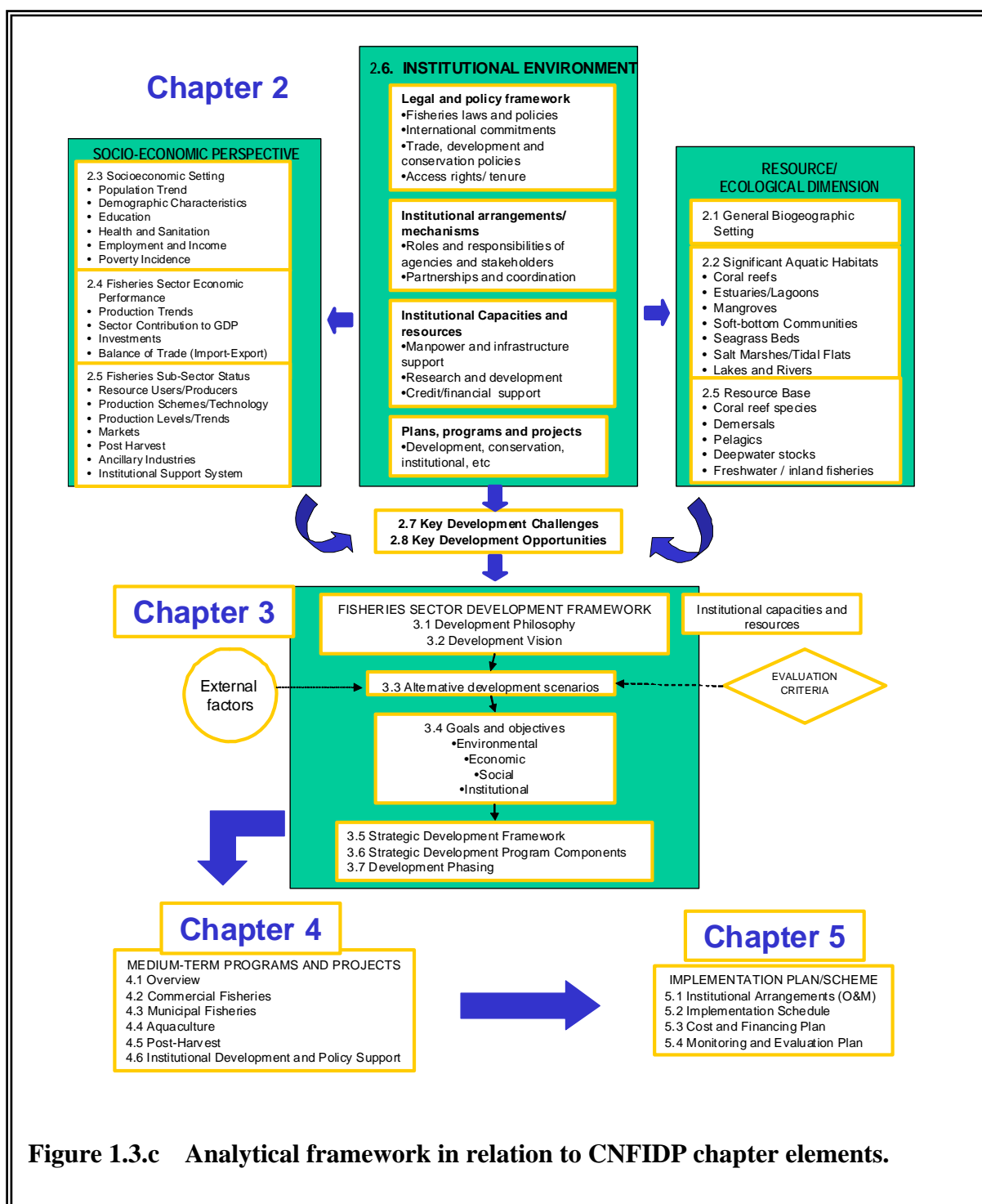


Figure 1.3.c Analytical framework in relation to CNFIDP chapter elements.

## **1.4 Content/Structure of the Plan**

Structurally, the CNFIDP is divided into five core chapters. Chapter 1 provides the general introduction and the contextual background materials. Among others, it describes the plan's rationale, and framework, as well as the plan's process, content and scope.

Chapter 2 (Fisheries Overview) is technically a profile that provides a description of the Philippine fisheries industry. It includes an assessment of the ecological health of the fishery resources and all threats and impacts to be addressed; a comprehensive inventory and assessment of the fisheries industry in terms of socio-economic interests; and an inventory and gap analysis of existing legal, jurisdictional and management approaches and structures. Key development challenges and opportunities are identified based on secondary literature and a series of consultations.

Chapter 3 (Fisheries Development Framework) may be viewed as the 'heart' of the CNFIDP. It consists of five sections. Section 3.1 describes the development philosophy, as well as the guiding principles. The plan is hinged on a shared vision of seeing a sustainable fishery over the long-term. The next section covers the relevant global trends that include globalization and climate change, among others; it also covers fisheries-specific items, such as the increasing demand for fishery products and biodiversity concerns. Section 3.3 provides a prognosis for the sector in terms of the status and benefits; various development scenarios in relation to the driving forces are highlighted. The strategic vision and mission, as well as the goal and objectives follow. Lastly, the indicative program components and indicative phasing follows. The program components (municipal capture fisheries, commercial capture fisheries, aquaculture, post harvest and institutional sub-sectors) are initially described here.

Chapter 4 (Medium-Term Programs and Projects) tackles the specific measures and/or interventions proposed to address the various management problems and issues identified over a period of five years.. The objective of the medium-term plan is the design of the link between inputs, outputs and outcomes, which ensures consistency of sectoral expenditure levels with the overall resource constraint. These programs and projects as 'action elements' have time frames of between one to five years. Specific projects are developed along the five sub-sectors, namely: municipal capture fisheries, commercial capture fisheries, aquaculture, post harvest and institutional. Project briefs are prepared for twenty 28(?) priority projects.

Plan Implementation (Chapter 5) describes the processes to be undertaken during the five-year implementation phase. The implementation plan for the sector will be based on the national priorities, as well as local needs. Institutional arrangements cover the roles/responsibilities of the relevant agencies and stakeholders, including the relevant organizational structure in a collaborative mode. This is based on the premise that agencies with the capabilities and responsibilities will implement the agreed management measures as part of their commitment to the process. The section on cost and financing provides the indicative cost of program/project activities, as well as the potential funding sources. External financing schemes will be explored given the limited capability of the national government, such as the private sector and international funding institutions. The monitoring and evaluation component includes the mechanism to monitor progress of plan

implementation based on indicators and targets, and the protocol for re-assessing the efficiency of the plan. Reporting and feedback mechanisms will be used to build accountability among the stakeholders. As part of adaptive management approach, all elements of the integrated management will be revised as required strategies on a regular and agreed basis.

## **1.5 Scope and Limitations**

As a policy tool, the CNFIDP is delimited in terms of the types of fisheries included, the geographical coverage, the temporal dimension and the management interventions. While the plan covers all types of fisheries, it pays particular attention to the following sub-sectors: aquaculture, commercial, municipal and post-harvest. The CNFIDP covers the inland and marine fisheries within the territorial jurisdiction of the Philippines. In terms of time, the strategic directions are geared over a 20-year period. The specific projects, however, are programmed over a five-year (2006-2010) time frame. Such projects may be translated later into full proposals either in site-based management plans or operational plans of relevant fisheries-related bureaus or agencies.

This chapter provides the general introduction to the plan. It describes five sections: (1) rationale of the plan, (2) planning process, (3) analytical framework, (4) content/structure of the plan, and (5) plan limitations. The next chapter contains the overview (profile) of the Philippine fisheries.



## CHAPTER 2

### *OVERVIEW OF PHILIPPINE FISHERIES*

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This chapter provides a status assessment of the fisheries situation in the country including the bio-physical, socio-economic and institutional dimensions. The biogeographic setting describes the landscape in general and the spatial context of the water resource base (coastal/marine and inland waters) for fisheries highlighting the archipelagic nature of the country. Significant aquatic habitats describe the status of ecologically-important aquatic ecosystems, such as estuaries, mangroves, coral reefs, seagrass beds, and small islands. The socio-economic setting includes a description of population trends, key demographic features, labor force, employment, and income patterns. Sector economic performance includes macroeconomic performance of the fisheries sector in relation to the national economy. This is followed by an assessment of the fisheries sub-sectors (municipal and commercial capture fisheries, aquaculture and post harvest) in terms of the resource use utilization patterns, infrastructure, and marketing. The institutional support system provides a synopsis of the legal, policy and regulatory framework governing the management and development of fisheries, including related global initiatives and Philippine commitments thereto, applicable national laws and executive issuances. The chapter concludes with an analysis of the key issues and problems confronting the sector and key development opportunities.

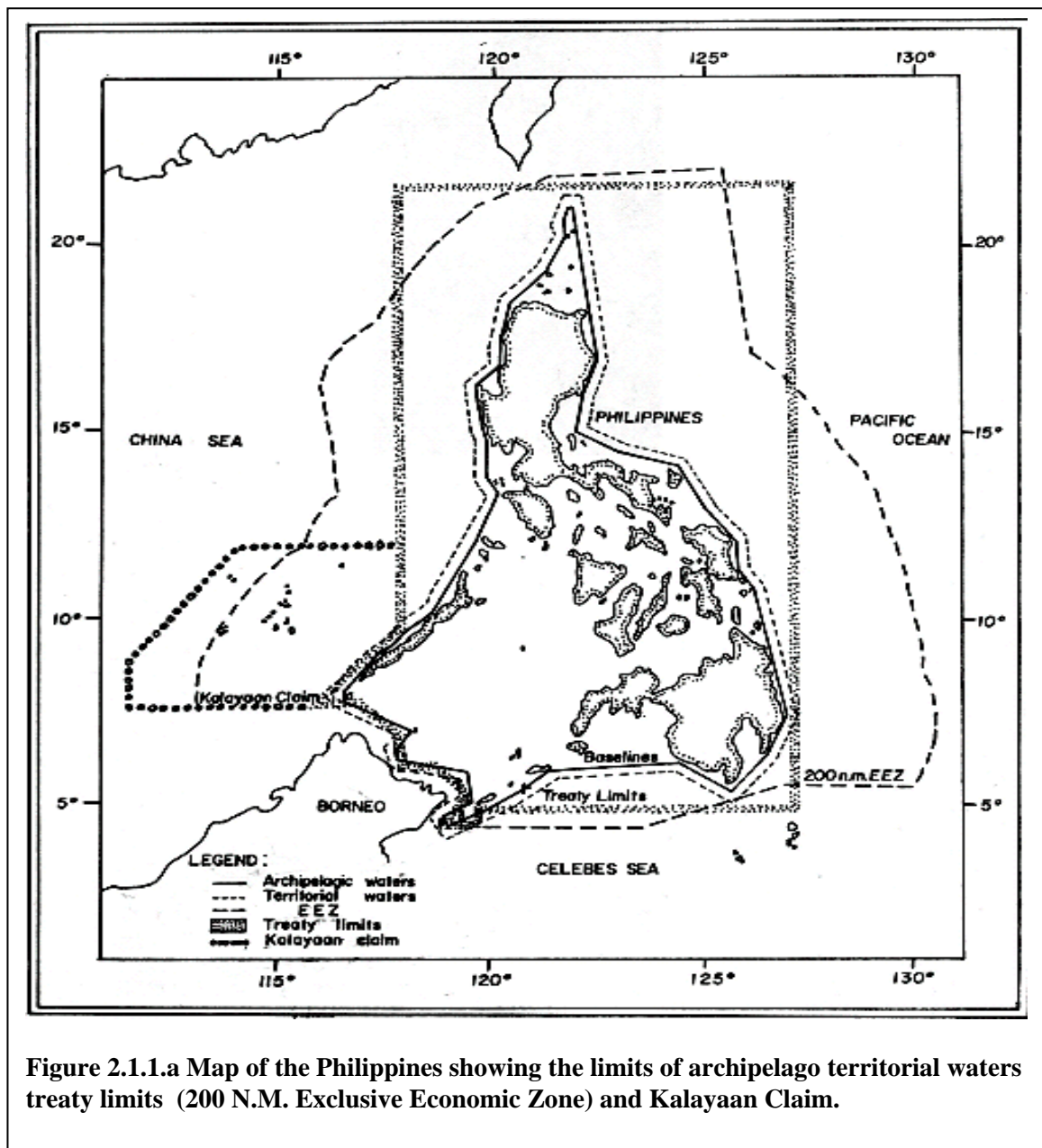
## **2.1 Biogeographical Setting**

This section describes the landscape setting in the country in general and the spatial context of the water resource base (coastal/marine and inland waters) for fisheries. It highlights the archipelagic setting of the country in particular, including the fisheries-related general features and territorial classification, boundaries and jurisdictions.

### **2.1.1 Geographic Setting**

The Philippines is an archipelagic country consisting of more than 7,100 islands lying north of the equator and on the western rim of the Pacific Ocean. The total land area is about 298,170 km<sup>2</sup>. The territorial seas are bounded by: in the north by Taiwan through the Bashi Channel; in the east by the Philippine Sea; in the south by the Celebes Sea; and in the west by the South China Sea.

It extends about 2,000 km in a south-north direction, from the northeast coast of Borneo to 150 km off Taiwan. The total territorial water area, including the exclusive economic zone (EEZ), is about 2.2 million km<sup>2</sup> (Figure 2.1.1.a). From this total, 266,000 km<sup>2</sup> is considered coastal while 1,934,000 km<sup>2</sup> is classified as oceanic. The shelf area, down to 200 m, covers 184,600 km<sup>2</sup>. Coastline length is about 17,460 km.



## 2.1.2 Geology

The Philippine Archipelago has a composite geologic structure arising from the multi-stage development of volcanic-tectonic events. This is evidenced by volcanism and seismic activity occurring along the active blocks of the major structural lines which traverse most of the major islands. At least 50 million years of transformation resulted in what is now more than 7,100 islands with unique assemblages of biological and cultural forms. The islands that now make up the archipelago began as oceanic islands, while Mindoro and Palawan emerged as a result of the continental drift from south China. Hence, the plants and animals on which the early inhabitants survived were oceanic in origin. The relative isolation of most of the Philippine islands from the rest of Asia has critical implications for appreciation of biodiversity in the country. This explains the very high percentage of endemism in flora and fauna found in the country – the presence of

many rich biogeographic regions and diverse ecosystem types result from the separation of the islands from each other, despite the dry lands that connected them when the sea water was much lower, as well as the tectonic movements that created our diverse land forms and water bodies. Multiple datasets show that marine biodiversity reaches global maxima in the Indo-Malay-Philippines archipelago, and there is a higher concentration of species per unit area in the Philippines than anywhere in Indonesia, including Wallacea (Carpenter and Springer 2005). Hence, these authors contend the Philippine islands as the center of marine shorefish biodiversity, and therefore, deserve special conservation measures for fisheries.

### **2.1.3 Topography/Landscape System**

The Philippines is composed of three major islands: Luzon, Visayas, and Mindanao. Being largely volcanic in origin, the topography is generally mountainous. Mountain ranges extend north to south, running parallel to the coasts and, in many places, bordering them. The key mountain ranges in Luzon include the Sierra Madre, Cordillera Central, the Caraballo Mountains and the Zambales Mountains. Situated in Mindanao are the Diwata Mountains and the mountain ranges in southern Mindanao including Mount Apo, which is the highest point in the Philippines at 2,954 meters.

Seismic disturbances are often experienced due to some 20 active volcanoes. The larger islands have a more diversified topography, with rivers, broad plains and level, fertile valleys in the interior. Among others, Luzon has the Cagayan Valley (a plain about 80 kilometers wide), the Central Plain (extending from Lingayen Gulf to Manila Bay), the Cagayan River (longest river in Luzon), Chico River, the large Laguna de Bay, and the Bicol River basin. Mindanao contains the Mindanao Valley (the largest lowland area) and the Agusan River basin.

### **2.1.4 Meteorology and Climate**

The Philippines has a tropical climate. On most islands, the rain season occurs during the summer monsoon (May to November) when the wind blows from the southwest; the dry season occurs during the winter monsoon (December to April), when the wind blows from the northeast. It has a mean annual temperature of about 27°C with ranges from 21°C to 34°C.

Rainfall averages 2,030 mm/year in the lowlands. Being within the cyclone belt, it is affected by around 15 cyclones per year. Such cyclones have bearing on fishing activities along the Pacific sea board.

## **2.2 Significant Aquatic Habitats**

The fishery resources are dependent on the conditions of the aquatic habitats/ecosystems. Hence, the protection and/or conservation of these habitats/ecosystems are crucial to the long-term sustainability of the fisheries. The key fishery habitats are briefly described below.

### **2.2.1 Coral Reefs**

The country's coral reef area is estimated at 27,000 km<sup>2</sup>, the second largest in Southeast Asia. Reef fisheries occur within the 10-20 fathoms. There are 915 reef fish species, and more than 400 scleractinian coral species. Destructive fishing techniques are the key contributors to reef degradation in the Philippines. These include *muro-ami*, as well as blast and cyanide fishing. Coastal infrastructure development, agriculture and land-cover change threaten many Philippine coral reefs. Over 80 % of original tropical forests and mangroves in the Philippines have been cleared, increasing sediment outflow onto reefs. Mangroves continue to be converted into fishponds, a change that allows more nutrients and sediment to reach reefs. Domestic and industrial wastes are rarely treated and are often discharged into the sea.

The first ever mass-bleaching event in the Philippines was reported in 1998-99. Such destructive fishing practices and negative impacts from land-based activities have destroyed 70% of fisheries within 15 km<sup>2</sup> of the shore. More recent surveys in 1997 found only 4% of Philippine reefs in excellent condition (over 75% hard or soft coral cover). The Visayas have experienced the most significant decline in coral cover, exhibiting an average of only 11%. A model estimates that 98 % of Philippine reefs are at risk from human activities, with 70 % at high or very high risk.

### 2.2.2 Mangroves

Mangrove communities are categorized into: (1) mangrove swamps composed mainly of large trees and associates, and (2) nipa swamps which are characterized by stemless palm growths. Forty-one species are identified in the Philippines. Mangroves provide nursery grounds to a host of fish species. Some 450,000 ha of mangroves in 1918 was reduced to only 120,000 ha in 1994. The main factor in the decline is due to aquaculture. About 239,323 ha of mangroves have been converted into brackish water fishponds. From 1918 to 1970, an average of 3,100 ha of mangroves was lost every year, increasing to about 8,200 annually from 1970 to 1988.

Other contributing factors are reclamation for residential and industrial purposes, over harvesting of mangrove trees for charcoal or fuel wood production, lack of reforestation, and physical expansion of coastal communities. Nearly 95% of the remaining mangroves are secondary growth, and only 5% are old growth which is mostly found in Palawan. Most mangrove areas in Luzon and Visayas islands are made up of reproduction brush and young growth. Mangrove destruction not only affects the capture fisheries, but put also at stake the sustainability of the mangrove products, such as high-grade charcoal, tannins, resins and medicines.

### 2.2.3 Seagrass Beds / Algal Beds / Other Soft-bottom Communities

Seagrass and algal beds in the coastal areas have very high primary productivity, playing important roles in the marine food chain. The extensive seagrass and algal beds and soft-bottom communities often occur in close proximity to mangroves and coral reefs. Seagrasses, with 16 species recorded, are practically the only submerged flowering plants in the marine environment. Extensive seagrass meadows are often found between coral reefs and the coastal mangroves; they may be also associated with algal beds of *Sargassum* or other seaweeds interspersed in the shallow reef flats. Economically

important fishes, such as some rabbit fishes (siganids), rely completely upon the seagrasses. Rare and endangered species that graze/reside in seagrass beds include green sea turtles, sea cows and seahorses. Major distributions of seagrass beds in the Philippines occur in Bolinao Bay in Luzon, Palawan, Cuyo Islands, the Cebu-Bohol-Siquijor area, Zamboanga, and Davao (Fortes 1995). Seagrasses are traditionally used as fertilizers and raw materials for handicrafts.

Seaweed beds consist of 190 species. They provide feeding and nursery grounds for different types of marine macro and microorganisms, and interact with seagrasses to control ocean wave action. Although some 150 species are considered economically important, only a few are cultivated (particularly *Eucheuma* spp). The Philippines produces about 80% of the total world supply of *Euchema*. There are some 80,000 seaweed farmers with 350,000 dependents that rely on the seaweed industry in the country (Dakay 1992). Seaweeds are extensively utilized for food and pharmaceutical industry. Key threats for both seaweeds and seagrasses include habitat modification through land reclamation, sedimentation, and introduction of waterborne pollutants and destruction of submerged and fringing vegetation.

Soft-bottom communities often occur in close proximity to other coastal habitats, such as seagrass/algal beds, mangroves and coral reefs. Soft-bottom communities made up of sand or muddy substrates occur in many shallow sub-tidal areas. Marine organisms that inhabit soft-bottom areas include bivalves, heart urchins, various species of worms, sand dollars, some sea cucumber, and shrimps. Such soft-bottom communities are often used for trawling of different fisheries and marine species.

## 2.2.4 Lakes, Rivers and Inland Water Resources

Inland water resources cover about 250,000 ha. These consist of: lakes - 200,000 ha; rivers - 31,000 ha; and, reservoirs - 19,000 ha. The most extensive lakes are found in mainland Luzon (Table 2.2.4.a). Foremost is Laguna de Bay (Laguna Lake), which is the largest lake in the Philippines and the second largest freshwater lake in Southeast Asia. It cuts across 5 provinces, 66 municipalities and 9 cities, including parts of Metropolitan Manila. Laguna Lake provides the bulk of cultured fish, particularly milkfish (*Chanos chanos*) and tilapia (*Tilapia nilotica*). Lake Lanao and Taal Lake are sources of both indigenous and cultured freshwater species. The principal rivers that are significant for freshwater fisheries include Rio Grande de Cagayan, Agno, Abra, Bicol, Pampanga, and Agusan. There are about 106,328 ha of freshwater swamplands.

Table 2.2.4.a Ten Major Lakes of the Philippines

Name of Lakes	Location	Area (ha)
1. Laguna de Bay	Laguna and Rizal	90,000
2. Lake Lanao	Lanao del Sur	34,700
3. Taal Lake	Batangas	23,400
4. Lake Mainit	Surigao del Norte; Agusan del Norte	14,000
5. Naujan Lake	Oriental Mindoro	10,900
6. Lake Buluan	Maguindanao; Sultan Kudarat	6,500

Name of Lakes	Location	Area (ha)
7. Lake Bato	Camarines Sur	3,800
8. Lake Buhi	Camarines Sur	1,800
9. Lake Dapao	Lanao del Sur	1,000
10. Lake Sebu	South Cotabato	964
<b>TOTAL</b>		<b>187,064</b>

### 2.3 Socio-Economic Setting

The total number of people residing in coastal areas was about 39 million in 2000 and 43 million in 2005 (**Table 2.3.a**). Projections of the population from 2000 up to 2020 using low, medium and high population growth assumptions show that coastal population will range from 39 million to 55 million in 2020. The country has a high annual rate of population growth of 2.32%. In coastal provinces, the annual rate of population growth is 2.26%. As to population density in coastal areas, there were 227 persons per square kilometer in 1990. This figure increased to 286 persons per square kilometer in 2000. The comparable figures in non-coastal areas were 182 and 229 persons per square kilometer, in 1990 and 2000, respectively.

Increasing population is a serious problem because of the implications of the limited natural resource base. Rapid population growth aggravates the over-exploitation of the coastal and marine resources. Rapid population growth and imbalances in spatial distribution will continue if population is unabated. In addition, coastal areas are affected by migration as people move to the coasts. In many coastal areas, the population has grown due to the arrival of people from non-coastal areas including indigenous groups seeking an alternative livelihood. For example, indigenous people (Badjaos) have migrated to coastal municipalities in Bohol. As migrant fishermen, they have added to the pressure/exploitation of fishery resources in the area. In Palawan, the historical social processes, which help maintain reasonable patterns of environmental use along coastlines, were overwhelmed by the sudden and unanticipated population growth due to migration (McNally, 2002). In both cases, migrants brought in new resource extraction techniques which were more efficient than those previously employed by non-migrants but also more destructive.

**Table 2.3.a. Population density of coastal areas.**

Parameter	2000	2005	2010	2015	2020
<b>Population (Persons)</b>					
National	76,498,735	84,299,000	92,736,000	100,571,000	108,210,000
Coastal Areas	39,007,905	42,992,490	47,295,360	51,291,210	55,187,100
Non-Coastal Areas	37,490,830	41,306,510	45,440,640	49,279,790	53,022,900
<b>Land Area (km<sup>2</sup>)</b>					
National	300,000	300,000	300,000	300,000	300,000
Coastal Areas	136,400	136,400	136,400	136,400	136,400

Parameter	2000	2005	2010	2015	2020
Non-Coastal Areas	163,600	163,600	163,600	163,600	163,600
<b>Population Density (Person per km<sup>2</sup>)</b>					
National	255	281	309	335	361
Coastal Areas	286	315	347	376	405
Non-Coastal Areas	229	252	278	301	324

Source: Arcdev, 2004.

In 1989, the national literacy rate was 90%, rising to 94% in 1994. These household heads were also found to have lower levels of education than heads of households in general, most being educated to elementary school level. The majority (78%) of coastal household heads have not completed elementary school. Because of economic necessity, youths leave school before completing fourth grade. Only 30% of the students who start first grade ever enter high school. To compound the situation, these households were found to have lower rates of access to basic needs (such as safe water, toilets and electricity) in their makeshift houses or squats. Quality of living conditions is measured in terms of access to basic services such as safe drinking water, sanitary toilet facilities, electricity and housing. In 2000, 65.8 % of coastal households had access to safe water, 55.5 % had electricity, 54.2 % had sanitary facilities, 6 % were living in unplanned settlements with 2.7 % having inadequate shelter (**Figure 2.3.a**). In 1997, on the average, about 38 % of coastal families have access to health facilities with only 30 % of barangays providing health service stations.

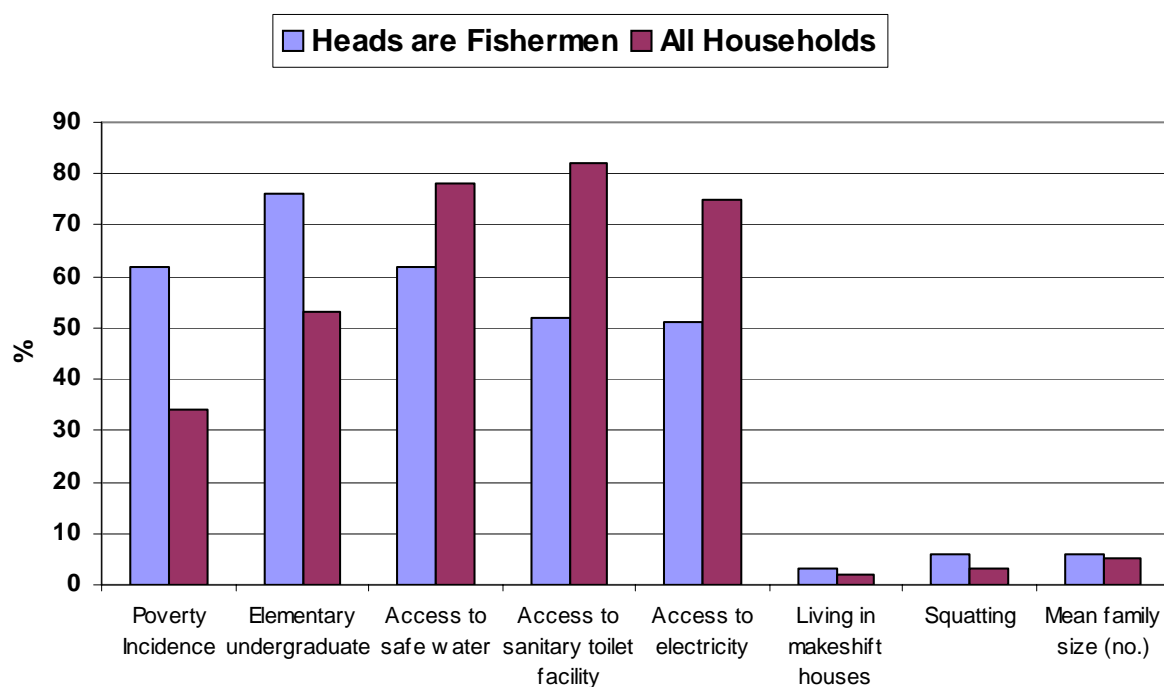
In terms of the size of households, the households of fisherfolks were larger than the national average with a greater portion of their income being spent on food. The majority of Filipinos make a living from fishing in coastal areas. In more urban centers, people work in the 'service and tourist economy', meaning that they work in hotels, shops and restaurants. The fishing industry provides employment to 1.136 million or 5 % of the country's labor force (**Figure 2.3.b**) (NSCB, 2003). Of these, 68 % (675,677) were in municipal fisheries, 26 % (258,480) were fish farmers engaged in different culture methods, and 6 % (56,715) were in commercial fisheries (BFAR, 2003). In addition, approximately 12 % of the general population derives their livelihood from fisheries-related activities.

The proportion of employed persons in the agriculture sector to the total employed was estimated at 35.4 %. Those engaged in the fishery sector was recorded at 4.4 %. Those employed in the services sector registered a share of 48.6 % in January 2004, accounting for about 15.3 million. In the industry sector, its share to total employed was recorded at about 5.0 million in January 2004. Occupation-wise, the laborers and unskilled workers registered a percentage of 31.3 %, followed by the farmers, forestry workers and fishermen at 18.6 %. In 1997, total employment<sup>1</sup> in fisheries firms with more than ten workers was 25,762, composed of 23,859 males (93%) and 1,903 females (7%). For fisheries firms with less than ten workers, total employment was 1,936 persons with 87 %

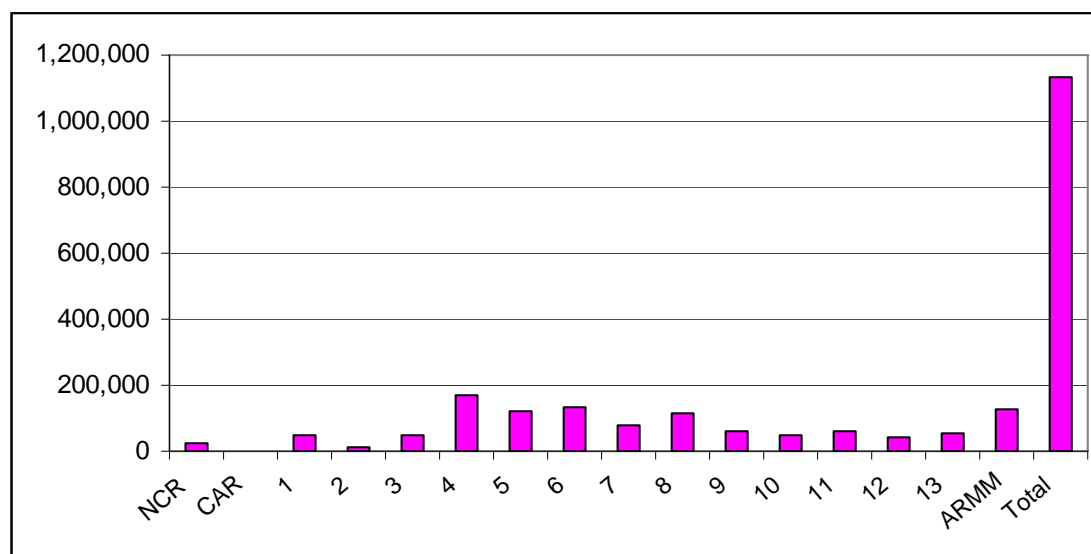
<sup>1</sup> Total employment for the fisheries sector and the transportation, storage and communication sector are obtained from Arcdev (2004) report.

males and 13 % females. For the entire transport, communication and storage sector, total employment in firms with more than ten workers was 193,138 persons composed of 77 % males and 23 % females. For firms with less than ten workers, total employment was 27,470 persons with 71 % males and 29 % females.

Mean annual income for households whose heads are fishermen and all households is PhP 70,244 and PhP 144,039, respectively. The coastal families are, in general, poor, and generally fall below the poverty threshold. Highest monthly income of husbands is PhP 9,000 with a mean value of PhP 2,631. Variations in monthly incomes are due to any of the following: the frequency of fishing; type of fishing vessels used; ownership of fishing vessels; hours spent in fishing and fishing-related activities; engaging in non-fishing economic activities such as poultry and livestock-raising; having multiple employment; rentals of family-owned properties; or in some cases, being hired in the formal sector, whether on a regular or contractual basis (Siason, 2004).



**Figure 2.3.a. Socio-economic characteristics of fishermen.**



Source: NSCB, 2003.

**Figure 2.3.b. Estimated employment generated by fishing industry, 2000 (number of individuals).**

As for the incidence of poverty, in terms of the number of families who fall below the annual per capita poverty threshold, there were 4.7 million families in this category in the country in 1991, and 5.1 million families in 2000. In 1996, 80% of coastal households were rated as falling below the poverty threshold. A survey in 2000 revealed that fisherfolk households had a higher poverty incidence than households in general, with a lower average annual income of PhP70,000, as compared with PhP144,000 for households in general. Furthermore, 40% of the coastal communities were classified as fifth-class municipalities.

Poverty incidence in the country, which refers to the proportion of families with per capita income below the poverty threshold, was 28.4 % in 2000. Poverty estimates released by the NSCB also show that in 2000, 4.3 million families or 26.5 million Filipinos, more than one-third (34.0 %) of the country's population, were living below the poverty line. The annual per capita poverty threshold<sup>2</sup>, or the amount required to satisfy food and non-food basic needs at the national level, reached PhP11,605 in 2000. For the coastal provinces, the annual per capita poverty threshold is PhP 11,382 affecting 26.8 million Filipinos or 82 % of the country's population already below the poverty threshold.

## 2.4 Fisheries Sector Economic Performance

The fisheries sector<sup>3</sup> comprises of municipal fishing, commercial fishing and aquaculture. The fish industry accounted for 15.2 % (PhP 90.2 billion) and 20.3 % (PhP 41.8 billion) of

<sup>2</sup> The poverty threshold is the annual per capita income required or the amount to be spent to satisfy nutritional requirements (2,000 Kcal) and other basic needs (TWG on Income Statistics, NSCB).

<sup>3</sup> *Municipal fishing* is the sector of fisheries that includes catching of fish in marine and inland waters with the use of fishing boat of three gross tons or less, using gear not requiring the use of boats. *Commercial fishing* includes the catching of fish in marine waters with the use of fishing boat of more than three gross tons and beyond the fifteen kilometers shoreline limit. *Aquaculture* or the sector of fisheries that includes

the Gross Value Added (GVA) in agriculture, fishery and forestry group of PhP 592.1 billion and PhP 206.2 billion at current and constant prices, respectively (**Table 2.4a**). The average annual increase of GVA from 1988-2002 is 7 % and 3 % at current prices and constant prices, respectively (Figure 2.4a). The fishing industry's contribution to the Philippine's Gross Domestic Product (GDP) of PhP 4,023 billion at current prices is 2.2 % or PhP 90.2 billion (**Figure 2.3.a**). At constant prices, the fishing industry's contribution to GDP of PhP1,046 billion is 4 % or PhP 41.8 billion (**Figure 2.3.b**).

The Philippines exports 135,518 mt of live and prepared/preserved fish, crustaceans, and mollusks valued at PhP 21.3 billion (**Figure 2.4.c**). The top three fishery exports are tuna, shrimp and seaweeds with export values of PhP 7.5 billion, PhP 7.3 billion and PhP 3.7 billion, respectively. Major destinations of the Philippine fish and fishery products are Japan (25%), USA (21%), Hongkong (8%), Taiwan (7%), and Korea (6%) (**Figure 2.4.d**). Imports of fishery products exceeded exports in volume from 1987 to 1997, which resulted to trade deficits (**Figure 2.4.e**). For the same period, the value of exports exceeded that of imports resulting in trade surpluses (**Figure 2.4.f**). The foreign trade performance of the fishery sector for 2002 recorded a trade surplus of PhP21.1 billion with total fishery exports amounting to PhP 26.1 billion and fishery imports amounting to PhP 5 billion.

Based on the per capita requirement of 36 kg of fish per year, the annual fish catch allowed each Filipino to consume only about 26-27 kg of fish for an average of 15 % shortfall or deficit in fish supply (**Figure 2.4.g**). The exclusive economic zone (EEZ) has not been exploited to the fullest and remains underutilized by local fishermen. Because of constraints in capital investment many commercial fishing boats fall within the small and medium category and are not suitable for fishing in far-flung areas. High post-harvest losses is a problem in fisheries. It was estimated that post-harvest losses range from 20 - 40 % of total output. The identified causes are improper handling and processing practices, and poor harvest facilities.

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the rearing or raising under controlled conditions of aquatic products such as fish, oysters, mussels, sea weeds and other aquatic resources in sea, lakes and rivers. Examples are fishponds, fish pens and fish cages. (Bureau of Agricultural Statistics).

**Table 2.4.a. Gross Value Added in Agriculture, Fishery, and Forestry Sectors**

Year	Gross Value Added							
	Current Prices (million pesos)				Constant 1985 Prices (million pesos)			
	Agriculture	Fishery	Forestry	Total	Agriculture	Fishery	Forestry	Total
1988	135,751	34,708	13,056	183,515	115,447	28,581	11,264	155,292
1989	162,408	36,460	11,141	210,009	121,066	29,628	9,270	159,964
1990	186,216	40,833	8,907	235,956	122,631	30,783	7,320	160,734
1991	208,051	47,276	6,541	261,868	126,204	32,001	4,732	162,937
1992	236,526	51,633	6,763	294,922	127,010	32,375	4,186	163,571
1993	255,443	57,533	5,570	318,546	130,736	32,820	3,497	167,053
1994	301,877	65,860	4,770	372,507	135,224	33,195	2,971	171,390
1995	342,726	65,338	4,133	412,197	136,616	34,453	1,779	172,848
1996	377,744	65,394	4,665	447,803	143,265	34,288	1,898	179,451
1997	386,896	67,848	3,239	457,983	149,429	34,247	1,328	185,004
1998	380,537	67,820	3,288	451,645	137,331	34,498	1,372	173,201
1999	433,748	72,690	4,056	510,494	147,604	35,156	1,704	184,464
2000	447,035	78,450	3,383	528,868	153,996	37,089	1,372	192,457
2001	461,479	84,856	2,404	548,739	159,322	39,248	998	199,568
2002	501,158	90,180	803	592,141	164,091	41,772	335	206,198

Source: NSCB (2003).

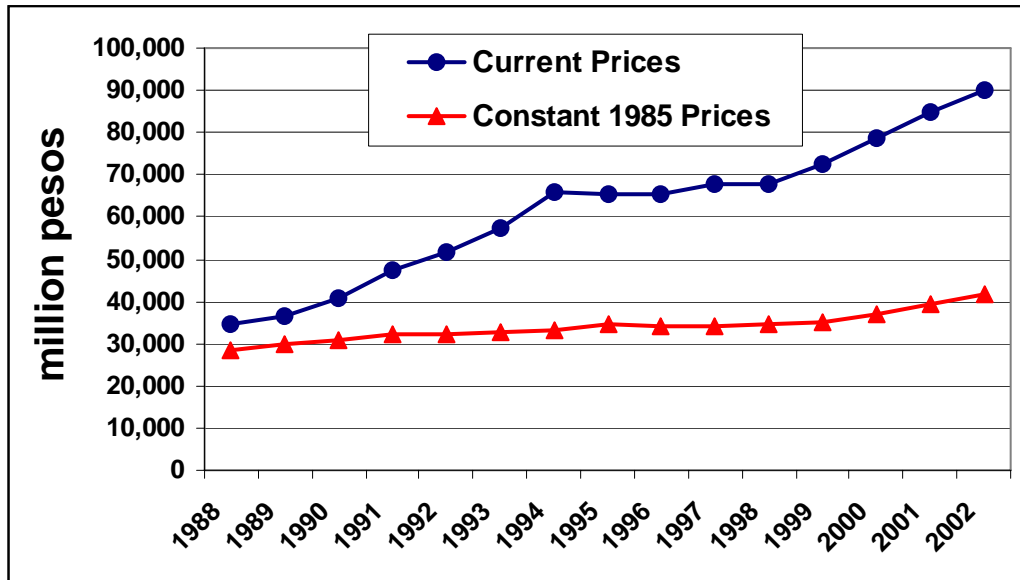


Figure 2.4.a. Gross Value Added for Fishery Sector

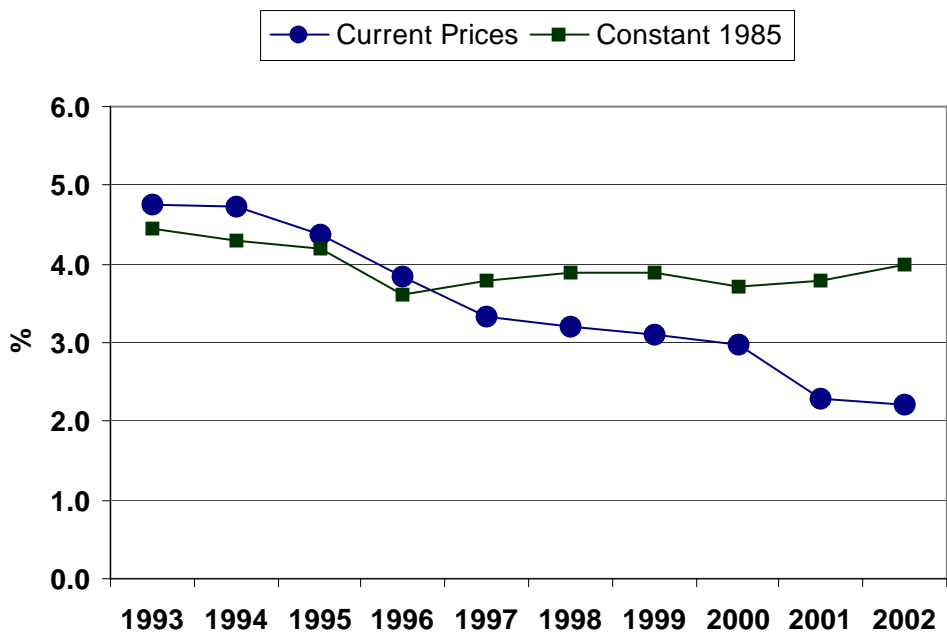


Figure 2.4.b. Contribution of Fisheries to GDP

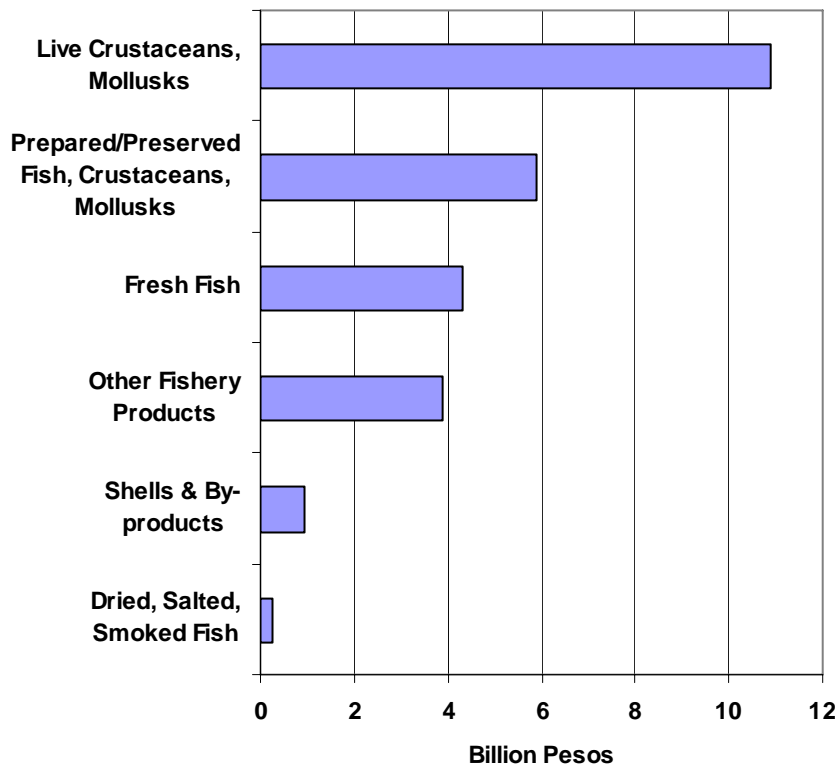


Figure 2.4.c. Value of Major Fishery Exports, 2002

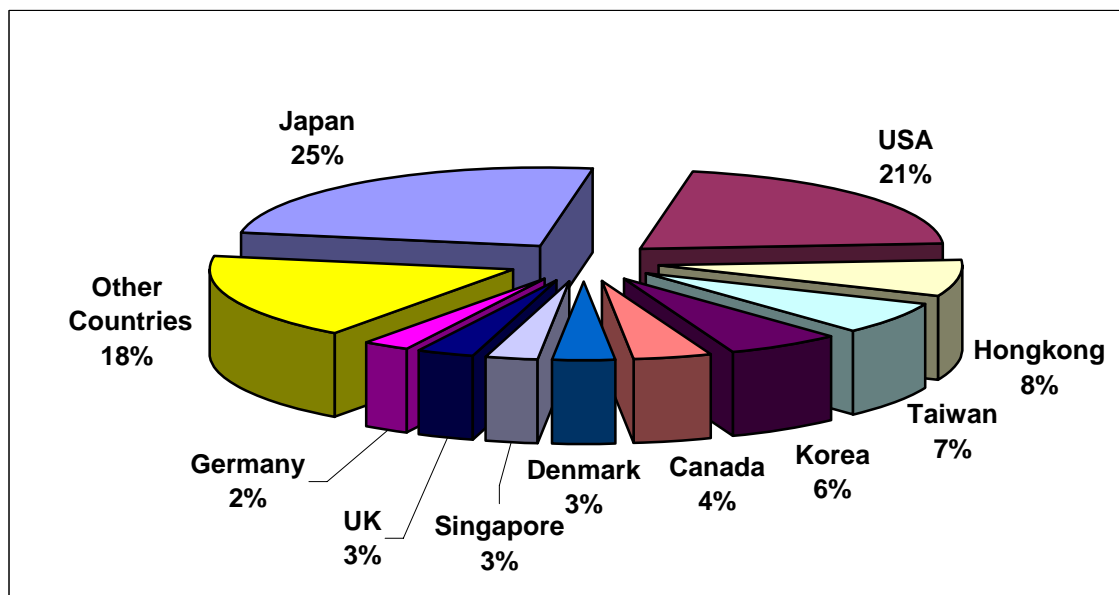


Figure 2.4.d. Country of Destination of Fishery Exports, 2002

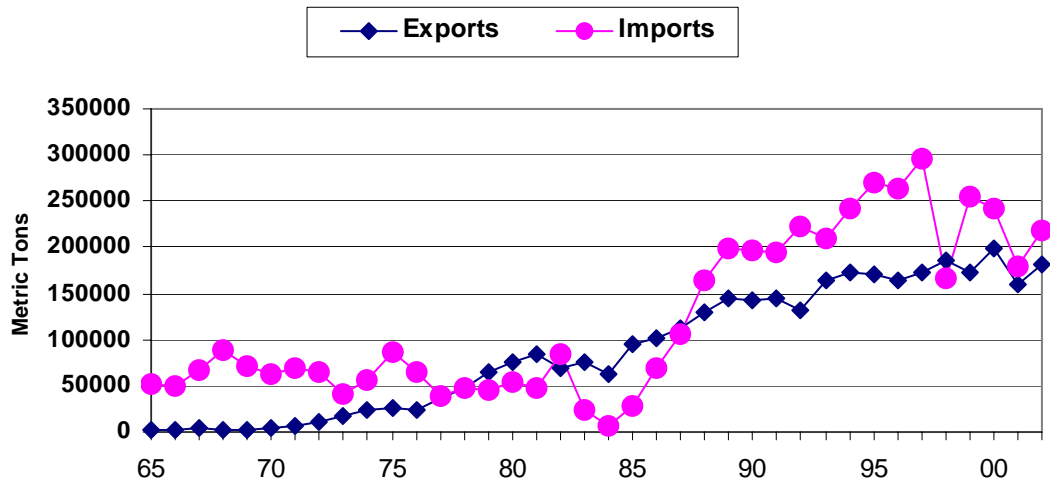


Figure 2.4.e. Volume of Fishery Exports and Imports

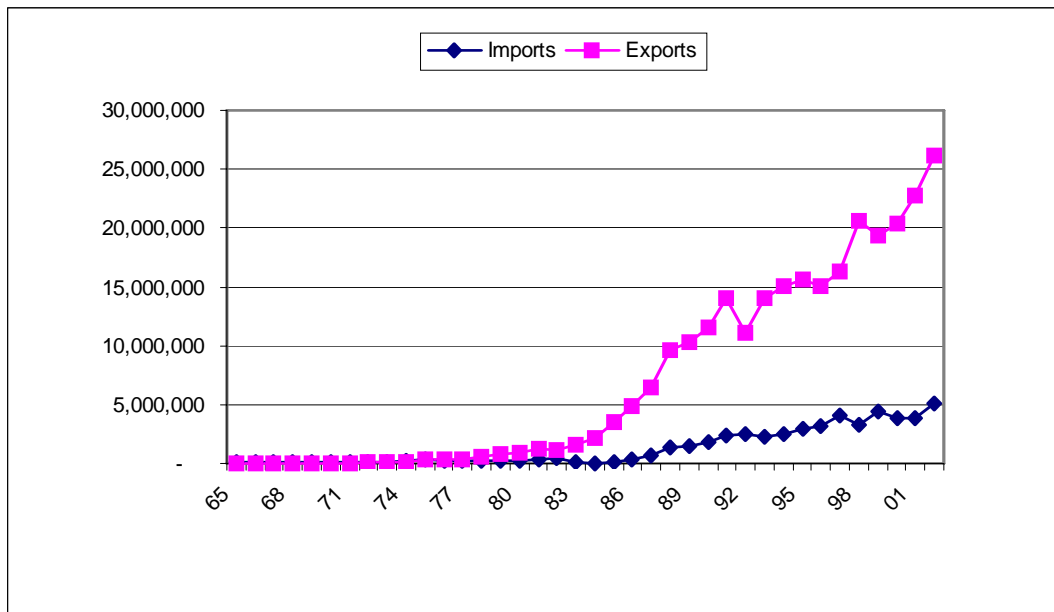
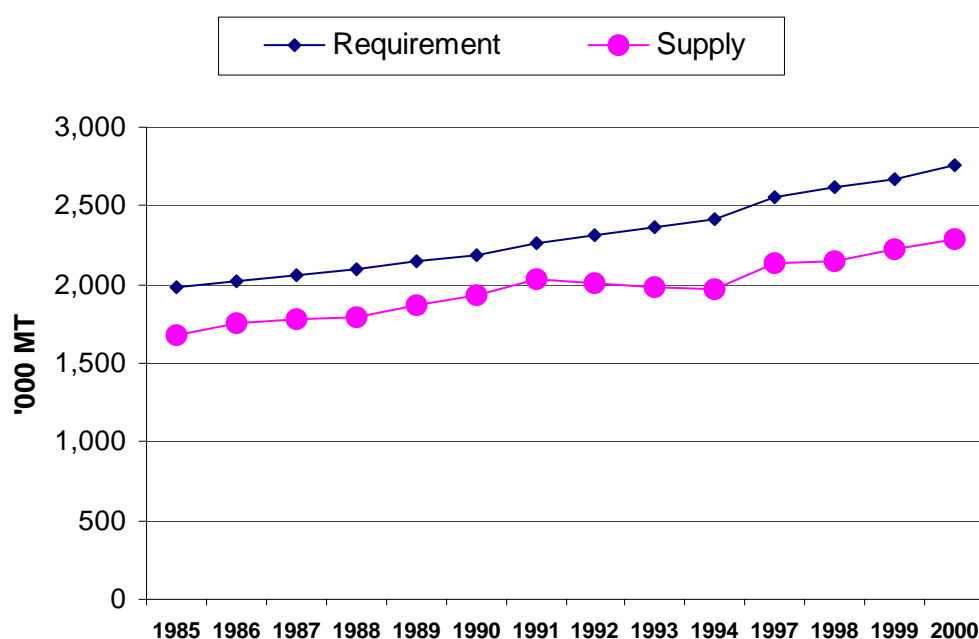


Figure 2.4.f. Value of Fishery Exports and Imports



\*Requirement based on 36 kg annual per capita fish consumption.

Figure 2.4.g. Fish Requirement and Supply

## 2.5 Fisheries Sub-Sector Status and Trends (Commercial, Municipal, Aquaculture, Post Harvest)

### 2.5.1 Resource Users

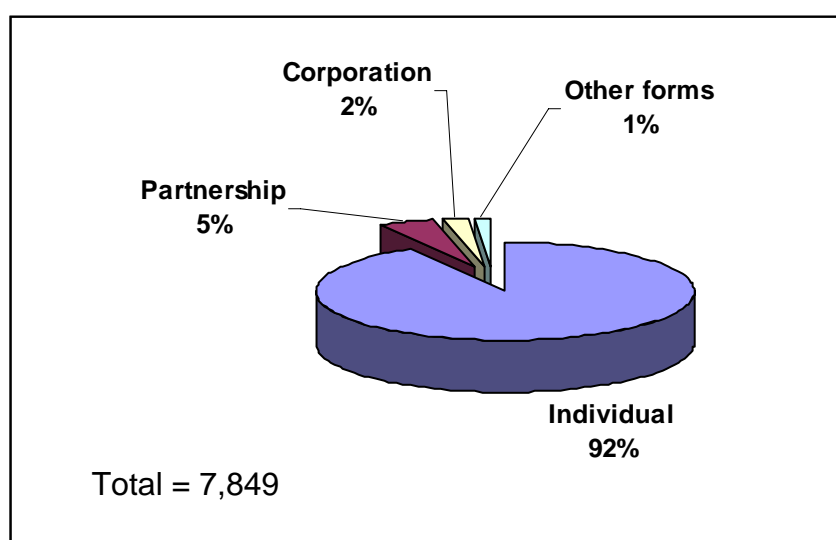
In 1994, there were about 733,000 fishers in the Philippines (Silvestre and Pauly 2004). As of 1996, it was estimated that the country had about a million fishers and fish farmers (Israel and Roque 1999). BFAR-FPED (2003) reported a total of 990,872 individuals employed by the fisheries sector. Of this total number, 26.1 % are in aquaculture, 68.2 % in municipal fisheries, and 5.7 % are in commercial fisheries

Users and producers of marine resources in the commercial fisheries subsector include the commercial fishers, fishing operators, fishing companies, and fishing associations. They can be vital partners of the government in fishery management, especially in data collection, monitoring and surveillance. Commercial fishers, for instance, are aware of the presence of illegal fishers and foreign poachers and can be tapped for surveillance purposes. Commercial fishing operators, with their data gathering system which enables them to monitor and identify the best fishing grounds at anytime of the year, can provide the government with excellent data for fishery management.

According to the NSO 2004 press release on the Philippines' fishery sector after two decades, the number of fishing operators engaged in commercial fishing ballooned from 2.1 thousand in 1980 to 16.5 thousand in 2002. However, based on the same data source (*i.e.*, NSO 1980 Census of Agriculture and Fisheries and 2002 Census of Fisheries), a

2002 NSO report indicated that there were only 7.8 thousand commercial fishing operators in 2002. Of this number, individual proprietorship comprised a total of 7.2 thousand (91.6 %); partnership, 4.7 %; and corporation, 2.3 % (Figure 2.5.1.a). The rest of the commercial fishing operators (1.6 %) were either registered under other legal forms of organization or not reported.

Out of a total of 7.3 thousand commercial fishing operators, 98.6 % were males. The median age of male commercial fishing operators was 39 years; the female operators were older at 49 years. Household members of commercial fishing operators who were engaged in fishing operations totaled 4.95 thousand persons. Among them, 4.2 thousand (84.8 %) worked in their own fishing operation, 519 (10.5 %) in other fishing operation, and only 233 (4.7 %) in both. There were more male non-operator household members (3.2 thousand) engaged in fishing than females (1.6 thousand) (NSO 2002).



**Figure 2.5.1.a Commercial fishing operators by legal form of organization, 2002. (NSO 2002).**

The Philippines has at least 11 commercial fishing associations with nationwide membership of at least 173 fishing companies/individuals. These associations are in league, under the Federation of Fishing Associations of the Philippines, for the maintenance or promotion of common interests in the fishing industry, or for mutual assistance or service.

## 2.5.2 Production Schemes/Technology

Commercial fishing boats/vessels are of three types: small-scale, medium-scale, and large-scale boats. Small-scale boats are more than 3 GT with outriggers, the motors of which are generally second-hand diesel engines imported from Japan and converted into marine use. The medium-scale type includes liftnet boats (*basnig*), large Danish seiners (*super hulbot*), medium trawlers and old monohulls fitted with outriggers. There are also monohulls (wooden and steel) engaged in ring net or baby purse seine operations. A growing number of medium-scale commercial boats are equipped with modern communications and fish-finding equipment; it is not uncommon to find global positioning system-equipped fish finders and sonars on board ring netters. *Large-scale* commercial

boats are made of steel and bought second-hand from Japan, U.S.A. and Taiwan, although a few are constructed locally. These are mainly engaged in purse seining, with most catchers going for tuna or seasonal pelagic fishes such as mackerels and round scads. Large commercial vessels fish all over the archipelago; their landings at the Navotas Fish Port may come from Celebes Sea, Sulu Sea or other areas of the country (Aguilar 2004).

The total number of commercial fishing boats/vessels operating in the Philippines is 3,601 with a gross tonnage totaling to about 270,281. The National Capital Region is credited with the most number of commercial fishing vessels, accounting for 37.5 % of the country's commercial fishing fleet, followed by Region XI (15.4 %), Region VI (11.2 %), and Region IX (10.9 %); the rest of the regions have less than 10 %. Fishing boats with gross tonnage of 5.1-9.0 comprised 20.4 %; 9.1-19 GT, 13.1 %; 19.1-49 GT, 13.7 %; 49.1-99 GT, 5.3 %; 99.1-499 GT, 4.7 %; those more than 499 GT, 1.6 %; while those with unreported boat size comprised 2.3 % of the total number of commercial fishing vessels counted.

Boats commonly used for fishing operations in the country are the handliner, Danish seiner, bag netter, trawler, ring netter, purse seiner and carrier, with overall length ranging from 3 m to 50 m, and a gross tonnage of 3 GT to 300 GT (Table 2.5.2.a). Some medium and most large commercial fishing boats are monohulls, built of steel, and usually acquired secondhand directly from abroad or converted from other craft types (Aguilar 2004).

**Table 2.5.2.a Dimensions of commercial fishing boats (Source: Aguilar, 2004)**

Type	Overall length (m)	Gross Tonnage
Handliner	3 - 5	3 - 10
Danish seiner ( <i>hulbotan</i> )	10 - 25	4 - 30
Bag netter ( <i>basnigan</i> )	15 - 27	5 - 20
Trawler	11 - 22	6 - 20
Ring netter	12 - 25	15 - 50
Purse seiner	20 - 50	40 - 300
Carrier	12 - 50	10 - 250

The number of fishing boats/vessels with engine, used by commercial fishing operators, increased by 202.8 % over the past two decades, from 3,232 in 1980 to 9,791 in 2002. Majority of the fishing boats/vessels (29.1 % of the total number) had an engine capacity of less than 50 hp, of which 2,363 had outriggers. Fishing boats/vessels with engine capacity of 75 - <100 hp comprised 20 %; those with 200 hp and over, 13.4 %; and each of the other categories, less than 10 % of the total number of boats with engine (Figure 2.5.2.a).

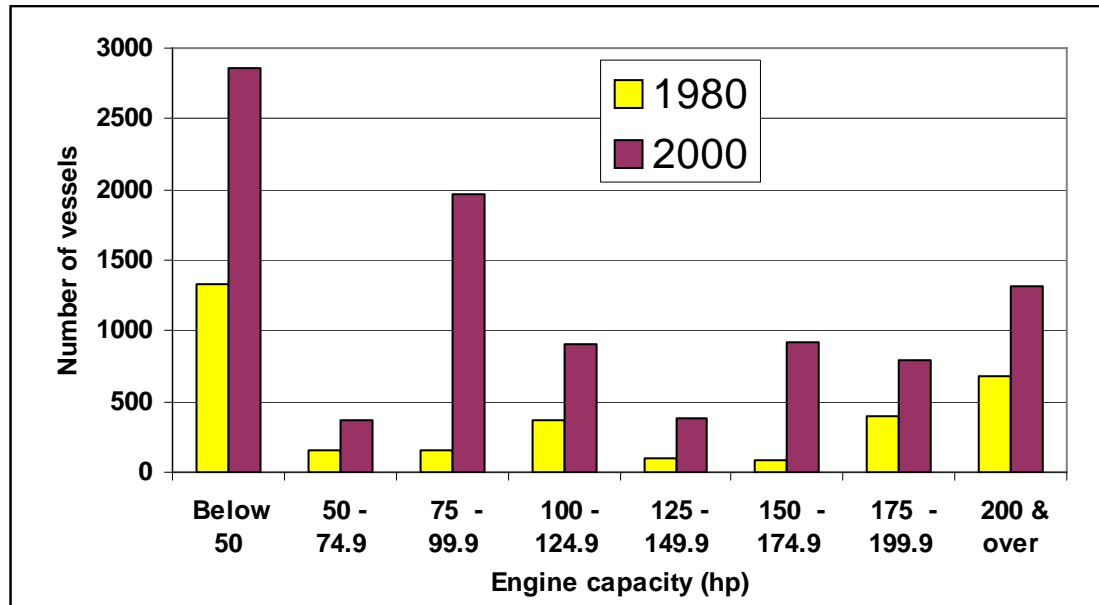


Figure 2.5.2.a Engine capacity of commercial fishing vessels (Source: NSO, 2002)

There are 14 types of fishing gear being used by the commercial fisheries sector in the Philippines, *viz.*, purse seine, ring net, trawl, Danish seine, bag net, hook and line, push net, gill net, troll line, beach seine, longline, drift filter net, round haul seine, and drive-in net (Munprasit *et al.* 1995). Of these, Barut (1996) mentioned purse seine, ring net, hook and line, and bag net as the most frequently used gear in commercial fisheries; other types of gear used are Danish seine, gill net, troll line, round haul seine, and trawl. Purse seine and ring net operations are almost always in conjunction with a fish-aggregating device (FAD) locally called *payaw*.

NSO record as of August 2003 disclosed a total of 146.2 thousand fishing gear units used by commercial fishing operators. The hook and line group of fishing gear, which includes the longline, handline and troll line (Munprasit *et al.* 1995), accounted for 40.7 %; the group of other types of commercial fishing gear (*e.g.*, Danish seine, drift filter net), 37.5 %; gill net, 16.8 %; purse seine and ring net, 2.2 % (Figure 2.5.2.b).

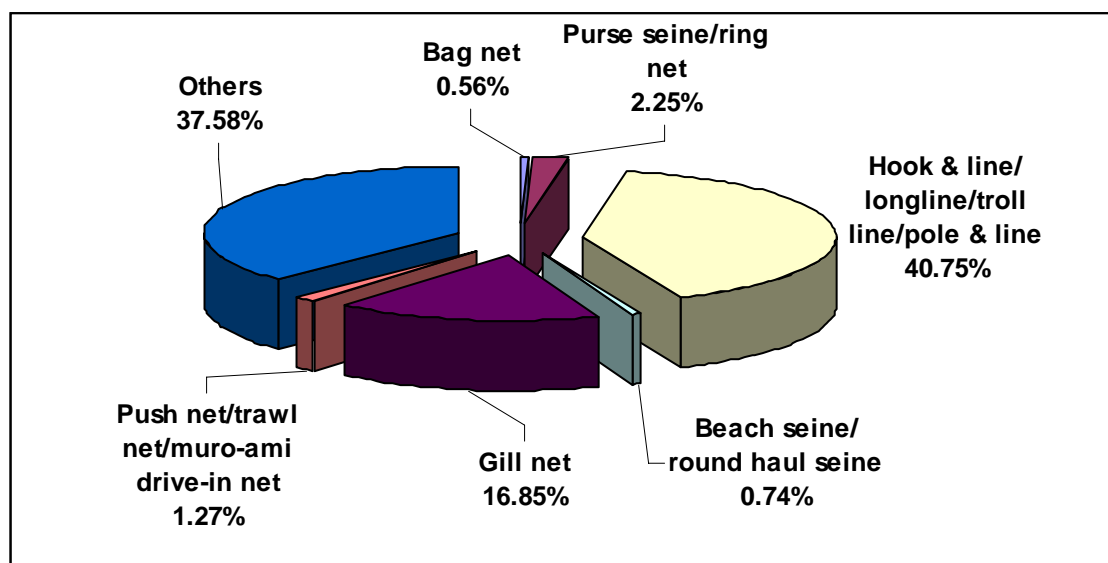


Figure 2.5.2.b Commercial fishing gears (Source: NSO, 2003).

To date, the following species are being farmed in the Philippines: milkfish, penaeid shrimps, tilapia, seaweed, groupers, catfish, mudfish and common carp, seabass, rabbitfish, ornamental aquarium fish, oysters and mussels, mud crabs, freshwater prawn (*Macrobrachium*), abalones and spiny lobsters. Also, existing are pilot or small-scale hatchery/nursery operations for other commercially important marine products, such as rock lobster, spiny lobster, sea cucumber, sea urchins and abalone. Recently, the establishment of mariculture parks as a farm setup has been promoted by institutions like the SEAFDEC Aquaculture Department and the BFAR. In the Philippines, such a mariculture park already has a legal framework. The Fisheries Code of 1998 requires that aquaculture areas be designated by local governments in case of municipal waters or by the Department of Agriculture for waters located outside municipal waters. Furthermore the appropriate government unit is also required to regulate the stocking density and feeding based on the carrying capacity of an area.

### 2.5.3 Production Levels/Trends

In 2004 volume of fish unloaded by municipal fishing boats reached 244,348 metric tons, higher by 10,297 metric tons from the 234,051 metric tons posted in the same period last year. Both marine and inland fisheries indicated positive growth rates of 4.80 % and 2.25 %, respectively. Volume of fish landed by marine fishermen rose by 9,465 metric tons, from 197,006 metric tons of the same period last year to 206,471 metric tons this year. Similarly, catch from inland fishing increased by 832 metric tons, from 37,045 metric tons in the same quarter last year to 37,877 metric tons this year. Marine and inland sub-sectors performed well in spite of the occurrence of typhoons in most parts of the country during the quarter.

Fisheries production increased from 2.72 million tons valued at PhP 80.2 billion in 1994 to 3.7 million tons at PhP119.9 billion in 2003. Of the total fish production in 2003, the

commercial fisheries subsector contributed 30.7% (1,109,636 MT); municipal fisheries, 29.1% (1,055,143 MT); and aquaculture, 40.2% (1,454,503 MT) (BFAR-FPED 2003).

The first four regions that contributed most to the commercial fish production in 2003 were Region IX (19.1 %), Region XII (16.1 %), NCR (13.8 %), and Region VI (10.9 %) (Table 13). The rest of the regions produced less than 100 thousand tons. In all the regions, commercial catches are usually landed at traditional landing centers. The top contributors for the country's commercial fisheries production are Navotas Fish Port (which remains as the country's major fish landing center, contributing 23 % to the total landings), Zamboanga City (12 %), and Quezon (8 %) (BAS 1997).

The target species of most commercial fishing operations are tunas and tuna-like fishes due to their significant demand in the international market and the growing demand of the domestic canning factories. Frigate tuna and skipjack each accounted for 10.3 % of the total volume of commercial fish produced in 2003, while yellowfin contributed 7.9 %. Other species of small pelagic fishes such as the round scads (22.9 %), Indian sardines (11.7 %), big-eyed scads and other species also significantly contribute to commercial fisheries production (Table 2.5.3.a).

**Table 2.5.3.a. Commercial fish production by major species (Source: BFAR-FPED, 2003).**

Major Species	Total Volume	% to Total Volume
Round scad ( <i>galunggong</i> )	254,659	22.9
Indian sardine ( <i>tamban</i> )	130,024	11.7
Frigate tuna ( <i>tulingan</i> )	114,760	10.3
Skipjack ( <i>gulyasan</i> )	114,077	10.3
Yellowfin tuna ( <i>tambakol</i> )	87,473	7.9
Big-eyed scad ( <i>matangbaka</i> )	39,621	3.6
Fimbriated sardine ( <i>tunsoy</i> )	36,358	3.3
Slipmouth ( <i>sapsap</i> )	36,313	3.3
Indian mackerel ( <i>alumahan</i> )	32,037	2.9
Anchovy ( <i>dilis</i> )	28,654	2.6
Other species	235,660	21.2
TOTAL	1,109,636	100.0

Data on the country's marine capture fisheries, from 1970 to 1994, show that the catch of demersals has leveled off since 1976; whereas that of small pelagics was almost the same from 1976 to 1988, increasing rapidly from 1988 to 1992, then declining from 1992 to 1994. These catch trends, in the face of continuously increasing fishing effort, reflect assessments indicating overfishing of demersal and small pelagic stocks (Barut *et al.* 2004).

Aquaculture production in 1994 was 869,083 mt, over half of it came from seaweed production. In 1995, the subsector produced about 940,589 mt, making it the only subsector with a steady production growth compared to municipal and commercial fisheries sub-sectors. Aquaculture production was up to 1,220,500 mt in 2001, 1,338,400 mt in 2002, 1,454,500 mt in 2003 and 1,713,451 mt in 2004. Production from brackishwater fishponds in 2003 was close to 245,000 mt, with milkfish as the major

commodity while fish cage and pen productions were 5,362 mt and 4,382 mt, respectively. In the same year, a total production of 71,970 mt was reported for freshwater fishponds, 52,832 mt for freshwater cages and about 35,875 mt for freshwater pens. Production in marine waters include those from marine fish cages and mariculture activities (basically seafarming of oysters, mussels and seaweeds, In 2003, production from marine fish cages was 12,120 mt, while mariculture yielded 1,016,888 mt., 988,999 mt (over 97%) came from seaweed production.

About 91% of the total fishpond area in the Philippines, including those used for freshwater aquaculture, are brackishwater ponds. In 2003, production in brackishwater fishponds (mainly of milkfish and shrimps) accounted for 58.8% of total aquaculture volume (excluding seaweeds, oysters, and mussels) (FAB, 2005). In 2003, milkfish represented 79% of the volume produced in brackishwater ponds. Shrimps (primarily black tiger) contributed about 50% of the total production value as compared to 42% for milkfish. From 1993-2003, the average value contributed by black tiger and milkfish was 58.7% and 36.0%, respectively (FAOSTAT, 2003; FAB, 2005). Aquaculture production of major species is presented in Table 2.5.3.b.

**Table 2.5.3.b. Major species farmed, 2003 (Source: BFAR, 2003).**

Species	Quantity (MT)	Percent (%)
Seaweeds	988,888	68.0
Milkfish (Bangus)	246,505	16.9
Tilapia (cichlid)	135,996	9.3
Shrimps / Prawns	37,032	2.5
Others	46,083	3.2
<b>Total</b>	<b>1,454,503</b>	<b>100.0</b>

## 2.5.4 Markets

In the domestic market, fish are traditionally sold both in the retail and wholesale trading centers. Majority of the catch from *the municipal fisheries sub-sector* is marketed, mostly in retail quantities, directly in the traditional landing sites. There are also middlemen who would buy the fish from the fisherfolk and either sell these fish in the local wet market or process them into dried, smoked or fermented products. In some areas, the catch of the municipal fisherfolk directly goes to the big entrepreneurs of the area as a payment for the debt that the fisherfolk incur during the lean seasons.

The municipal fishers' fish products are usually marketed locally within a few hours. Larger, high quality fish are sold to wholesalers who ship the fish from the area. Wholesalers sometimes bring the fish to bigger markets in major towns within a province and high value products like mud crab and sea cucumber are brought to city markets like Metro Manila. Mark-ups at each stage of the marketing chain range from a low of 10 to a high of 50 %. Thus, farm-gate prices are generally less than half of the retail prices. Prices at source are not, however, always identical with prices received by the fishermen, especially when the fishermen are hired help and do not own the boats and gear. In such cases, the return to the fisherman is as low as 15 % of the landed price. "Suki" arrangements, a system where the buyer provides capital for fishing for priority in fish landings is common among fishers. Fishers borrow for capital investments and operating

(living) expenses. All lenders except banks require the borrower to sell the fish to the lender. No interest is charged, but loan repayment is made daily in the form of fish produce at reduced price terms.<sup>4</sup>

Smaller fish are sold to village retailers or marketed directly to consumers. Majority of the products of municipal fishers are sold by retailers at the village-level *talipapa* or at the town center's wet market. Frequently, the fish are vended by women in the villages. Marketing costs are low, although 5-10 percent/kilo mark-up exists between sales to retailers and sales to consumers at the village level.

The catch from the *commercial fisheries sub-sector*, on the other hand, is traded in landing sites in wholesale qualities. In some cases, the catch that has been landed in private and traditional landing sites is transported to major fish ports for auctioning. Some fish canneries (*e.g.* Ayala Seafoods Corporation, Universal Canning Corporation, *etc.*) have their own fishing vessels and therefore transport the catch directly to the canning plants.

In the *aquaculture sub-sector*, most of the produce is either auctioned on site or is transported to major fish ports for auctioning. Those who engage in on-site bidding are middlemen and fish exporters, while bidding in fish ports is typically for middlemen, fish vendors in the local wet markets, and small fish processors. Some aquaculture farms have their own processing facilities (*e.g.* Alson's Aquaculture Corporation, Aklan's Boneless Bangus, *etc.*) and as such, most of their aquaculture produce directly goes to their processing plants.

For fishery products in the Philippines, majority of the traditional products in the *postharvest sub-sector* (*e.g.* smoked, dried, salted, fermented and marinated/pickled) are marketed in most of the wet markets all over the country. Some products, such as canned/bottled fish (using sardines, milkfish, mackerel, tuna, *etc.*) and fishery products (*e.g.* pasteurized fish paste, crab fat or *aligi*, *etc.*), deboned milkfish (as plain, marinated or smoked product), and frozen fish (Spanish mackerel or tanguigue, tuna fish, *etc.*), are now in the shelves of large supermarket chains in the Philippines.

In terms of the export market, the Philippines has Japan and the USA as its traditional export markets. Although these countries still remain as the top major destination of Philippine fish and fishery products, it is still necessary to tap other markets and create a niche for some of our fish and fishery products. Since the world market demands high quality, safe and globally competitive products, development of new fishery products or improvement of existing ones may not be the only strategy. Compliance to existing regulations in the export market is imperative, and in order to stay in the competition in the export market, countries, like the Philippines, must deal with both the traditional and technical trade barriers.

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<sup>4</sup> See also Marketing of Fisheries Products by Municipal Fishermen in Panguil Bay, Philippines.  
<http://www.ag.auburn.edu/icaae/pub11.htm>

only strategy. Compliance to existing regulations in the export market is imperative, and in order to stay in the competition in the export market, countries, like the Philippines, must deal with both the traditional and technical trade barriers.

### 2.5.5 Post Harvest

In the Philippines (and elsewhere), the fish processing methodologies that could effectively reduce the rate at which spoilage happens in fish and help produce quality, safe and competitive fish and fishery products typically involve any of the following: (1) temperature control *via* the use of either low temperature (*i.e.* chilling and freezing) or high temperature (*i.e.* thermal processing, boiling, and smoking); (2) reduction of moisture (*i. e.* salting, drying, smoking and fermentation); (3) other processing methodologies (*e.g.* mincing, surimi processing, seaweed processing, marinating/pickling, *etc.*); and (4) combination of different processing methodologies to produce value added fishery products. Overall, approximately 70% of the total fish consumption in the country is in fresh or chilled forms, while the remaining 30% is processed into either cured (*i.e.* salted, dried, smoked, fermented, and pickled), canned or frozen products, or disposed of as live food (Abella and Baltazar 1995).

#### (a) Post Harvest Handling

Proper post harvest handling practices in aquaculture facilities, in commercial and municipal fishing boats/vessels, in major and municipal fish ports and other landing sites, and in fish processing establishments are prerequisites to maintaining fish quality. In particular, contributory to the lowering of fish quality is the limited access of fish handlers to refrigeration facilities in fishing boats/vessels and in landing sites. *For the commercial fisheries sub-sector*, most of the fishers have to rely on private ice plants/ice making facilities. Although the government provides refrigeration facilities in major fish ports and some municipal fish ports, most of these facilities are non-operational. For instance, only 26% of both government-owned ice plants and ice storage facilities remained operational in 2004. *For the municipal fishers*, the problem is exacerbated by their inability to buy ice for their catch.

The preservation technique in most of the landing sites in the Philippines is still the reduction of temperature *via* chilling or the use of crushed ice. There are other chilling media available in the Philippines (*e.g.* ice in other forms, such as flaked, tube and blocks, refrigerated / chilled seawater, seawater ice and slushed ice). The choice of the medium to be used depends on their availability and affordability to the three fisheries production sub-sectors, *i.e.* commercial fisheries, municipal fisheries and aquaculture sub-sectors.

In terms of fish containers, there are different types that are being used in the industry, depending on their cost and availability in a particular area. Among the municipal fisherfolk in traditional fish landing sites, relatively cheaper containers, *e.g. banera*, wooden boxes / baskets, *etc.* are widely used. In municipal and regional fish ports, *baneras* are still in demand. However, a good number of traders in these ports and in aquaculture sites presently use styropore boxes. In big fishing vessels, *baneras* and styropore boxes are typically being used. Among the fish exporters, they prefer either styropore boxes or the more sanitary plastic boxes in their processing plants.

*(b) Post Harvest Processing*

Fish processors, more particularly in the coastal communities, generally rely on traditional knowledge in processing fish and other aquatic resources. Products processed are fish species that are caught in large quantities during certain seasons, such as sardines, siganids, mackerel/round scad, and anchovies. All are dried, but round scads are also smoked. Siganids sometimes also undergo de-boning before drying. Besides drying and smoking, anchovies and siganid fry are processed into fish sauce known locally as *ginamos* and *padas*, respectively. More recently, milkfish (*bangus*) has been de-boned and marinated and sold in plastic and styrofoam packs. According to DTI, the big majority of processors in the country are small-scale operators. Indeed, most of those who dry and smoke fish are the wives of municipal fishermen, if not the fishermen themselves. Fish traders also engage in drying and smoking, usually of excess fish.

Data on the number and regional distribution of fish processing establishments (FPE) in the Philippines are very inadequate. In general, only those registered FPE are recorded, majority of which are the big players in the industry. As of 2004, only 294 PHE have LTO from BFAD (BFAR 2005). The other FPE that operate as backyard activities and use traditional fish processing methodologies (*e.g.* salting, drying, smoking, fermentation, etc.) remain uncounted. Although some of these fish processors produce good fishery products, the consistency of the quality of these products is not maintained. In fact, many individuals and small groups in coastal communities all throughout the Philippines conduct their drying, salting, fermentation and other fish processing activities without any permit or license to operate. Since these activities are not properly regulated or regularly inspected by proper authorities, the use of non-standardized processing methodologies becomes a major problem in the industry as far as quality and product consistency are concerned.

The big players in the industry, on the other hand, tend to continuously improve their fishery products to meet the demands and specifications of the export market. Most of these big players have their own processing plants. Only two fish port complexes, namely Camaligan and Iloilo Fish Port Complexes, reportedly provide processing areas to entrepreneurs and only one (*i.e.* the Camaligan Fish Port Complex) has a 66 sq.m. area for laboratory facilities. These results to the exportation of fish and fishery products from the Philippines to major markets in the world, such as the USA, Europe, Japan and other Asian countries. However, some of these fish exporters are not able to sustain compliance to existing quality systems as imposed by the major importing countries. Proofs to this are the rejection/detention cases that are experienced by some Philippine fishery products in the export market. Such inability of the fish processors to sustain compliance to quality systems does not only affect the quality of the product, but also affects the safety of these products

In terms of storage and distribution of the finished product, in the Philippines, the government-owned cold storage facilities are not sufficient to meet the demands of the industry. In fact, only 40% of the freezers and 28% of the cold storage facilities that are government-owned remained operational in 2004. In the distribution of fishery products in the local market, even some of the local supermarket chains do not handle the products well, most especially the frozen products. In terms of packaging of fish and fishery products, traditional packaging of fishery products still prevails in the Philippines, more

particularly in products sold in the wet market. This includes the use of banana leaves, old newspapers, and thin plastic bags for retail packaging of fishery products, and the use of wooden trays and boxes for storage, transport and marketing of fishery products in wholesale quantities. For practical purposes, these are relatively cheap packaging materials for fishery products that are processed in coastal communities. However, in most cases, these products experience problems that are related to quality, safety, sales appeal, and shelf-stability. For fishery products in retail supermarkets, poor packaging and labeling of fishery products in the country still predominates, despite the implementation of the Labeling Act of the Philippines (RA 3740, Commonwealth Act No. 46, as amended by RA 7394) that governs all consumer products sold in the Philippines.

### 2.5.6 Ancillary Industries

The Philippine Fisheries Code of 1998 defines ancillary industries as “firms and companies related to the supply, construction and maintenance of fishing vessels, gear, nets and other fishing paraphernalia; fishery machine shops; and other facilities such as hatcheries, nurseries, feed plants, cold storage, refrigeration, processing plants, and other pre-harvest and post-harvest facilities” (FRMP/BFAR/DA 2000). The 1987 National Conference on Fisheries Policy and Planning identified the following private sector groups under ancillary industries: (a) fish traders and retail distributors, (b) processors and packers of fisheries and aquaculture products, (c) suppliers of vessels and fishing gear, and (d) ice plants, refrigerated storage and transport operators.

Fish catch all over the Philippines are typically landed in either private, traditional or government owned landing centers. The government owned landing centers are fish ports managed either by the Philippine Fisheries Development Authority (PFDA) or by the local government units (LGUs) or jointly managed by PFDA and LGUs.

In 2003, *ca* 55.91% of the catch from *the commercial fisheries sub-sector* was landed in traditional landing sites, *ca* 22.18% in PFDA-managed major fish ports, *ca* 19.93% in private landing facilities, and the remaining *ca* 1.98% in ports managed by the LGUs. On a per region basis, except for the Cordillera Administrative Region (CAR), the commercial fisheries sub-sector in all regions unloaded their catch in traditional landing sites. The sub-sector also utilized the PFDA-managed facilities, but in 7 regions only, namely Regions 1, 4a, 6, 9, 11, 12 and NCR, where most (7/8) of the major fish port complexes are located. The unloading in private landing facilities were concentrated in Regions 5, 6, 9, 11 and 12, while the unloading in LGU-managed fish ports were recorded only in Regions 6 and 10. The preference of the sub-sector to unload their catch in traditional landing sites, where the handling practices cannot be efficiently controlled, can be partly attributed to the fact that there are only eight major fish port complexes in the country, namely the Navotas, Lucena, Camaligan, Iloilo, Davao, Zamboanga, General Santos City, and Sual Fish Port Complexes. The government owned major fish port complexes provide landing quays and market halls for fish traders and handlers. The capacities of the harbor and market facilities of the 8 major fish port complexes considerably vary. The Navotas Fish Port Complex has the most number of piers and market halls, followed by the General City Fish Port Complex. The Sual Fish Port Complex has the smallest landing quay, *i.e.* only 70 LM long. These major fish ports basically cater to the commercial fisheries sub-sector, with unloading, from 2001 to 2004, that range from an average of 320.33 metric tons in the Camaligan Fish Port Complex to 181,766.63 metric tons in the Navotas Fish Port

Complex. These fish port complexes mainly provide landing quays to local fishing vessels, although the Davao and General Santos Fish Port Complexes reported arrivals of foreign fishing vessels of a total of 7,619 (from 1995 to 2004) and 11 (from 2001 to 2004), respectively.

The catch from *the municipal fisheries sub-sector* is typically unloaded either in the traditional landing sites or in municipal fish ports. Data on the unloading in these sites are inadequate, although it can be noted that most of the municipal fisherfolk still utilize the traditional landing sites. However, the number of municipal fish ports, is seemingly increasing, although it is still not enough to meet the needs of the sub-sector. As of 2004, there is only a total of 47 PFDA-constructed municipal fish ports located in 11 regions in the Philippines. These municipal fish ports are managed either by the local government units (LGUs) or jointly managed by PFDA and LGUs. In terms of regional distribution, Region 4 (*i.e.* Regions 4a and 4b combined) has the highest number of these PFDA-constructed municipal fish ports (10 ports or 21.28%), followed by Regions 5, 6 and 3, with 7 (or 14.89%) 6 (or 12.77%) and 5 (or 10.64%) ports, respectively.

*The aquaculture sub-sector* primarily uses the 8 major fish ports in the country (namely Navotas, Iloilo, Lucena, Camaligan, Davao, Zamboanga, Sual and General Santos Fish Port Complexes) for the auctioning of aquaculture produce in the domestic market.

In terms of Ice Plants and Cold Storage (IPCS) facilities, *the commercial fisheries sub-sector* has access to the refrigeration facilities of the major fish port complexes. Most of these fish ports has ice making/storage, freezing and cold storage facilities that considerably vary in number and capacities. However, the data on the amount of ice produced in the major fish port complexes in the Philippines are inadequate. Although the amount of fish (in metric tons) unloaded in the eight fish port complexes in the Philippines by the commercial fisheries sub-sector are well documented, the amount of ice (in kg) produced per year in these ports was only reflected in five out of seven fish ports with ice plant / ice making facilities.

For *the municipal fisheries sub-sector*, majority of the fisherfolk still has limited access to as simple as ice making/plant facilities. Majority of them complains about the absence of these facilities in the municipal level. To date, there is a total of 23 government-owned ice making facilities that were are being managed by the LGUs all over the country. However, in December 2004, only two (or 8.7%) of these facilities were reportedly operational, and these were both located in Region 4a, specifically in Casiguran and Dingalan, Aurora. In addition to those ice making facilities under the LGUs, there are 27 government-owned ice making facilities all over the country. However, only 11 (or 40.74%) of these remained operational in 2004. Nine of them are presently on-lease to some private groups/individuals, while two operational facilities are now being managed by ARMM. As to the ice storage facilities available for the municipal fisherfolk, a total of 43 government-owned ice storage facilities are reported. However, only 11 (or 34.37%) remained operational as of December 2004, and they are either managed by LGUs (4 facilities) or on-lease to private groups/individuals (11 facilities). Although there is also a significant number of privately-owned ice making and ice storage facilities in almost all of the regions in the Philippines, the access of municipal fisherfolk to these facilities might be limited by their buying capacity.

For *the aquaculture sub-sector*, some of them avail of the refrigeration facilities of the major fish port complexes and other government-owned ice plants / ice making facilities located in different parts of the country. Most of them, however, procure ice from private ice plants / ice making facilities to enable them to properly chill their aquaculture produce immediately after harvest from fish ponds / fish cages.

### **2.5.7 Institutional Support System**

The Department of Agriculture takes charge of the overall planning and policymaking in the agriculture and fisheries sector at the national level. An attached agency to DA, BFAR functions as a technical arm involved in the conduct of research, formulation of policies and designing of fisheries programs and projects at the national level. Regional offices of the BFAR particularize or extend the technical assistance in the different regions of the country, especially in selected critical or important fishing grounds.

The institutional support provided by the government to the municipal fisheries sub-sector is focused on technical and institutional support provided by the BFAR to the LGUs and fisher organizations in the light of the devolution of municipal fisheries management functions.

Fisheries credit through government lending institutions such as Land Bank and Quedancor are mostly acquired by fishpond owners. Other formal credit institutions include private commercial banks, private development banks and stocks savings and loan association, rural banks and thrift banks which allot a greater proportion of the total fisheries loans to commercial fisheries and large fish farmers or aquaculture operators. Credit for small-scale marine and aquaculture fisheries has been practically non-existent under most of the banks' regular loan activities. The local government units also formulate and implement specific fisheries policies and projects, especially at the provincial and municipal levels. They also provide micro-credit for small projects in the agriculture and fisheries sectors.

AFMA mandates the creation of a network of smallholder Cooperatives called "National Marketing Umbrella" that engages in marketing activities. In addition, section 34 of the Fisheries Code of 1998 provides that at least 10 % of government loans to the fisheries sector be allotted to post-harvest and marketing projects. More specifically, the *Ginintuang Masaganang Ani* Program for 2002-2004 aims to improve production-marketing systems in the fisheries sector so that it becomes "more efficient and effective". From 2000-2004, the government implemented the Fisheries Resource Management Program (FRMP), together with partner NGOs, in selected critical fishing grounds in the country. One of the aims of the FRMP is to develop complementary livelihoods to fishing by providing training and marketing support to fisher folk Cooperatives, among other services.

Since the 1990's, the government has provided funding to the construction of more than 200 fish landing ports through its national municipal fishing ports program and the Fisheries Sector Program of the early 1990's. Besides, there was an ice supply program led by the private sector which built about 36 ice and cold storage facilities. The Philippine Fisheries Development Authority (PFDA) implements the government program for the establishment and improvement of regional and municipal fish ports/landings, ice

plant and cold storage and other post-harvest and marketing support facilities. Problems in this area include the concentration of fishing ports in urban areas where there is potential for investment and growth, but far from where fisher folk communities can be found.

Research and development play a significant role in providing inputs in the formulation of management options for the country's marine fishery resources. The Philippine Council for Aquatic and Marine Research & Development (PCAMRD) and the Bureau of Agricultural Research (BAR) jointly packaged the National Fisheries and Aquatic Resources Research Agenda (NAFARRA) 2000, a five-year plan designed to address three fundamental concepts in fishery and aquatic resources: rehabilitation, protection and enhancement. The R & D programs and priorities of the commodities and resources included under the STAND Philippines 2000, particularly those under the export winners and basic domestic needs, are highlighted in the NAFARRA (Pagdilao 1996).

For tuna, the R & D areas include resource assessment aimed at generating resource-based information for the formulation of management options to safeguard the resources from further overexploitation. To support the R & D component, the aged tuna fishing fleet should be upgraded to mount offshore fishing operations in the Western Pacific and in order to compete with other nations fishing in international waters. Marine offshore fisheries R & D will focus on exploration of the country's offshore/EEZ areas, oceanographic studies, gear and vessel development/improvement, and socio-economic and policy studies.

Among the principal policy recommendations of the 1987 National Conference on Fisheries Policy and Planning was to provide incentives for the commercial fisheries sector to fish farther in the EEZ. On this specific recommendation, the Conference stated thus:

- (a) The conflict between the municipal fishing and commercial fishing should be alleviated by providing incentives to the commercial fishing fleet to go farther in the EEZ. Redeployment of the commercial fleet to deep waters and into the EEZ would present possibilities to exploit resources found thereat and to alleviate intense fishing pressure on nearshore stocks. Consequently, there would be stock recovery and increased catches of municipal fishermen; and
- (b) A policy on selective expansion of marine fisheries appears justified, but specific measures would require considerable scientific as well as economic evaluation prior to implementation. New incentives for improvement of fishing vessels and acquisition of fishing equipment should be considered in addition to incentives already available from the Board of Investments. A review of tax credits and exemptions from duties and taxes on imported capital equipment and supplies may be required.

The Conference emphasized that the incentives, to be effective, must not be of a general nature but must be specifically designed to encourage the patterns of activity that need to be fostered. This means that, since commercial vessels are banned from operating in municipal waters (by virtue of RA 7160: the Local Government Code of 1992), and encouraged to fish farther out into the larger bounds of the country's EEZ, specific provisions have to be made to help them acquire the appropriate gear and assistance. FAO (1998) noted that in developing countries most fishing gear research,

for example, was government-funded but funds were usually inadequate. To reduce costs, it suggested providing incentives for commercial vessels to undertake research; incentives could include increased quota and fishing out of season.

Realizing the need to modernize Philippine fisheries, the Department of Agriculture - Bureau of Agricultural Research (DA-BAR) decided to orchestrate a strong and coherent partnership and collaboration with the various fisheries research, development and extension (RDE) institutions and agencies in the Philippines. Three RDE networks in fisheries, namely Capture Fisheries, Aquaculture and Fisheries Post Harvest and Marketing networks, were conceptualized after a series of extensive group discussions, workshops and consultations with the various stakeholders. These activities also gave birth to the National Integrated RDE Agenda and Program (NIRDEAP) for each of the three fisheries networks.

In particular, the NIRDEAP for Fisheries Post Harvest and Marketing was envisioned to generate appropriate post harvest technologies and information that are responsive to the needs of the sub-sector. It is believed that these technologies and information are necessary in order to help improve the performance of the fisheries post harvest sub-sector, in particular, and to increase and sustain the productivity of the fisheries sector, in general. Under the NIRDEAP for Fisheries Post Harvest and Marketing, the sector's RDE thrusts are focused on the following.

- (1) Reduction of fisheries post harvest losses throughout the fish post harvest chain, i.e. from harvest/capture site until the fishery products reach the consumers
- (2) Generation of technologies for fisherfolk communities, evaluation of their socio-economic conditions
- (3) Improvement of fish and fishery product safety
- (4) Enhancement of the competitiveness of the country's fish and fishery products both in the local and export markets
- (5) Isolation and characterization of marine natural products
- (6) Improvement of information dissemination system in fisheries post harvest and marketing
- (7) Development of an effective marketing strategy for fish and fishery products in the country

## **2.6 Institutional Environment**

### **2.6.1 Policy and Regulatory Framework**

The Philippine legal and policy framework is hierarchical. At the apex is the Philippine Constitution followed by national laws and international agreement, then administrative issuances to implement national laws. At the lowest rung are the ordinances by the LGUs. The Philippine Constitution's Article XIII, Section 7 stipulates, "The state shall protect the rights of subsistence fishers."

The major Philippine laws that serve as the foundation for the current policy and regulatory framework for fisheries in the Philippines are the following: (1) Philippine Fisheries Code of 1998 (RA 8550); (2) Agriculture and Fisheries Modernization Act of 1998 (RA 8435); (3) Local Government Code of 1991 (RA 7160); (4) National Integrated Protected Areas System (NIPAS) Act of 1992 (RA 7586), and (5) Environmental Impact Statement (EIS) System (PD 1586) of 1978 and related laws.

As the main law, the 1998 Fisheries Code's main concern is the proper management/husbanding of the country's fisheries resources. Section 3 of the Code very clearly states that it shall be applied/enforced in: (1) "all Philippine waters including other waters over which the Philippines has sovereignty and jurisdiction and the country's 200-nautical mile Exclusive Economic Zone (EEZ) and continental shelf; (2) all aquatic and fishery resources whether inland, coastal or offshore fishing areas, including but not limited to fishponds, fish pens/cages; and (3) all lands devoted to aquaculture, or businesses relating to fishery, whether private or public lands."

Priorities include protection of fishery and aquatic resources, optimal utilization of existing resources, maintenance of ecological balance and the quality of the environment, and improving and rationalizing the domestic market. Its objectives are poverty alleviation, social equity, food security, rational use of resources, people empowerment, and sustainable development. The basic operations are through LGUs and FARMCs for municipal waters, and DA-BFAR for all fisheries and aquatic resources other than municipal waters. Plans include Comprehensive National Fisheries Industry Development Plan, Municipal Fisheries Development Plans, Comprehensive Post-harvest and Ancillary Industries Plan

The AFMA supports the Fisheries Code. Its major concern is to provide the appropriate budgetary and logistical requirements for modernization of the country's agricultural and fisheries base. Its priorities include sustained increases in production, industrialization and full employment, as well as optimum production of goods, driven by a market-oriented approach within a highly competitive economic environment. The AFMA's objectives are poverty alleviation, social equity, food security, rational use of resources, people empowerment, sustainable development, and global competitiveness. It operates through Strategic Agricultural and Fisheries Development Zones (SAFDZs) as identified by DA; also through the agriculture and fisheries modernization programs of the LGUs. The AFMA's planning systems are through Agriculture and Fisheries Modernization Plan (AFMP) at the national and LGU levels and SAFDZ Plans.

The Local Government Code of 1991 provides another policy support. Consistent with the government policy to promote local autonomy and decentralization, the Code established the local government unit (LGU) as the key manager of resources within its boundaries. In the process, the Code also provided for the devolution of the responsibility to provide a number of basic services from national government agencies to the local government units (provinces, cities/municipalities and villages). Responsibilities devolved to the LGUs included the enforcement of fishery in municipal waters, the provision of extension and on-site research services and facilities related to agriculture and fishery activities, the enforcement of environment and natural resources laws

within the territory, water and soil resources utilization and conservation projects and the improvement and development of local distribution channels.

The Local Government Code very specifically (Section 149) provides the municipal government with the authority to grant fishery privileges in municipal waters and to impose rentals, fees and charges. Fishery privileges include – the erection of fish corrals and oyster, mussel and other aquatic beds, the collection of fry (bangus, prawn, kawag-kawag, etc.), and the catching of fish using nets, traps and other gear. The resource management responsibilities (taking into consideration food production, human settlements and industrial expansion) of the local government unit are also exercised through the preparation of comprehensive land use plans and the enactment of zoning ordinances (Section 20).

The NIPAS Act of 1992 is another national-level complementary policy. Aliño et al (2004) cite the NIPAS Act as an essential element of the policy framework for fisheries management, as it provides a common framework for national parks and a protected areas system. The Act also provided for the establishment of priority-protected areas, including the fisheries-rich Apo Reef Marine National Park in Mindoro and the Malampaya Sound PLS in Palawan. Following the ability to establish MPAs at the national level, the Local Government Code also empowered municipal or city legislative bodies to establish MPAs within municipal or city territories through municipal ordinances.

National laws related to the EIS and/or Environmental Impact Assessment (EIA) also has bearing on fisheries management. Under these laws, government agencies, government-owned or controlled corporations and private companies are required to prepare an EIA for any project or activity that significantly affects the quality of the environment. Under this set of laws, any project defined as environmentally critical or located in an environmentally critical area is required to prepare an EIS to be reviewed by the Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources. The detailed procedures for the handling of EIAs are outlined in various Department Administrative Orders (DAOs). The requirements for EIAs and ECCs were subsequently also incorporated into the Fisheries Code of 1998. Some aquaculture projects are covered by these laws.

Other relevant national laws include RA 9275 (2004) Philippine Clean Water Act of 2004, RA 9147 (2001) The Wildlife Resources Conservation and Protection Act, and RA 8371 (1997) The Indigenous People's Rights Act. Under the umbrella of these laws and their implementing rules and regulations, are the following sets of regulations that complete the policy and regulatory framework for Philippine fisheries: (1) Department Administrative Orders (DAOs) issued by the different departments/national government agencies (Department of Agriculture, Department of Environment and Natural Resources, etc.); (2) Fisheries Administrative Orders (FAOs) issued by the Department of Agriculture through the Bureau of Fisheries and Aquatic Resources (DA-BFAR); and (3) Municipal Ordinances issued municipally or city governments.

There are several international treaties and agreements that have also bearing on the policy and regulatory framework for Philippine fisheries. These instruments, once ratified by the Senate, become part of the Philippine law. The key international agreements include the 1995 FAO Code of Conduct for Responsible Fisheries, 1992 Convention on Biological Diversity, 1992 Action Agenda for Sustainable Development, and 1982 United Nations Convention on the Law of the Sea, FAO/WHO-Codex Alimentarius Commission.

## 2.6.2 Existing Institutional Mechanisms/Arrangements

The management of the fishery resources is distributed among many government agencies or instrumentalities. The basic jurisdictional division are as follows: (1) municipal or city governments for “municipal waters” and resources within the territorial boundaries of these municipalities or cities; (2) DA-BFAR for commercial (e.g. outside municipal waters) fishing activities and public lands such as tidal swamps, mangroves, marshes and foreshore land and ponds; and (3) DENR for shoreline and foreshore areas and, through Protected Area Management Boards, for areas under the category of protected landscapes and seascapes, such as mangrove swamp forest reserves, under the NIPAS Act. These are elaborated in the following sections.

### 2.6.2.1 Local Government Units

Municipal waters include streams, lakes, inland bodies of water and tidal waters within the municipality which are not included within the protected areas as defined under the NIPAS Act. These also include marine waters up to fifteen kilometers from the municipality’s coastline. The municipal or city governments are expected to regulate fisheries and aquaculture activities in municipal waters to achieve their objectives. The LGU’s interest in properly developing and managing fisheries resources is driven by the fact that these resources contribute directly and significantly to food production, livelihood opportunities and the general well-being of their residents. Regulatory, management and development mechanisms are operationalized through ordinances, delivery of services and undertaking programs and projects. Options available to local governments include, among others, the following: (1) authority to grant fishing privileges or license fishing operations in municipal waters; (2) banning or restricting the use of certain fishing methods, techniques or gears; (3) regulating the capture of certain species and/or sizes of fish; (4) land/water use planning and zoning; (5) habitat conservation and restoration (i.e., establishment and maintenance of marine protected areas, fish sanctuaries and refuges, mangrove reforestation, coral reef conservation, etc.); (6) infrastructure and facilities (e.g. roads, cold-storage, markets, etc.); (7) credit; and (8) agriculture and fishery extension services and livelihood training.

Relative to fisheries and aquaculture, the LGUs have the following specific responsibilities: enact a municipal ordinance delineating the boundaries of municipal waters and providing rules and regulations for licensing and permits; establish license fees for fishing in municipal waters; enact, in consultation with BFAR, special ordinances declaring special demarcated fisheries areas, closed seasons, environmentally critical areas and sanctuaries; maintain a registry of municipal fisherfolk; enforce fishery laws, rules and regulations and municipal ordinances.

Recognizing that local governments would benefit from consultation with and the involvement of fisherfolk and their organizations, the Fisheries Code provides for the creation of Fisheries and Aquatic Resources Management Councils (FARMCs) at several levels – barangay, municipality/city, cross-municipality and national. Membership in these councils includes representatives of government agencies and institutions, as well as fisherfolk, fishworkers and other stakeholders. The LGUs and NGAs consult and coordinate with the FARMCs as they carry out their regulatory, management and development functions over fisheries resources. At the municipal or city level, the FARMCs are expected to assist in the development of the Municipal Fisheries Development Plan for submission to the Municipal Development Council, make recommendations for municipal fishery ordinances, assist in the enforcement of fishery laws, rules and regulations in municipal waters, and provide advice, whenever necessary, to the municipal government.

### 2.6.2.2 Inter-LGU Mechanisms

Very often, one or more municipalities share a bay, gulf, lake, river and/or dam. In such cases, the management of such water bodies and their fisheries resources need to be shared among the affected municipalities or cities. Although the sharing of these fisheries resources provides opportunities for collective action and the sharing of effort, resources and costs among local governments, it also can serve to increase the complexities and difficulties of the management effort.

The Fisheries Code states that the management of contiguous fishery resources “shall be done in an integrated manner, and shall not be based on political subdivisions of municipal waters in order to facilitate their management as single resource systems.” Municipal or city governments are encouraged to group themselves and coordinate with each other to achieve the objectives of fishery resources management. Such alliance is also given in the Local Government Code. In fact, the Fisheries Code envisions the formation of Integrated Fisheries and Aquatic Resources Management Councils (IFARMCs) as the venues for closer collaboration between and among local governments in the management of shared resources. These IFARMCs have functions similar to the functions of municipal FARMCs. IFARMCs, however, need to relate to all municipal or city governments they serve. The Chairpersons of the Committees on Agriculture/Fisheries, the Fisheries Officers and the Development Officers of the relevant municipalities and/or cities are expected to serve on the IFARMCs together with representatives of NGOs, the private sector and fisherfolk.

Aside from encouraging the clustering of municipal and city governments around shared resources, others are also advocating the more active assumption of environmental management responsibilities by the provincial governments. Under the Local Government Code, the responsibilities of the provincial government are not specific.

### 2.6.2.3 Bureau of Fisheries and Aquatic Resources (BFAR)

BFAR is the country’s premier fisheries management agency. In coordination/cooperation with other national government agencies, BFAR has jurisdiction over the management, conservation, development, protection, utilization and disposition of all fisheries and aquatic resources of the country, except those within municipal waters. In municipal waters, BFAR will coordinate with and assist LGUs, FARMCs and other concerned agencies in undertaking the functions specified earlier.

Under the Fisheries Code, it was reconstituted as a line bureau under the DA. It has five core functions: (1) policy and enforcement, (2) industry development, (3), regulate commercial fishing, (4) regulate commercial fishing and (5) research. Policy and enforcement involve formulating rules and regulations for the conservation and management, regulation, conservation and protection of the fishery resources, establishing control and surveillance of fishing activities within Philippine waters; and formulate rules and regulations for the management of straddling fish stocks and highly migratory fish stocks. Industry development involves the preparation and implementation of this Industry Plan, provide extensive development support services, develop value-added fisheries products for domestic consumption and export, and coordinate with the LGUs and other concerned agencies for the establishment of productivity enhancing and market development programs in fishing communities.

Regulate commercial fishing include issuing licenses for the operation of commercial fishing vessels and monitoring and review fishing agreements between Filipinos and foreigners. Part of this function is issuing Fishpond Lease Agreements (FLAs) for public lands suitable for aquaculture industry monitoring cover the establishment and maintenance of a Comprehensive Fishery Information System, coordinate efforts relating to fishery production, and implement an

inspection system for import and export of fishery/aquatic products and fish processing establishments. The research function focuses on formulating and implementing a Comprehensive Fishery Research and Development Program.

BFAR has the following organizational units: divisions, centers and regional offices. The ten divisions of the Bureau include: Fisheries Resources Management Division, Capture Fisheries Technology Division, Fisheries Post Harvest Technology Division, Fisheries Industry Development Support Division, Inland Fisheries and Aquaculture Division, Fisheries Policy and Economics Division, Fisheries Regulatory and Quarantine Division, Legal Division, Administrative Division and Finance Division. BFAR also has eight national technology centers which are operated and maintained for activities related to technology generation, field testing of technologies, extension services, demonstration and training / seminars in support of policy formulation and project implementation on fisheries development and conservation in coordination with concerned agencies and organizations. These national technology centers include: Fisheries Biological Station Complex, Mindanao Freshwater Fisheries Technology Center, National Brackishwater Fisheries Technology Center, National Freshwater Fisheries Technology Center, National Inland Fisheries Technology Center, National Integrated Fisheries Technology Development Center, National Marine Fisheries Development Center, and the National Seaweeds Technology Center. Aside from the divisions and national technology centers, BFAR maintains regional offices in all the administrative regions of the country. These regional offices will have functions such as monitoring, control and surveillance (MCS), training and extension services. The regional offices also supervise the operations of the Provincial Fisheries Offices. Through its regional offices, it maintains and operates seven Regional Fishermen's Training Centers (RFTC) that aim to develop skills of technical fisheries staff of the LGUs and other agencies involved in fisheries implementation.

#### **2.6.2.4 Department of Agriculture (DA)**

The Fisheries Code created within the DA the position of Undersecretary for Fisheries and Aquatic Resources for the primary purpose of attending to the needs of the fishing industry. A number of divisions/bureaus within the Department of Agriculture have responsibilities that also cover the fisheries sector. These divisions include the following as indicated in the AFMA:

The Planning and Budget Division, Public Investment Program Division, and Program Monitoring and Evaluation Division are responsible for the DA's planning service. These divisions handle AFMA-related planning activities, as well as formulate the agriculture and fishery infrastructure plan. Agribusiness and Marketing Assistance Division takes care of Agribusiness and Marketing Assistance Service (AMAS). It provides direct assistance to the private sector, including concerned POs and NGOs, in marketing ventures and in the conduct of market analysis. Two key units are involved for information-related concerns: Bureau of Agricultural Statistics for data on agriculture and fisheries research; and Agricultural and Fisheries Information Service for dissemination of agriculture and fisheries production market information. For post harvest services and infrastructure, the Bureau of Post Harvest Research and Extension takes the lead.

The Bureau of Agriculture and Fisheries Product Standards is responsible for setting and implementing standards for fresh, primary- and secondary-processed agriculture and fishery products. The Bureau of Agriculture Research Serves as serves as the Secretariat for R&D of the Council on Extension, Research and Development in Agriculture and Fisheries, as well as develop the agriculture and fisheries R&D information system. The Agriculture Training Institute provides leadership in formulation of the national agriculture and fisheries extension agenda, as well as oversees the National Extension System in Agriculture and Fisheries.

### 2.6.2.5 Department of Environment and Natural Resources (DENR)

The Department of Environment and Natural Resources (DENR) administers environmental management, conservation and development on a national level. Its role in fisheries management pertains to foreshore and shoreline areas, as well as protected areas. Institutional arrangements within the DENR affecting fisheries vary. One is with the Protected Area Management Boards (PAMBs) for protected areas under the NIPAS Act. The PAMBs become involved then in fisheries management if the protected area has such resources and other subsequent actions, at the national level and at the local government level. PAMBs are normally multisectoral bodies representing local stakeholders. Municipalities may also decide to create such bodies to manage marine protected areas (MPAs) established by municipal ordinance. In 2002, the DENR's Coastal and Marine Management Office (CMMO) was established to coordinate and integrate all coastal management activities, especially in policy review and formulation, coordination and integration of development and implementation of coastal programs and projects, including the fisheries. Parallel CMMO-type units are now organized at the regional and community levels to respond to the technical needs of LGUs in their efforts to implement coastal resource management programs and projects.

Under the Fisheries Code, environmentally critical fisheries-related is required to prepare an Environmental Impact Statement (EIS) and obtain an Environmental Compliance Certificate (ECC) from the DENR. The line agency directly responsible for the EIS is the Environmental Management Bureau (EMB). The implementing rules and regulations of the Fisheries Code specify that BFAR establish an Environmental Unit to coordinate with concerned agencies in assisting project proponents to prepare and submit EISs. The National Mapping and Resource Information Authority (NAMRIA) provides assistance in mapping of the fishery habitats. In particular, NAMRIA assists in the delineation of municipal waters.

### 2.6.2.6 Other Government Agencies

There are a host of other government agencies involved to some extent in facets of fisheries management. For the R&D, it is principally the National Fisheries Research and Development Institute (NFRDI). Another agency that play key role is the Department of Science and Technology (DOST) through the Philippine Council for Aquatic and Marine Research and Development (PCAMRD). Other players include the state universities and colleges (SUCs) and other members of the National Aquatic Resources Research and Development System.

There are specialized bodies with large fisheries component. For example is the Laguna Lake Development Authority (LLDA) for lake fisheries. For fishing vessels, two attached agencies of Department of Transportation and Communication are involved: the Philippine Coast Guard (PCG) and the Maritime Industry Authority (MARINA). The registration of shipping vessels is MARINA's primary concern. The PCG is involved in shipping and maritime safety.

For education and training, those involved include Commission on Higher Education (CHED), Technical Education and Skills Development Authority (TESDA) and Department of Education. The Department of Trade and Industry (DTI) takes the lead in marketing. It provides support and incentives for investments in agriculture and fisheries production, as well as promotion of agriculture and fishery products through domestic and international trade fairs and exhibits.

The law enforcement function is mainly handled by the Philippine National Police (PNP)–Maritime Command for both fisheries and coastal laws. Others that provide law enforcement support include the Philippine Navy and the Philippine Coast Guard. For infrastructure development, the agencies involved include the Department of Public Works and Highways

(DPWH), Philippine Ports Authority (PPA), Philippine Fisheries Development Authority (PFDA), Department of Interior and Local Government (DILG).

### 2.6.3 Coordinating Across Agencies

Collaboration and coordination across the many government bodies and agencies involved in fisheries has been accomplished through various non-permanent mechanisms such as projects, programs, task forces, technical working groups and memoranda of agreements/understandings.

The record of success of these various initiatives has been mixed. Some have been successful and continue to be not only successful but also sustainable. Others encountered initial success which could not be sustained over the medium and long-term. Other initiatives failed and several did not even get off the ground. The AFMA and the Fisheries Code have tried, however, to institutionalize the collaboration and coordination across the various government agencies through several mechanisms. For fisheries research, it involves multi-stakeholder representation of the following agencies/sectors in the Governing Board of the National Fisheries Research and Development Institute. For the nationwide Monitoring, Control and Surveillance (MCS) System, it will be in collaboration and coordination with LGUs and other government agencies. There is a proposal to establish the National Integrated Human Resources Development Plan in Agriculture and Fisheries involving the CHED, the DepEd, TESDA, SUCs and other agencies. In the case of RDE, there will be a creation of the Council on Extension, Research and Development in Agriculture and Fisheries (CERDAF) involving government agencies involved in R&D as well as in extension services. In spite of all the mechanisms in place for interagency coordination and collaboration, coordination is often wanting. Reasons include overlapping functions and mandates, insufficient human resources, and plans of the various agencies are not integrated.

### 2.6.4 Role of the Private Sector

Both the AFMA and the Fisheries Code highlight the need for private sector participation. The Fisheries and Aquatic Resources Management Councils (FARMCs) serve as the primary mechanism for participation by the private sector in fisheries management. The FARMCs are composed not only by representatives of government agencies, but also representatives of NGOs, the private sector, municipal and commercial fisherfolk, fishworkers and processors. As an organizational entity, the FARMCs are to be formally consulted for the establishment of fishery refuges and sanctuaries; license fees for municipal fishermen; and enactment of municipal fisheries ordinances, among others.

There also are a number of private sector institutions/organizations involved in fisheries. A distinction has to be made between the business sector and the civil society sector. The business sector would be composed of individuals and firms engaged in business as well as the associations, usually nonprofit in nature, created by these individuals and firms to look after their collective interests. The focus of individuals, firms and organizations in this sector is investment and trade by creating goods and services, providing employment opportunities, innovation and economic growth and maximizing profits for investors to ensure further investment that will allow the business to continue to innovate. In line with this focus, business organizations include: individuals (sole proprietorships), business partnerships, for-profit corporations and their associations (including farmer associations and cooperatives, commercial fishing associations).

On the other hand, the civil society sector (sometimes also referred to as the third sector) is focused on social development through the creation of opportunities for individual growth and creativity, providing support and services for those in need or excluded from mainstream society and acting as guardians of the public good. The civil society sector would therefore include non-government organizations active in advocacy, community development and delivery of social and

other services. It should also include local communities that have organized themselves – particularly those local communities that are involved in the co-management of fisheries and other coastal resources. The continuing challenges to these private sector organizations include difficulties in increasing memberships, poor membership contributions to the organization, and lack of recognition by government agencies.

## 2.7 Key Development Challenges

A host of inter-related and/or interlinked problems beset the Philippine fisheries (Figure 2.7.a). These issues are nothing new. They have already been identified in numerous national consultations, and have likewise been described in earlier national plans. More recently, these issues are elaborated in the DA-BFAR publication titled “In turbulent seas: The status of Philippine marine fisheries” (Luna et al 2004). Hence, the issues are synthesis of the secondary literature, as well as the outputs of the various consultations. These problems are illustrated in a simplified manner more as a communication tool, rather than presenting the more informal cause-and-effect relationships.

In general, the Philippine fisheries is not yet sustainably managed. This regrettable condition in turn leads to greater poverty, more resource use conflicts over the dwindling resources and lower contribution to the national economy. Broadly, the ‘direct’ causes of the central problem may be classified into seven overlapping clusters. One is the **depleted fishery resources**. There is excessive fishing effort brought about by several factors, such as the increasing number of fishers, catching of immature/juvenile fish, poaching/intrusion in prohibited fishing areas and by-catch. Two is the **degraded fishery habitats**. A key contributor is the conversion of such fishery habitats into other economic uses, such as the conversion of mangroves into human settlements or converting portion of coral reef areas into tourism structures. Other contributing factors - like nutrient pollution and siltation - are brought about by some land-based agricultural activities. Natural stresses may take the form of El Nino. Destructive fishing practices contribute to both the depletion of fishery resources and habitat degradation.

There is an **intensified resource use competition** due to the dwindling resources. At present, the efforts for both the commercial and artisanal sectors are already beyond the sustainable levels. Notwithstanding, population pressure is a crucial factor, as there are more new entrants each year brought about by limited livelihood opportunities outside the sector. Competition is aggravated by ineffective implementation of zonation scheme. Under the Fisheries Code, the waters within 15 km from the shoreline are reserved for the exclusive use of the municipal fishers; however, this delineation in resource use is not fully implemented.

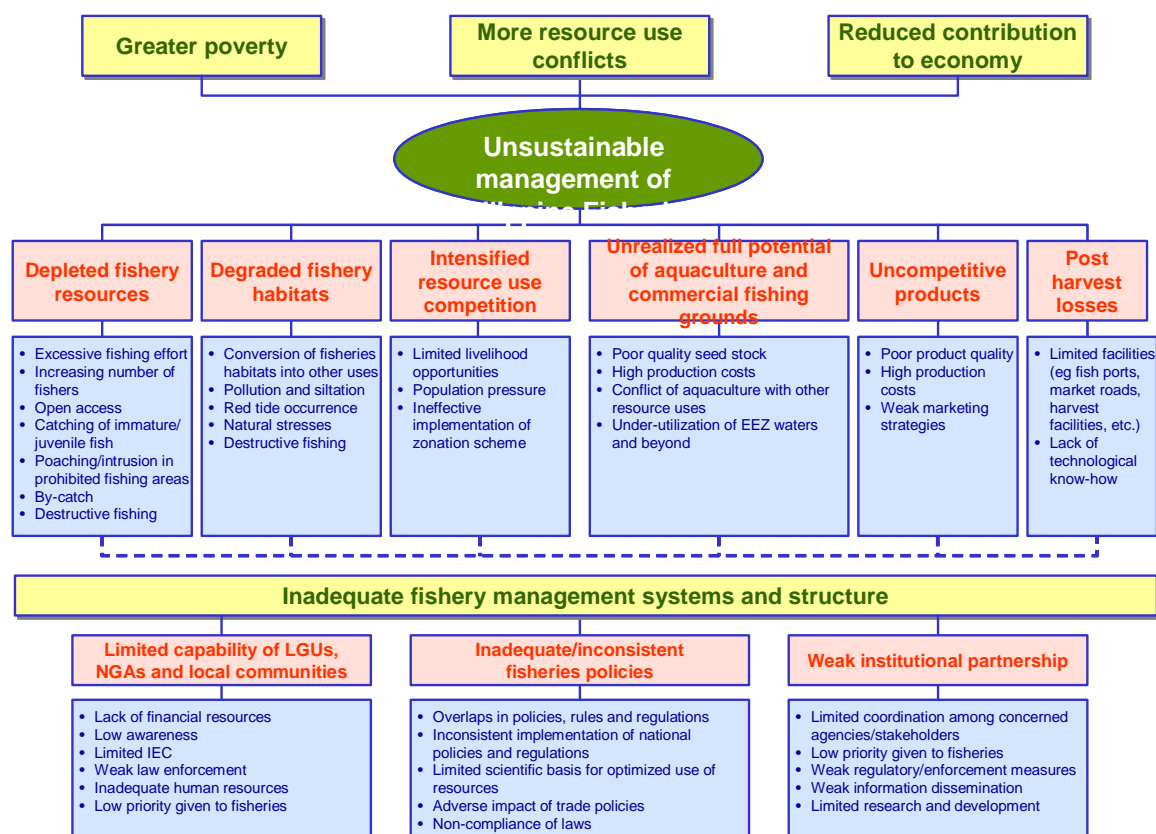


Figure 2.7.a. Key problems/issues confronting the fisheries sector.

Another core problem is the **unrealized full potential from aquaculture and commercial fishing grounds**. There is consensus that the full potential of aquaculture is not fully realized. Existing technologies are quite ‘crude’ when compared with the modern technologies of neighboring Asian countries. There is poor quality of seed stock, and at the same time high production costs. Aquaculture activities have also associated environmental/ecological impacts, such as pollution and proliferation of exotic species. There are also conflicts of aquaculture with other resource uses, such as human settlements and tourism. For commercial fisheries, it is possible that fishery resources in off-shore and EEZ areas may be commercially exploited.

Particularly in the export market, the **uncompetitive products** are not uncommon. Among others, some Philippine fishery products are of poor quality, have high production costs, and are hampered by weak marketing strategies. Such uncompetitive products are closely linked with post harvest losses, which have been a perennial problem. The sixth issue pertains to **post harvest losses**. About one third of the harvested products are spoiled before they reach their market destinations. Infrastructure facilities, such as fish ports, market roads, dry/cold-storage facilities, are quite limited. Associated with this lack of facilities is the limited technological know how.

All of the problems may be ultimately traced to some weaknesses in the current institutional set-up. Overall, there is **‘inadequate fishery management systems and structure’**. Such institutional constraint has been described in detail in the DA-BFAR publication (Luna et al 2004). One major reason for this is the **limited management capability of LGUs, NGAs and local communities**. The institutional support is simply not sufficient to address the whole gamut of issues confronting the sector. The management agencies are hampered by the lack of financial resources, as well as inadequate human resources. Within the agriculture sector, low priority has always been given to the fisheries when compared to either crops and livestock sub-sectors. The second key factor may

be attributed to **inadequate/inconsistent fisheries policies**. Some provisions of the national policies are not consistent: the Fisheries Code and the NIPAS Act promote the conservation of fishery resources and habitats; however, the AFMA promotes the full industrialization of the fisheries sector. In some cases, some national policies and local regulations have been promulgated with limited scientific basis. There are likewise international conventions/commitments that may have an adverse impact on the fisheries sector. For example, trade policies on import liberalization are putting the small-scale fishers at a disadvantage given the importation of cheap fishery products.

The third cause may be aptly called as **weak institutional partnership**. There has been limited coordination among concerned agencies/stakeholders, either horizontally or vertically. Ideally, the national enforcement agencies (PNP maritime and the Philippine Navy) should work closely with the local law enforcement units. The collaboration is quite loose, however, that often results in weak enforcement of fisheries rules and regulations. Another weak partnership is between the management agencies and those institutions involved with research and development (R&D). Hence, there is often limited dissemination of relevant information and appropriate technologies. Overall, the problems confronting the sector are intricately-linked, which could be best addressed in comprehensive and holistic manner.

## 2.8 Key Development Opportunities

Crucial to the sustainable development of the fisheries sector is the attainment of stability of productivity growth and social equity within the sector. In general, the Philippines fisheries sector has great potential based on intrinsic strengths. There include the vast water resources for increasing production; the tropical condition, which allows year-round fish culture; increasing demand of fish and fish products from primary markets, such as US and China; and the strong domestic market. Fish is important to human health and nutrition comprising about 75% of the national animal protein requirement. The Fourth Nutrition Survey conducted by the DOST in 1993 reported a 36 kilograms (kg) per capita per year consumption of fish and fishery products. The survey also revealed a continuous decrease in consumption from 29 kg per capita per year in 1995-1997 to about 27 kcy in 1998-2000. It was noted that the population growth rate was higher than fish production growth rates for the periods 1995-2000 and 1990-2000 (2.36% and 2.34 % respectively), which possibly contribute to the decline. Urban centers are the real market for fish and other farmed products, with its higher average family income, higher family expenditure, and a thriving food service sector. Philippine cities presently account for 30% of the nation's population (FAB, 2005).

This factor, and the growing population, assures that fish will continue to have high demand in the local, as well as international markets. Based on these strengths, key opportunities pertain to: (1) delineation of property rights (2) utilization of offshore and exclusive economic zone, (3) aquaculture/mariculture expansion, (4) improved postharvest subsector, (5) export potential, and (6) natural resource pricing.

### 2.8.1 Delineation of Property Rights

Traditionally, the municipal fisheries is an open access subsector. Practically, anyone can be a fisher and fish as much as he wants with little government interference. The result of this free-for-all regime is the overexploitation of coastal fisheries, which is not just on-going in particular areas but even at the national scale. The proper delineation of property rights, specially in the municipal fisheries, is important to sustainable development. When the long-term rights of fishers and other users to marine resources are well defined and secure, they will tend to exploit them in a more sustainable manner. This is because they are assured that the ultimate benefits of their practices and activities will accrue to them.

As a whole, the provisions in the Fisheries Code granting fishery rights to local organizations have provided a general basis for a clearer delineation of property rights at the municipal level. The LGUs now have to appropriate these rights to fishers and users in a socially equitable and environmentally sustainable manner. In the distribution of rights, LGUs must put utmost importance to the ability of organizations to sustainably manage municipal fisheries resources. To do this, LGUs must require proposals from organizations wanting to manage resources to include an environmental impact analysis, which will serve as an important basis in the granting of fishery rights. In addition, the Fisheries Code provides for the granting to municipal folks, organizations and cooperatives of demarcated fishery areas for fish capture, mariculture and fish farming. Furthermore, resident fisherfolks, organizations and cooperatives have the priority in the granting of fishery rights by the LGUs and in the exploitation of demarcated fishery areas of their respective communities.

## **2.8.2 Utilization of Offshore and Exclusive Economic Zone (EEZ)**

There are good prospects in the commercial fisheries subsector owing to the potentials of the country's EEZ that covers an area of 1,893,287 km<sup>2</sup>. Although the country has vast EEZ water areas, these have not been exploited to the fullest. Many boats in the current commercial fishing fleet fall within the small and medium category and are not suitable for fishing in far-flung areas. Aside from the EEZ, commercial fishing is also moderate in other deep-sea areas, such as in the Pacific side of the country.

## **2.8.3 Aquaculture/Mariculture Expansion**

The Philippines is endowed with abundant stocks of shrimps and other high value fishery resources. However, many of the Philippine fishery resources are at, or near the point where maximum sustainable yields can be harvested. For increases in supply, the emphasis will have to be placed on aquaculture/mariculture. By expanding aquaculture, the pressure on existing supplies of wild fish will be reduced.

## **2.8.4 Improved Post Harvest**

The post-harvest sector contributes significantly to the economy and to the livelihoods of coastal communities. Many are involved in some aspects of fisheries post-harvest activities including small-scale processing, marketing and trading, even if it is not their major focus of work. For the fisheries sector to fully develop, additional port and post-harvest facilities are necessary. As earlier mentioned, the post-harvest losses in fisheries are substantial and lowering these to a minimum will do a lot to improve productivity. The available data on fisheries facilities indicate that the country has a large number of ports and most of these are operating. However, it has been pointed out that several coastal regions do not have regional ports and that many coastal municipalities do not have ports. In addition, ice plants, freezers and cold storages are lacking in many areas. In some places where facilities are available, these are underutilized because of the reduced landed harvest by the fishermen due to stock depletion.

## **2.8.5 Export Potential**

Export earnings from fish and fisheries products constitute a major part of foreign exchange earnings. Global fish trade in 2000 was reported to be US\$55.2 billion and is growing at an annual rate of 4% (FAO, 2002). This trade growth is important and provides great opportunity for the Philippine fisheries exports. As in most developing countries, Philippine trade of fishery products is continuously undergoing a shift from merely exporting raw materials (for importing countries to

process) to trading high-value live fish or value-added products. Foreign investments have come in for the development of processing plants because of low labor costs. Majority of commodities produced through aquaculture undergo auction procedures, either on-site (farms) or at major trading centers (ports or the local *consignacion*).

### **2.8.6 Natural Resource Pricing**

The commercial fisheries and aquaculture are the two subsectors where resource rents are potentially high, and where correct resource pricing could be exercised. The goal of sustainable development in the fisheries sector can be pursued through the use of market-based instruments. The Fisheries Code recognizes the importance of market-based instruments as a tool in environmental management. For instance, Section 48 of the code stipulates that the DA should formulate incentives and disincentives, such as effluent fees, user fees, negotiable permits and other market-based instruments to encourage compliance to environmental standards and promote sustainable management practices in aquaculture. Charges for access to fishery resources should reflect the community interest, as well as short- and long-term economic, environmental, social, and cultural costs and benefits. Access to common fishing resources for private profit should be priced to give a reasonable rate of return to the community, where consistent with government resources policies.

The correct pricing of fisheries resources by the national government is a useful tool for attaining a more sustainable form of development in fisheries. This is because correct resource pricing, largely done through the imposition of accurate fees that reflect resource rents, or above normal profits, will force users to be more efficient. Hence their activities will produce higher outputs at lower effort levels, thereby reducing overfishing without sacrificing production. In addition to the economic and environmental gains of correct pricing, there are generated revenues from the extraction of rents from users.

The current license fee rates in the commercial fisheries are very low and were set many years ago. For a 250 gross ton (GT) motorized boat, for instance, the annual boat license is only PhP1,000 which was set way back in 1983. In addition, the annual application fee is minimal at PhP400 or PhP2,000 which was determined back in 1993. In the aquaculture subsector, the situation is similar. The rental rates for using government-owned fishponds are minimal and were set several years ago. The annual rental fee per hectare of fishponds is only P50 since 1979, while the annual application fee is PhP1,000 since 1993.

Another prospect of fisheries development is in the area of eco-tourism. This will be closely associated with the establishment of parks and other protected areas. Many popular diving sites have high fisheries biodiversity. Bioprospecting needs also to be explored.

## CHAPTER 3

### *FISHERIES SECTOR DEVELOPMENT FRAMEWORK*

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As the conceptual link between the development issues described in Chapter 2 and the management measures described in Chapter 4, this chapter covers five sections. Section 3.1 (Development Philosophy) covers the pertinent sustainable development concepts, as well as the relevant guiding principles specific to the fisheries sector. The strategic development trends/challenges that include relevant macro global and regional items (eg, globalization and climate change) and fisheries-specific concerns (eg, increasing demand of fishery products and biodiversity) follow. Section 3.3 provides a prognosis for the Philippine sector in terms of the status and benefits; and highlights development scenarios in relation to the various driving forces. Environment- friendly aquaculture is anticipated to accelerate development to supply the deficit for food fish. The strategic vision and mission – over a 20-year period - as well as the goal and objectives of the CNFIDP follow. All these are general towards the sustainability of the Philippine fisheries. Section 3.5 wraps up with the indicative program components and phasing.

### 3.1 Development Philosophy

Sustainable development concepts have guided the crafting of this plan (Box 3.1.a). These serve as conceptual foundation in plan development.

#### **Box 3.1.a Sustainable development concepts.**

1. inter- and intra-generational equity
2. holistic development
3. integrated management
4. carrying capacity

**Inter- and intra-generational equity** pertains to “development that meets the need of the present without compromising the ability of future generations to meet their own needs” (Brundtland Report 1987). The benefits from the use of fishery resources should be shared between the present and future generations of Filipinos, especially among those whose livelihoods are highly dependent on these resources. Short-term economic gains for a few stakeholders should never be the basis for a decision that has adverse consequences for future users. Inter-generational equity requires that future generations be given the same opportunity as the present ones to decide on how to use fishery resources.

**Holistic development** must likewise be promoted. It is neither biocentric nor anthropocentric. A balance is desired among the human and abiotic components. Hence, it must be a development that is ecologically sustainable, socially acceptable and economically feasible (Munasinghe 1993). Such expression is alternatively expressed as social equity, ecosystem sustainability, and economic efficiency.

Another principle, as espoused in Agenda 21, is **integrated management**. It is desirable to provide for an integrated policy and decision-making process, including all sectors involved, to promote compatibility and a balance of resource uses. It is emphasized that in most cases, there are multiple economic uses that occur in the fisheries environments. These include, but not limited to: agriculture, forestry, manufacturing industries, mining, navigation, and tourism. Hence, the need to identify existing and projected uses of fisheries areas and their interactions with the other sectors. Economic, cultural, and environmental aspirations should be evaluated and accommodated through integrated planning and management of fisheries resources.

**Carrying capacity** is another essential development concept. It implies that renewable resources should be exploited only at or below their rates of renewal (Hodge 1995). It also advocates that a particular development to be pursued should be within the carrying capacity of the environment. Such principle is also referred to as development within the limits of acceptable change.

There are also principles that are specific to the fisheries sector (Box 3.1.b). To the extent possible, these principles should be applied to all decisions and actions affecting fisheries development and management. The integrity of the territorial waters being used for fisheries must be maintained, while the benefits derived must be shared equitably among the competing users. Cutting across all these principles is the need to develop contingency plans for the fisheries sector, given its vulnerability to global, regional and national development trends and drivers.

#### **Box 3.1.b Principles for fisheries sector development**

1. precautionary principle
2. ecosystem-based fisheries management
3. participatory management
4. partnership
5. decentralized administration
6. polluter pay principle
7. accountability

A key is the **precautionary principle**. Such approach must be considered in making fundamental decisions about the use of fishery resources. The current overfished and degraded condition of fishery resources in the Philippines requires that a precautionary approach be used in making fundamental decisions about their uses. Decisions about the fisheries – both the natural and the human dimensions - should be planned using the best available scientific and technical information. In the event that such information and data are insufficient to fully characterize risks or negative impacts to the fisheries resources, precautionary measures should be intended to prevent serious or irreversible harm. The higher the risks and uncertainty of unacceptable levels of change or serious damage to the fisheries, the more conservative should be the measures required to reduce or eliminate the risk. The precautionary principle is imbedded in the Code of Conduct for Responsible Fisheries (CCRF) by the Food and Agriculture Organization (FAO) and the Southeast Asian Fisheries Development Center (SEAFDEC).

The principle of **ecosystem-based fisheries management** (EBFM) has been cited in international fora, such as the Conference on Responsible Fisheries in the Marine Ecosystem (2001, Reykjavic) and the ICES/SCOR Symposium on Ecosystem Effects of Fishing (1999, Montpellier). EBFM is defined as “managing fisheries in a manner that addresses multiple needs and desires of society, without jeopardizing options for future generations, to benefit from the full-range of goods and services provided by marine ecosystems” (FAO 2003). This principle is closely allied with precautionary principle and limiting fisheries impacts on the ecosystem.

Another principle relates to **participatory management**. The ultimate goal of sustainable fisheries management can only be achieved effectively through multi-sectoral and multi-institutional collaboration and cooperation. Relevant stakeholders must be given opportunities to actively participate in all aspects of fisheries management. The complex nature of institutional arrangements happening in Philippine fisheries requires the collaboration and cooperation of many institutions at national and local levels. The principle of subsidiarity dictates that the responsibility for resource management be given with the stakeholders at the appropriate level.

There is a need to establish appropriate **partnership** arrangements. For instance is private-public partnership, ie, government and industry collaboration. Included here also are the innovative partnership schemes between the civil society groups and the local communities. Collaborative mechanisms must promote policy harmonization and consistency, information sharing, and collective action to achieve sustainability in fisheries management. Knowledge-based management forms part of information sharing.

Closely related to the above is the philosophy of **decentralized administration**. Such is contained in the 1991 Local Government Code. Direct participation of local fishing communities - including indigenous peoples, women and children - must be incorporated in the identification, formulation, planning and implementation of the respective fisheries plans. Whenever possible, responsibilities and resources for fisheries management must be fully devolved to local level decision-makers who are closest to the resources being managed. Local government units and communities are closest to the issues, problems, and solutions required for effective management. Devolution of responsibilities is essential to rehabilitate and sustain the benefits derived from fisheries resources.

**“Polluter pays” principle** espouses that the cost of environmental control fall in the first place on the polluters. Hence, those who produce negative impact to the fisheries resource and/or environment must undertake the necessary compensatory activities. Particularly for aquaculture, this shall ensure that it uses the resources efficiently, eliminates pollution and reduces wastes. A component of this principle is the establishment of appropriate user-fee system.

**Accountability** means the users must be held accountable for their actions. Municipal and commercial fishers are expected to shun away from the use of destructive fishing gears. Similarly, aquaculturists must promote environment-friendly husbandry techniques. Hence, all stakeholders must be responsible stewards of the fishery resources.

## 3.2 Strategic Development Trends/Challenges

There are key worldwide trends that are impacting on the fisheries (Box 3.2.a). Unlike before, **globalization** is making trade issues more relevant to the fisheries. The 1997 APEC Conference held in Vancouver initiated the process for addressing fisheries trade with a view toward further liberalization. There is on-going removal of tariff for movement of fishery products. Aside from traditional concerns about trade barriers, there are new issues about non-tariff barriers emanating from health and safety criteria. These include the prospects for eco-labeling.

### Box 3.2.a Macro global/regional/national items

1. globalization
2. climate change
3. population growth
4. pollution
5. habitat destruction

**Climate change** affects production in the wild. The condition of small pelagic (oceanic) fishery resources - such as anchovies, sardines and mackerel - is heavily dependent on climatic conditions such as the El Niño phenomenon. About 16 % of the world's corals were destroyed by temperature-induced coral bleaching following the last El Niño. Cephalopod stocks tend to fluctuate in response to environmental conditions. It is predicted that the increasing average sea surface temperatures and year-to-year climate variability in the Western Pacific Ocean would affect the distribution, abundance, and catchability of the tuna fisheries in the region (World Bank 2004). Hence, the global warming and subsequent climatic changes on the ecosystems that support these fisheries are key driving forces that affect the sustainability of the world's fisheries.

**Population growth**, despite negative trends in many developed economies, remains a critical factor. The population living within 100 km of the coast has grown to 2.2 billion people (39 % of the global population), leading to pollution and degradation of major marine ecosystems. In Southeast Asia (SEA), its fisheries-rich coastal zone supports some 380 million people (70% of the population) who live within 60 km of the coast. People also congregate in fisheries-rich inland waters, such as the peripherals of lakes and riverine systems. In the Lower Mekong Basin in mainland Asia alone, around 60 million people inhabit the area. The Philippine's Laguna Lake, the second largest lake in SEA, is home to millions of fisheries-dependent populace. The country's population of some 82 million in 2004 is increasing at a very high rate of 2.36 %. More than a million of them are directly dependent on fisheries.

**Pollution** has been a major contributor to the direct mortality of fish. Aside from constraining the reproductive success, pollutants render the fish more susceptible to diseases. Pollution likewise contributes to the destruction of critical fishery habitats; it is also linked to the advent of harmful algal blooms (HABs). Over 300 HAB events were recorded during the 1990s along China's coastal areas, affecting cage culture and cultivated

mollusks (World Bank 2004). Among the recent initiatives to mitigate pollution is on the management of ships and ballast water.

**Habitat destruction** continues to affect the fisheries sector, thereby impairing the functional integrity of coastal ecosystems. Much of this damage has occurred over the last 30 years in SEA, where 70% of mangroves (UNEP 1998) and more than 20% of seagrasses (Fortes 1994) have been destroyed. In this region, nearly 90% of coral reefs are threatened to varying degrees (Burke et al. 2002). About 98 % of Philippine reefs are at risk from human activities, with 70 % percent at high or very high risk. The country's aquaculture ponds cover about 2,539 km<sup>2</sup>, mostly located in the coastal zone in what were originally mangrove areas (World Bank 2004). From 1918 to 1970, an average of 3,100 ha of mangroves was lost every year, increasing to about 8,200 annually from 1970 to 1988.

There are also global, regional and national drivers that are specific to the fisheries sector (Box 3.2.b). There is a growing consensus that the peak of **global production trend** from capture fisheries has already been reached. Marine fisheries production is either at the limit or already in decline. Global capture fish production increased by 1.1 % per year during 1985–99, and can probably increase by 0.5 % per year until 2020 (World Bank 2004). Such statistical figures, however, must be viewed with caution given that the Chinese fishery statistics might have been overestimated. It is possible then that global catch trends have stagnated over the last decade, and might even have declined (Watson and Pauly 2001).

#### **Box 3.2.b Sector-specific global/regional/national items**

1. global production trend
2. demand for fishery products
3. price for fishery products
4. excess capacity
5. technological advances
6. biodiversity concerns
7. fisheries networks and bodies
8. aquaculture expansion

Overall, there is an increasing global **demand for fishery products**, particularly for high-valued species. The total demand for fish products will increase from 91.3 million tons in 1997 to 127.8 million tons in 2020 (Delgado et al 2003). Worldwide, over the last thirty years, the per capita demand for food fish increased from 10.5 kg/year to almost 16 kg/year. Moreover, there is a shift towards consumption of fresh fish (including live fish). Currently, it accounts for 54 % of global food fish consumption. It is expected that developing countries will continue to export high-value products and import low-value products, specially small pelagics. Based on recent trends and the most realistic stock assessments, it is unlikely that the global demand can be met by the stagnating production of capture inland and marine fisheries.

Corollary with the above, the **price for fishery products** has been increasing. It is one of the few agricultural commodities that has shown a real increase in price over the last

decades. Such rise in price may lead to an increase in insecurity for food fish among poor urban dwellers. Such trend is expected to continue. Real fish prices are estimated to rise by 4 to 16 %, while meat prices will fall 3 % by 2020 (Delgado et al 2003). Fishmeal and fish oil prices would rise by 18 %. Moreover, the use of fishmeal would increasingly be concentrated in aquaculture, particularly of high-value carnivorous species.

**Excess capacity** – also referred to as overcapacity - is the “situation where the capacity output is greater than target output” (Pascoe and Greboval 2003). Regional and distant-water fishing by vessels from developing countries is still expanding. In 1995, East Asia contributed about 78% to global capacity with its some 980,000 decked fishery vessels (PEMSEA 2003). Subsidies to the fisheries sector have been an important driving force in creating the current overcapacity and, subsequently, overfishing. An aggregate level of US \$14 billion to US \$20 billion in annual subsidies was estimated for the sector (Milazzo 1998), whereby roughly half of the reported subsidies potentially lead to overcapacity and overcapitalization. The world’s fishing capacity would have to be reduced by 25 % for revenues to cover operating costs, and by 53 % for revenues to cover total costs (Garcia and Newton 1995).

**Technological advances** in fishing has been spectacular over the last few decades. In numerical terms, the global fishing fleet (1.3 million decked and 2.8 million undecked vessels) has remained relatively stable since its major expansion in the 1980s (World Bank 2004). Technological innovations, however, has maximized catching capacity as characterized by the size and power of the vessels, the selectivity of their gear, the navigation technology and the improving skills of skippers. It has been estimated a 270 % increase in average fishing power between 1965 and 1995, essentially a 9 % average annual growth rate (Garcia and Newton 1995).

**Biodiversity concerns** in fisheries have been highlighted since the International Convention on Biological Diversity (ICBD) in 1992. These include the international listing of fishery resource species as threatened or endangered. Both the International Union for the Conservation of Nature and Natural Resources (IUCN) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) have taken steps to include fishery resource species on list. Commercially important species are now added to the CITES listings, such as the coral reef Napoleon wrasse (*Chelinus undulatus*) and whale shark (*Rhincodon typus*). The ICBD enshrines national sovereignty over biological diversity, including safeguards against negative impacts of fisheries and aquaculture. The most important impacts are in potential restriction of exchange of germplasm for aquaculture and bio-prospecting, attention to bio-safety, especially in the creation and use of genetically modified organisms (FAO 1998). The Philippines is now developing its national bio-safety guidelines.

More **fisheries networks and bodies** are being established. For instance is the World Forum of Fishharvesters and Fishworkers (WFFF). At the regional level, over 35 multilateral or regional fisheries organizations (RFOs) have been established. Such RFOs differ in functions, ranging from consultative and advisory up to those with full powers for management, decision-making and enforcement (World Bank 2004). Some networks are habitat-specific in focus, such as the International Coral Reef Initiative (ICRI). This initiative is now supported by over 60 countries, most of them tropical developing countries for which coral reefs support 15 to 25 % or more of their fishery production.

The **aquaculture sector expansion** is becoming more imminent. The main source of growth has been the aquaculture sector, and such trend will most likely continue. Capture fisheries in both marine and inland waters have practically been maintained or declined. At a growth rate of 13 % per year over the last 20 years in the developing countries, this sector has grown dramatically (World Bank 2004). The percentage of fishmeal consumed by aquaculture has risen dramatically over the last decade (from 10 % of fishmeal in 1988 to an estimated 35 % in 2000), reflecting the growth of aquaculture itself (Delgado et al 2003).

### 3.3 Strategic Sectoral Development Pathway/Scenario/Trajectory

The Philippines has been a fish-eating nation, and therefore, the sustainability of the fish supply for its food security is crucial. As late as 1993, the per capita fish consumption was estimated at 36 kg. The demand<sup>1</sup> for fish in the Philippines is expected to increase to about 4.2 million mt by 2025. The projected increase in domestic demand will be brought about by population growth<sup>2</sup>. The projected food fish demand<sup>3</sup> is 2.9 million mt by 2010 given a population 95 million. By 2025, the estimated population is 134.9 million people. The per capita consumption will remain at 31.4 kg.

The foregoing projections of Philippine fish production are restricted to food fish for human consumption, which is presently 2.7 million mt. The supply of food fish is derived from aquaculture (18.8%, excluding seaweeds) and capture fisheries, which consist of municipal fisheries (39.7%) and commercial fisheries (41.5%). Current municipal fisheries production is at 1.08 million mt (BFAR, 2004) with an average 5-year growth rate of 3.4%. Commercial fisheries is at 1.13 million mt (BFAR, 2004) with an average 5-year growth rate of 4.5%. For aquaculture, average 3-year growth rate is 12.0%<sup>4</sup> with production at 1.7 million mt (BFAR, 2004). **Baseline projection** shows a deficit in food fish in the magnitude of 8.4 million mt (accumulated over 2005-2025) or an annual average of 403,000 t (Figure 3.3.a). The maximum sustainable yield (MSY) for Philippine capture fisheries was estimated at 1.9 million mt (Barut et al 1997). This total consists of 900,000 mt and 300,000 mt of pelagics from shelf and non-shelf areas, respectively, and demersal stock of 700,000 mt in shelf areas. The potential harvestable demersal in non-shelf areas is not well known. Moreover, the harvestable fishery resources beyond the EEZ is likewise unknown. The projected growth rate for capture fisheries is constrained by the estimated MSY of 1.9

<sup>1</sup> The estimate food demand for fish and fish products is computed based on 5-year (2000-2004) average growth of per capita fish food supply as follows:

$$\text{Demand for food fish} = \text{human population} / \text{food fish production}$$

<sup>2</sup> Average population growth is 2.36% (NSO, 2004).

<sup>3</sup> Source: Fisheries, Framework for Policies and Strategies. ADB (2005). For the same time period, China requires 28.0 million mt for its population of 1.4 billion people; Japan needs 9.0 million mt of fish, which ranks highest in terms of per capita fish consumption.

<sup>4</sup> Computed based on 2002-2004 average 3-year growth rate of major aquaculture commodities. Except for shrimp, which registered a 26.4% decline in production for the same period, all other aquaculture commodities increased during the 2002-2004 period. Average growth rate for aquaculture commodities are as follows: seaweeds (16.2%), milkfish (8.6%), tilapia (9.3%), carp (1.9%), marine fish (46.9%), others (3.6%).

million mt, and hence, not biologically sustainable. An increase in effort will not yield additional production in the wild.

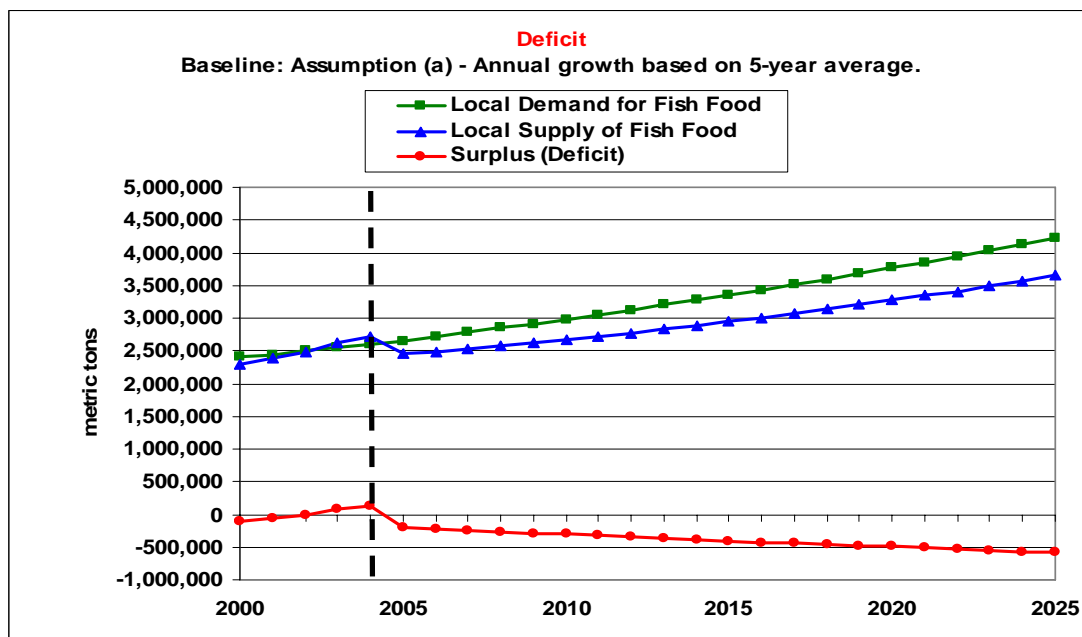
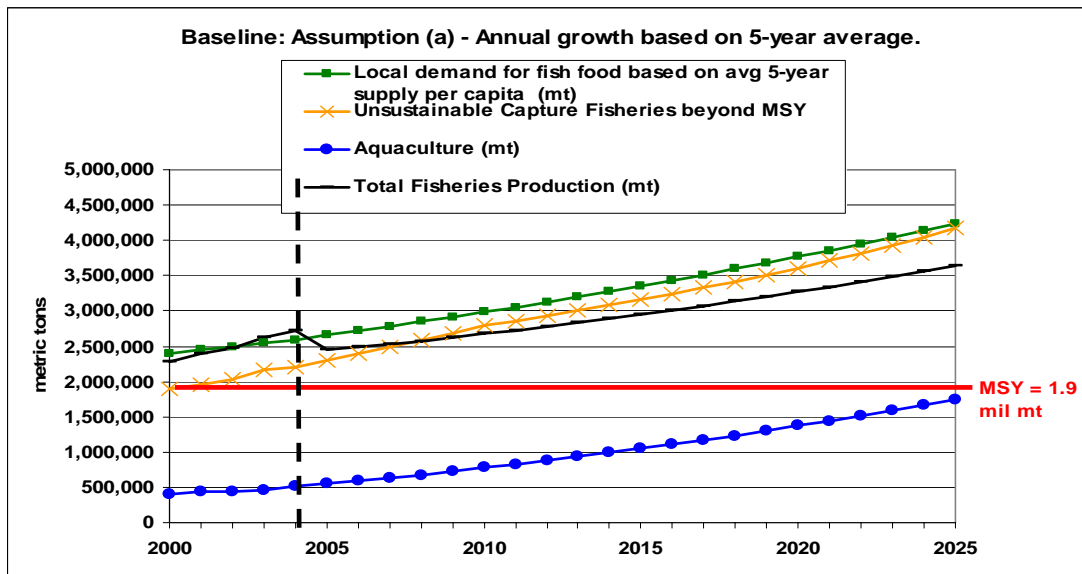
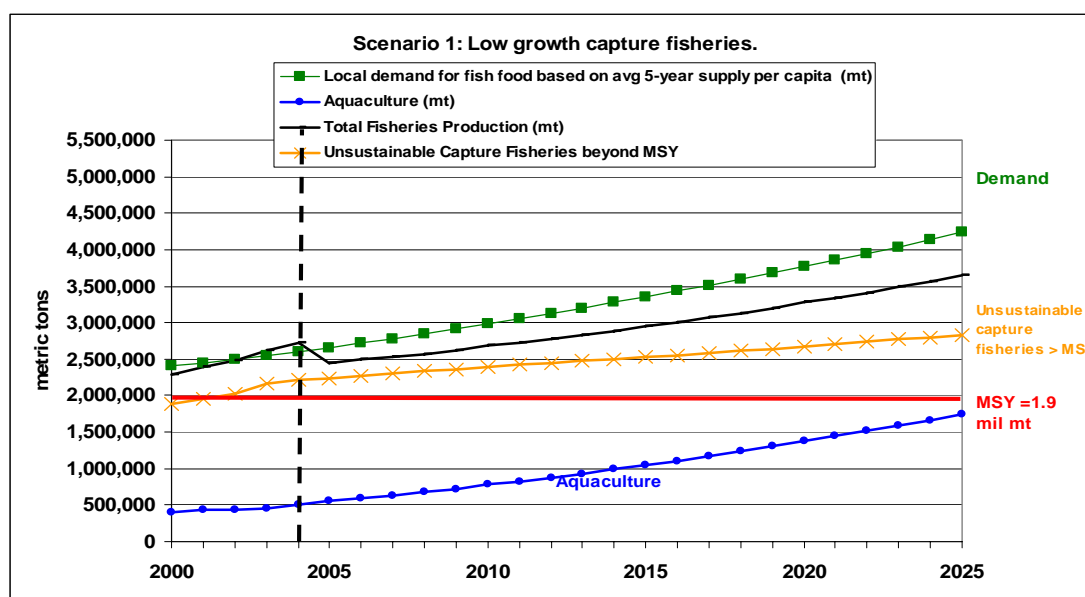


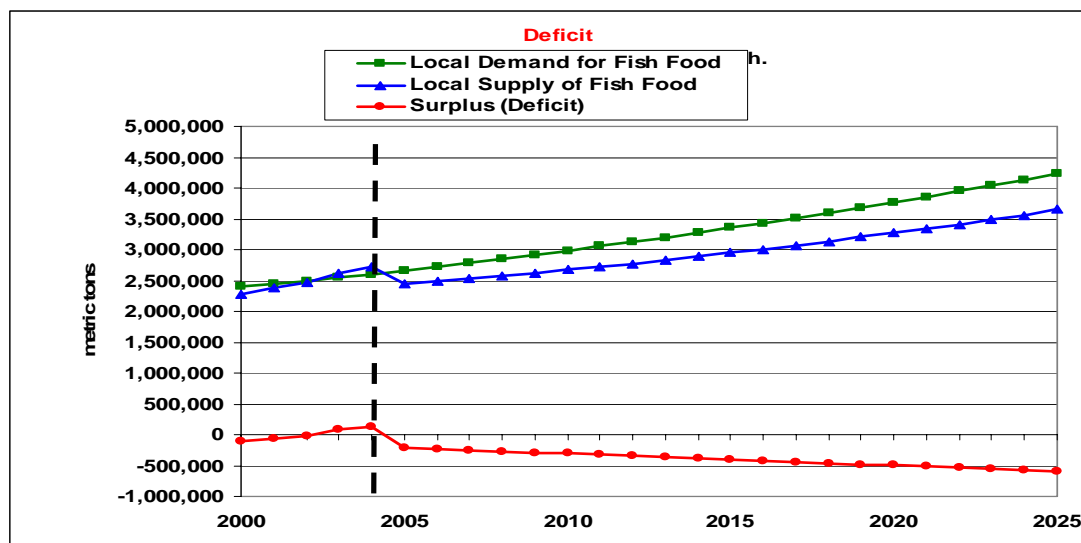
Figure 3.3.a Food fish demand and supply projections based on 5-year average growth (baseline)

Three alternative scenarios relative to the baseline projections are presented: **scenario 1 - low growth** in capture fisheries; **scenario 2 - rationalized fishing** (no growth in capture fisheries); and, **scenario 3 - aquaculture expansion**. Each scenario has its own assumptions. The projections for aquaculture growth are the same from the baseline up to scenario 2. Projections of the national fish production in 2025 range from a low of 3.9 million mt (scenario 2) to a high of 5.8 million mt (scenario 3).

For the low growth scenario<sup>5</sup>, the projection assumes: (1) little improvement in halting overfishing; (2) poor success rates in integrating aquaculture; (3) limited fisheries postharvest development, and (4) continuing habitat/environmental degradation. The municipal and commercial sub-sectors will continue to grow, but at a much lower rate than the baseline. This first scenario assumes unsustainable capture fisheries as production is beyond the MSY of 1.9 million mt. A deficit for food fish is in the magnitude of 8.4 million mt (accumulated over 2005-2025) or an annual average of 404,000 mt (Figure 3.3.b). The baseline and scenario 1 can be compared in terms of volume of unsustainable capture fisheries. The baseline shows that unsustainable capture fisheries ranges from 488,000 to 2.2 million mt, and from 369,000 to 935,000 mt for scenario 1. Hence, it reflects a 32% reduction in unsustainable capture fisheries volume in 2006, and as much as 135 % reduction in 2025.



<sup>5</sup> Based on 0.68% growth for municipal fisheries and 2.88% growth in commercial fisheries (PCAMRD and consultation with experts).



**Figure 3.3.b Food fish demand and supply projections based on low growth capture fisheries (Scenario 1)**

The second scenario represents rationalized fishing effort with harvesting in the capture fisheries not exceeding the MSY of 1.9 million mt. This can be achieved in three ways. First, for municipal fisheries, the 1,080,764 mt production recorded in 2004 will be maintained. Hence, there will be no growth from the start of the 1<sup>st</sup> MTP (2006) until the end of the 4<sup>th</sup> MTP (2025). Secondly, for commercial fisheries, the 2004 production of 1,128,382 mt shall likewise be maintained. Thirdly, the ‘development’ of commercial fisheries<sup>6</sup> will be encouraged in the EEZ and beyond. In 2004, the total capture fisheries production recorded was 2,209,146 mt. It should also be noted that this was already greater than the estimated MSY (1.9 million mt) by a volume of about 309,000 mt. The biomass of 1.9 million mt is already at the upper limit of the MSY. Hence, this excess is speculated to have come from either the demersal stock within the EEZ and/or fish stocks already outside the EEZ waters. Although the effort has already been rationalized, there is deficit in food fish in the magnitude of 960,000 t (accumulated over 2005-2025) or an annual average of 56,500 t (Figure 3.3.c). There will be a surplus in production for the 1<sup>st</sup> MTP (2006-2010). However, there will be deficit from 2011 until 2025, as the population continues to increase while the capture fisheries production is being maintained at the 2004 level.

<sup>6</sup> At least from demersal species up to within the EEZ waters, as well as pelagics and probably demersals beyond EEZ waters.

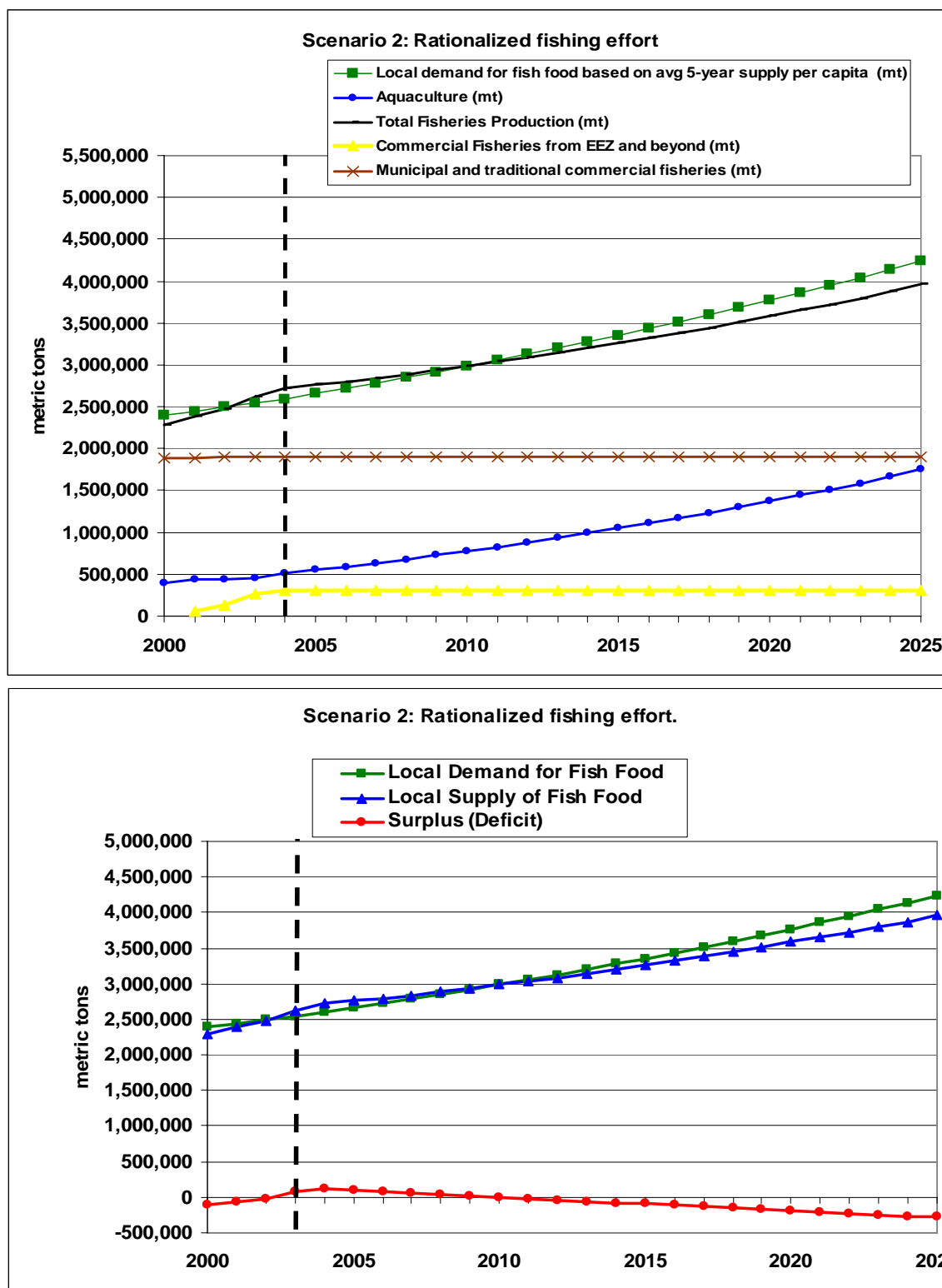
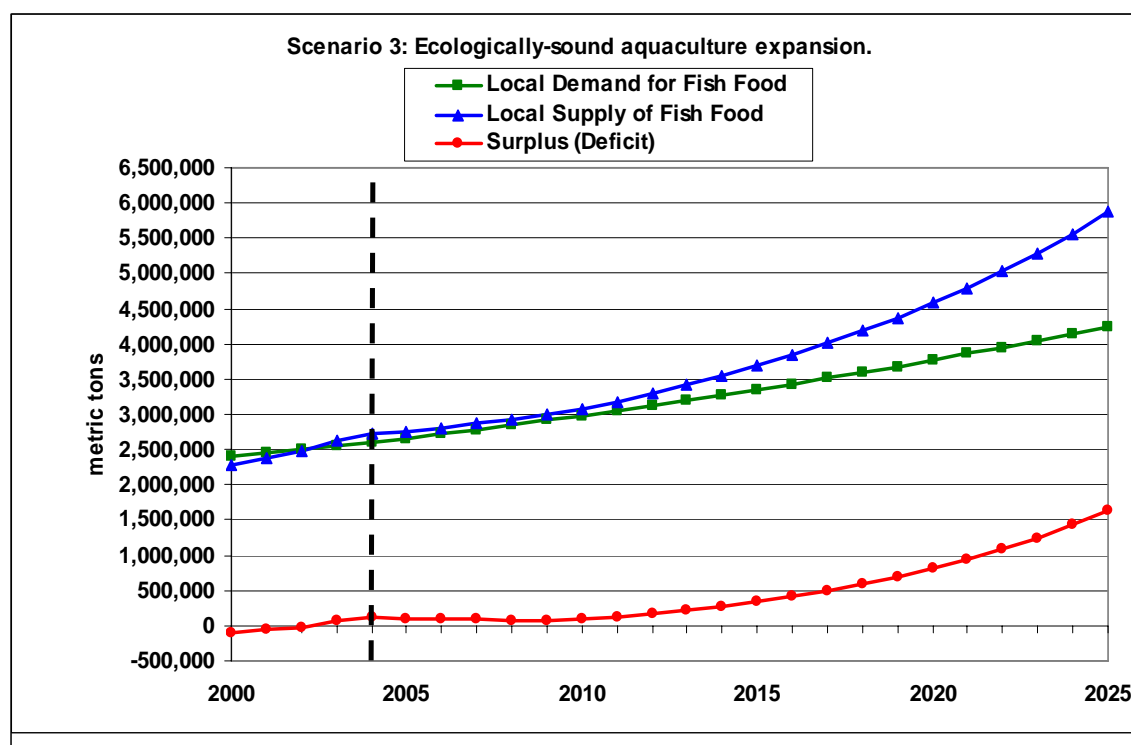


Figure 1.3.c Food fish demand and supply projections with rationalized fishing effort (Scenario 2)

The third alternative represents the ideal/desirable scenario. The higher projection assumes satisfactory progress in the previously mentioned constraints (Figure 3.3.d). These would include: (1) sustainable capture fisheries, by maintaining it at the 2004 levels; and (2)

integration of ecologically sound aquaculture. Aquaculture is assumed to expand<sup>7</sup> to close the domestic fish food demand-supply gap. Hence, there is no more supply deficit even at the onset of 2006. After meeting the national demand for food fish consumption, export volume through the development of responsible aquaculture will be considered. Moreover, this scenario assumes greater reduction in post harvest losses. The projected volume available for export is estimated to range from 91,700 to 1.6 million mt over the 20 year period.



**Figure 3.3.d Food fish demand and supply projections with ecologically sound aquaculture expansion (Scenario 3).**

A summary of the projections in terms of sub-sector volume and percentage contribution to total fisheries production is presented in Table 3.3.a. Recognizing the rising demand for fish in the Philippines, there is a need to support the initiatives to increase the available supply of fish and fish products for human consumption in a sustainable manner. In view of the critical current status of the fishery resources, three strategic thrusts are becoming apparent. First the nationwide rationalization of fishing effort is inevitable. This will be

<sup>7</sup> The aquaculture growth projections are given below:

Species	2006 - 2010	2011 - 2015	2016 - 2020	2021 - 2025
Seaweeds	4.00%	8.00%	10.00%	10.00%
Milkfish	8.50%	8.00%	7.00%	7.00%
Tilapia	9.00%	8.00%	7.00%	7.00%
Shrimp	20.00%	10.00%	8.00%	6.00%
Carp	6.00%	8.00%	10.00%	10.00%
Marine Fish	50.00%	40.00%	30.00%	20.00%
Others	5.00%	5.00%	5.00%	5.00%

accomplished through reduction in fishing to sustainable levels in areas and from stocks currently heavily exploited or overfished. Another mode is to harvest sustainably the high-value species at the higher trophic level. Such activities represent the conservation side of fisheries management. On the development side, the feasibility of commercially exploiting the marine waters in the EEZ (and beyond) will be explored during the 1<sup>st</sup> MTP.

The second thrust is to develop ecologically sound aquaculture, both for food fish and export market. Aquaculture's increasing contribution to overall food security is gaining greater recognition. The third thrust is to make optimum use of harvests and reduce postharvest losses. The current postharvest losses of between 25-40% is not acceptable. The over-all trend then to promote sustainability is the declining/steady contribution of the capture fisheries, the expansion of environment-friendly aquaculture, and further reduction in post-harvest losses.

**Table 3.3.a Summary projections.**

Subsector	Scenario	2004		2010		2015		2020		2023	
		mt	%	mt	%	mt	%	mt	%	mt	%
Municipal fisheries	baseline	1,080,764	39.7%	1,321,363	37.0%	1,321,363	31.4%	1,321,363	26.5%	1,321,363	22.3%
	scenario 1	1,080,764	39.7%	1,125,616	35.4%	1,125,616	31.4%	1,125,616	27.8%	1,125,616	24.5%
	scenario 2	1,080,764	39.7%	1,080,764	36.2%	1,080,764	33.1%	1,080,764	30.1%	1,080,764	27.3%
	scenario 3	1,080,764	39.7%	1,080,764	35.1%	1,080,764	29.2%	1,080,764	23.6%	1,080,764	18.4%
Commercial fisheries	baseline	1,128,382	41.5%	1,470,694	41.2%	1,834,048	43.6%	2,287,174	45.9%	2,852,250	48.2%
	scenario 1	1,128,382	41.5%	1,270,751	40.0%	1,403,001	39.2%	1,549,027	38.2%	1,710,251	37.3%
	scenario 2	1,128,382	41.5%	1,128,382	37.7%	1,125,382	34.6%	1,128,382	31.5%	1,128,382	28.5%
	scenario 3	1,128,382	41.5%	1,128,382	36.7%	1,300,502	35.1%	1,498,876	32.7%	1,727,510	29.4%
Capture fisheries	baseline	2,209,146	81.2%	2,792,057	78.2%	3,155,411	75.0%	3,608,537	72.4%	4,173,613	70.5%
	scenario 1	2,209,146	81.2%	2,396,357	75.4%	2,528,617	70.6%	2,674,642	66.0%	2,835,866	61.9%
	scenario 2	2,209,146	81.2%	2,209,146	73.9%	2,209,146	67.7%	2,209,146	61.6%	2,209,146	55.8%
	scenario 3	2,209,146	81.2%	2,209,146	71.8%	2,381,266	64.3%	2,579,640	56.2%	2,808,274	47.9%
Aquaculture	baseline	512,200	18.8%	780,402	21.8%	1,052,394	25.0%	1,378,441	27.6%	1,749,180	29.5%
	scenario 1	512,200	18.8%	780,402	24.6%	1,052,394	29.4%	1,378,441	34.0%	1,749,180	38.1%
	scenario 2	512,200	18.8%	780,402	26.1%	1,052,394	32.3%	1,378,441	38.4%	1,749,180	44.2%
	scenario 3	512,200	18.8%	865,786	28.2%	1,320,635	35.7%	2,007,516	43.8%	3,060,232	52.1%
Total fisheries	baseline	2,721,346	100.0%	3,572,459	100.0%	4,207,805	100.0%	4,986,978	100.0%	5,922,793	100.0%
	scenario 1	2,721,346	100.0%	3,176,759	100.0%	3,581,011	100.0%	4,053,084	100.0%	4,585,046	100.0%
	scenario 2	2,721,346	100.0%	2,989,548	100.0%	3,261,540	100.0%	3,587,587	100.0%	3,958,326	100.0%
	scenario 3	2,721,346	100.0%	3,074,932	100.0%	3,701,900	100.0%	4,587,156	100.0%	5,868,505	100.0%

## **3.4 Strategic Vision, Mission, Goal/s and Objectives**

### **3.4.1 Development Vision and Mission**

The vision for the Philippine fisheries sector is essentially a description of the ideal setting or situation in the future. A vision is a statement of what the sector desires to see happening over the long-term, which in this case is 20 years. It represents the shared view, understanding or wish of all the relevant stakeholders. During the various consultations and visioning exercise, a provisional vision statement was formulated for the sector as follows:

*“A sustainable and competitive fisheries industry that contributes to food security and provides optimum socio-economic benefits to Filipinos”*

In this regard, a corresponding mission statement was drafted. A mission may be visualized as sort of a ‘bridge’ to attaining the vision. It is a statement of how vision will be achieved, and is often institutional/organizational in context. A draft mission statement is given below:

*“To build effective multi-sectoral collaboration and partnership arrangements that empower communities and other stakeholders for responsible stewardship of Philippine fisheries resources and ecosystems”*

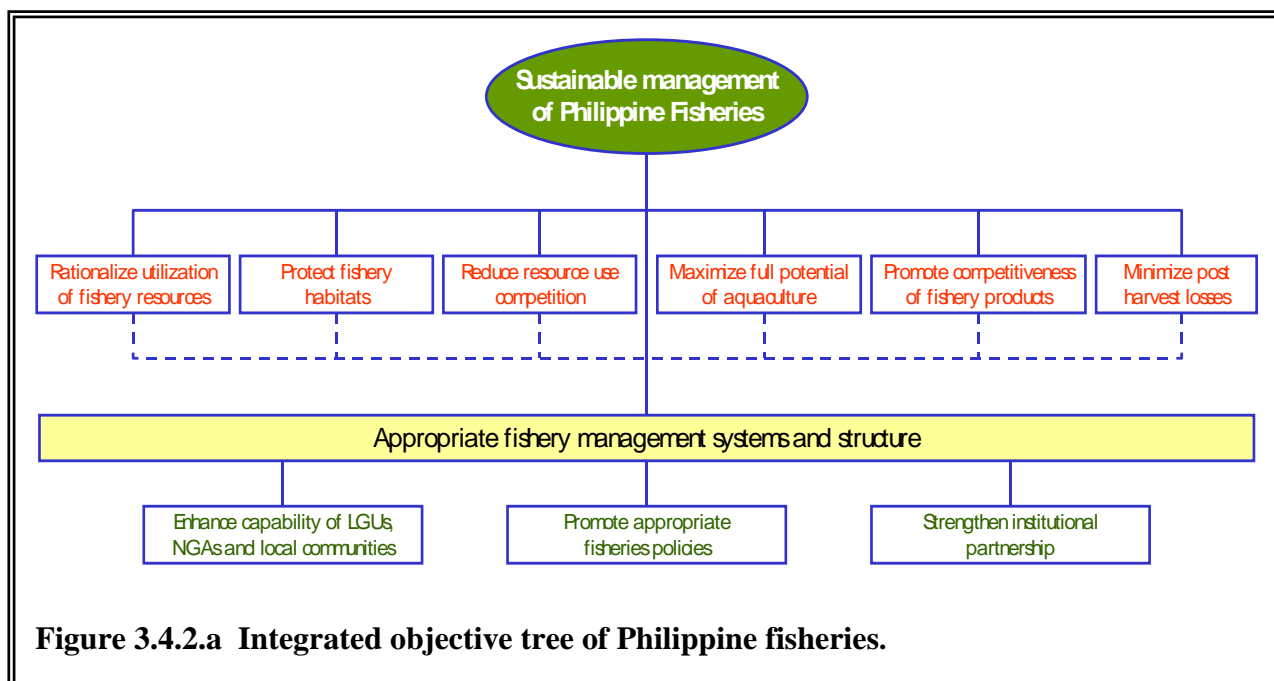
The CNFIDP’s strategic thrusts, goal and objectives, as well as the corresponding programs and projects, are anchored on the above vision and mission statements.

### **3.4.2 Goals and Objectives**

The CNFIDP’s goal over the long-term is to sustain the industry’s socio-economic benefits without jeopardizing the fishery resources and the associated habitats in the most administratively efficient and cost-effective manner. There are nine associated strategic objectives for the fisheries sector (Fig 3.4.2.a). The nine objectives correspond to the nine key problems depicted in Chapter 2’s integrated problem tree. The attainment of these objectives will lead to the attainment of sustainable management of Philippine fisheries.

The objective to ‘rationalize utilization of fishery resources’ is largely conservation in context. The conservation emphasis entails the harvesting of the fishery resources within the sustainable level. Such is aligned with ecosystem-based management principle. A core thrust of this objective is to limit entry through appropriate licensing scheme.

The objective to ‘protect fishery habitats’ is ecological in focus. This requires the protection of the critical habitats, both inland and marine, as the health of the fishery resources is dependent upon them. Fishing methods must not inflict negative impacts to the environment. These include the adoption of environment-friendly aquaculture techniques. Hence, pollution must be minimized, as it affects fisheries production.



**Figure 3.4.2.a Integrated objective tree of Philippine fisheries.**

The objective to ‘reduce resource use competition’ is linked with an effective zoning. Fishers may compete among themselves, such as between municipal and commercial groups. They may also compete with other users of fisheries habitats/resources; for instance, municipal fishers versus eco-tourism operators. Hence, some issues here are outside the fisheries sector. As a traditional fishing community develops, more multiple-use conflicts happen.

The objective to ‘maximize full potential of aquaculture and commercial fishing’ is largely development in context. It is a recognition that aquaculture will fulfill an increasingly greater role. Problems like poor quality seed stock, high production costs and conflict of aquaculture with other resource uses need to be addressed. Another development area pertains to the expansion of fisheries in underutilized fishing grounds, particularly possible fisheries development in Exclusive Economic Zone (EEZ) waters.

The objective to ‘promote competitiveness of fishery products’ acknowledges that many of our fisheries products are not globally-competitive. Many goods do not pass the health and safety standards of developed nations. Problems like poor product quality and high production costs need to be addressed. These include weak marketing strategies.

The objective to ‘minimize post harvest losses’ aims to address the post harvest losses in the Philippines, ranging from 25-30 %. Such loss is in terms of economic value and/or physical quantity. Issues to be addressed range from limited infrastructure facilities up to lack of technological know how.

The objective to ‘enhance capability of Local Government Units (LGUs), Non-Government Agencies (NGAs) and local communities’ is largely institutional in context. Many agencies - from local to national – are not fully equipped to handle the full range of fisheries management functions. Among others, such organizations are besotted by limited funding, inadequate human resources and low priority given to fisheries.

The objective to ‘promote appropriate fisheries policies’ focuses on the legal regime. There is a need to address the overlaps in policies, rules and regulations, as well as inconsistent implementation of national policies and laws. There has been limited scientific basis for enacting fisheries laws. This objective likewise recognizes the significance of traditional and/or customary laws.

The objective to ‘strengthen institutional partnership’ aims to strengthen various types of partnerships. It may involve partnership between the government and industry, as well as between local fishing communities and civil society groups. There has been limited coordination among concerned agencies/stakeholders.

### 3.5 Strategic Development Program Components and Indicative Phasing

Over the 20-year period of the CNFIDP, four medium-term plans (MTPs) shall be developed (Table 3.5.a).

**Table 3.5.a Medium-term plans (MTPs) under the CNFIDP.**

	<b>1st MTP</b>	<b>2nd MTP</b>	<b>3rd MTP</b>	<b>4th MTP</b>
Year	(2006-2010)	(2011-2015)	(2016-2020)	(2020-2025)
Indicative Theme	“Strengthening the foundation for sustainable growth”	“Building on the aquaculture gains”	“Towards increasing globe competitiveness of Philippine Fisheries”	“Maintaining the benefits of a sustainable industry.”

The 1<sup>st</sup> medium term plan or MTP (2006-2010), which is the most crucial, will strengthen the existing foundation of fisheries management. The specific project interventions are provided in Chapter 4. These programs relate to the improvement of the following five sub-sectors: (1) development and management for sustainable commercial fisheries, (2) sustainability and equity for municipal fisheries, (3) increase the contribution of the aquaculture industry to national development, (4) comprehensive program on product safety and quality systems and a systemic approach to marketing for post-harvest, and institutional development and policy support.

The first MTP recognizes that expansion for capture of municipal fisheries will be very limited. There is particularly true for the municipal sub-sector. As part of effort rationalization, the profitability of exploiting the offshore fishery resources within EEZ and beyond shall be studied within the 1<sup>st</sup> MTP period. If the result is positive, then the necessary ‘re-tooling’ of commercial fleets shall be undertaken. If the result is negative, then the deficit for national food requirements and/or exports shall be taken from gains in aquaculture. Gains may likewise come from the reduction in post-harvest losses. At the end of this first MTP, a comprehensive evaluation of the plan shall be undertaken based on the agreed indicators.

For the 2<sup>nd</sup> MTP (2011-2015), national security for food fish shall have been attained. It is expected that the aquaculture will play greater role. More high-valued species will be given emphasis. More fishery habitats are either protected or rehabilitated within this period. Further, post-harvest losses would have been substantially reduced. For the 3<sup>rd</sup> MTP (2016-2020), increasing global competitiveness of Philippine fisheries products is anticipated. The 4<sup>th</sup> MTP (2021-2025) is envisioned to maintain the benefit of a sustainable industry. All the MTPs will be assessed progressively.

This chapter provides the conceptual foundation and strategic direction of the CNFIDP. Section 3.1 covers the pertinent sustainable development concepts, as well as the relevant guiding principles specific to the fisheries sector; Section 3.2 describes the strategic development trends/challenges that include relevant macro global and regional items (e.g., globalization and climate change) and fisheries-specific concerns (e.g., increasing demand of fishery products and biodiversity); Section 3.3 provides a prognosis for the Philippine sector in terms of the status and benefits; development scenarios in relation to the various driving forces are highlighted; Section 3.4 highlights the strategic vision and mission – over the 20-year period - as well as the goal and objectives follow; Section 3.5 wraps up with the indicative program components and indicative phasing, emphasizing on the first medium-term (2006-2010). The next Chapter describes the medium-term programs and projects, as priority management measures to the development issues described in Chapter 2.

## **CHAPTER 4**

### ***MEDIUM-TERM PRIORITY PROGRAMS AND PROJECTS***

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This chapter tackles the proposed specific measures and/or interventions to address the various management problems and issues identified over the first five years (2006-2010). In effect, this chapter provides the five-year action plan. Section 4.1 summarizes the total of 35 priority projects. Each project (described briefly in 11-point elements) has an implementation period of between one to five years. Sections 4.2 through 4.6 describe the individual projects for these five sub-sectors: (1) eight for municipal capture fisheries, (2) five for commercial capture fisheries, (3) nine for aquaculture, (4) seven for post harvest, and (5) six for institutional. The total budget for these medium term is PhP 1,638.13 million. On the average, the estimated annual cost of the plan is PhP 324.1 million.

#### **4.1 Overview of Sub-sector and Projects**

This chapter describes the priority (medium-term) projects to be implemented within 2006-2010. Such constitute the ‘action elements’ of the plan in response to the identified fisheries management issues/problems and opportunities in Chapter 2, as well as the CNFIDP objectives described in Chapter 3.

By design, each sub-sector is composed of several projects. Every project is presented in a project brief and/or concept proposal format. As a stand-alone document, a project brief consists of 11 points/elements that are described below:

- 1) Project Title:
  - Distinctive name given to the project that describes the scope of work in specific, clear and concise manner
- 2) Site/coverage:
  - Geographical location
- 3) Rationale/Background:
  - Overview that describes the specific problems, needs or opportunities to be addressed by the project
- 4) Goal/objectives:
  - What the project plans to accomplish or the outcomes which the project intends to achieve/bring about (Goal is an ideal expressed often in abstract terms, while an objective is specific in terms of what will be accomplished); may be expressed in terms of targets or objectively verifiable indicators
- 5) Key activities:
  - Describe the different sets (components) of actions and activities to be carried out (including key outputs, if applicable)



- 6) Schedule of activities:
  - Specify the sequence of activities in time; time frame is for maximum of 5 years (medium-term reference) with 2006 as the base year
- 7) Organization and management:
  - Identify all organizations/institutions to be involved; describe the management structures and functional relationship of all parties
- 8) Performance tracking:
  - Describe the evaluation mechanism by which the progress of the project will be measured; include who and how will the project's impacts/effects will be evaluated
- 9) Budget requirement:
  - Estimate the project cost (in PhP) in terms of: (1) personnel, (2) MOOE, and (3) capital outlay
- 10) Funding source:
  - Specify possible source of fund, e.g., national government, loan, grant, etc
- 11) Risks/assumptions:
  - Risks, uncertainties, assumptions

The rationale behind the 11-point format is to make the preparation of detailed project proposals at a later stage more manageable. The project brief already provides some substantive content. Once the entire CNFIDP has been approved, operational planning shall commence. Hence, the project briefs will be transformed into implementable and appropriately-costed activities either by regions or specific geographical locations. A summary list of projects, by program and sub-sector is given in Table 4.1.a.

**Table 4.1.a Summary of projects by sub-sector.**

Projects	Municipal Fisheries	Commercial Fisheries	Aquaculture	Postharvest	Institutional	Cross-cutting Programs
Project 1	Comprehensive Education Program for FARMC Fisherfolk Representatives	Rationalization of Fishing Effort in Overfished Commercial Fishing Areas	Advocate a Focused, United, and Strategic Vision and Road Map for the Industry	Strengthening of the Fish Inspection System in the Philippines	Improving the Policy and Regulatory Framework for Fisheries	
Project 2	Institutionalization of Preferential Use Rights through Municipal Fisheries Registration and Licensing	Development and Implementation of a Monitoring, Control and Surveillance (MCS) System for Commercial Fisheries	Enhance RD & E Programs and Prioritize according to Immediate Needs of the Industry	Development of National Quality Standards for Fish and Fishery Products	Building the Institutional Capacity of BFAR	
Project 3	Enhancement of Locally Managed Marine Areas	Development, Adaptation, and Promotion of Selective Environmentally-Friendly and Cost-Effective Fishing Gear and Practices	Strengthen the Local hatchery Industry	Marketing and Promotion of Philippine Fish and other Aquatic Products	Fisheries Management Capacity through Partnerships	
Project 4	Rehabilitation and Regeneration of Coastal Ecosystems	Exploratory Fishing in EEZ and Beyond, and in Under-Exploited Commercial Fishing Grounds	Developing Domestic Supply Chain and Expanding Export Markets for Aquaculture Products	The Development of New Value Added Fishery Products	Networks of Local Fisherfolks and Aquaculture Communities	
Project 5	Sustainable Fisheries Livelihoods Support	Biology and Culture of the Pacific Bluefin Tuna ( <i>Thunnus orientalis</i> )	Institutionalize Best Aquaculture Practices (BAP)	Natural Marine Products	Alliance for the Integrated Co-Management of Ecosystems	
Project 6	Infrastructure and Postharvest Facilities Development for Municipal Fisheries		Establish Standards for Quality and Implement Farm-Based HACCP	Reduction of Fisheries Post harvest Losses	Upgrading Business Sector Capability	
Project 7	Fishery Law Enforcement Enhancement		Rationalize Policies on the Introduction of Live Aquatic Organisms	"Model Villages for Philippine Fisheries Post-Harvest"		
Project 8	Rationalization of Municipal Fishing Effort		Promote Agriculture Development through Special Economic Zones			
Project 9			Empower Small Holders and Fisheries in Aquaculture			

## 4.2 Municipal Capture Fisheries Sub-Sector

### **Problem/Issue Context:**

The key issue in the municipal fisheries sector is pervasive poverty. This is largely brought about by the continuing depletion of the fishery resources. In turn, major factors contribute to resource depletion. One is overfishing due to increasing number of entrants and open access nature of the resource. Two is the degradation of fishery habitats, such as conversion of mangroves, seagrass beds and coral reefs into other economic uses. Destructive fishing techniques contribute to both overfishing and habitat degradation. Resource use conflicts among various fisher groups and with other economic sector likewise contribute to resource depletion. The institutional factors that contribute to the core problem include limited management capacity of LGUs, inadequate infrastructure support and weak law enforcement. Moreover, the slow development of municipal fisheries (as manifested by inadequate infrastructure support, lack of market and limited livelihood opportunities) exacerbate the problem. The eight projects described below - singly or collectively – are directed to address the above problems. These project interventions shall promote the sustainable and equitable utilization on municipal fisheries resources for the benefit of small scale fishers and coastal communities.

### **Project No. 1**

**Title: Comprehensive Education Program for FARMC Fisherfolk Representatives**

### **Site/Coverage:**

Selected areas from among former Fisheries Resources Management Project (FRMP) project sites and other crucial fishing areas including: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Illana Bay and Davao Gulf.

### **Rationale/Background:**

Fisheries and Aquatic Resource Management Councils (FARMCs) are composed largely by fisher representatives from the municipal sub-sector. However, many of these representatives still lack the necessary knowledge and basic administration skills. Hence, they need capability building assistance to help them maximize their participation in fisheries management. This project seeks to improve the quality of their participation. This is premised on assertion that the dynamism of the FARMC system is the cornerstone of effective public participation of fishers in municipal fisheries development.

**Goal/Objectives:**

The goal is develop a comprehensive education program for fisher representatives in FARMCs. The specific aim is to develop the capacity of FARMC on sustainable fisheries management, cooperatives development and sustainable livelihoods

**Key Activities:**

There are five activities, all of which will start in the first year of the plan. One is the inventory of current FARMC capacities. This would include a documentation of the best practices. Two is the conduct of a nationwide training needs analysis (TNA) for FARMCs. Such needs would vary among locations. The third activity is to upgrade the training modules on sustainable fisheries management, cooperatives development and sustainable livelihoods. Fourthly is the conduct of national FARMC trainer's training. Then, the conduct of provincial and municipal level FARMC trainings will follow. This fifth activity shall be conducted by the trainers within the next three years.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Inventory of current FARMC capacities and best practices																					
Conduct of a nationwide training needs analysis for FARMCs																					
Upgrade relevant training modules																					
Conduct of national FARMC trainer's training																					
Conduct of provincial and municipal level FARMC trainings																					

**Organization and Management:**

The Department of Agriculture – Bureau of Fisheries and Aquatic Resources (DA – BFAR) will be directly responsible for project implementation. Concerned units and/or project management teams within the institution shall be tasked with the day to day operations of the project. The FARMC Operations Center shall be assigned specific tasks and responsibilities as may be determined by BFAR. Suitable training institutions may be involved.

**Performance Tracking:**

Monitoring and evaluation shall be done through prescribed processes and procedures within BFAR in collaboration and coordination with the FARMC System. Appropriate performance indicators shall be developed. Consultants and experts shall be contracted at key junctures during project implementation.

**Budget Requirement:**

Item	Amount (in PhP)
Inventory of current FARMC capacities and best practices	300,000
Conduct of a nationwide TNA for FARMCs	500,000
Upgrade training modules on sustainable fisheries management, cooperatives development and sustainable livelihoods	500,000
Conduct of national FARMC trainor's training	300,000
Conduct of provincial and municipal level FARMC trainings	5,000,000
<b>TOTAL</b>	<b>6,600,000</b>

The total project cost covers both the personnel cost and the MOOE.

**Funding Source:**

The main source shall be the regular budget of BFAR subsidized by the national government. Apart from this, funds for project activities can also accessed by developing modularized proposals for submission to multilateral and bilateral aid agencies that provide grants/loans for the development of local governance mechanisms.

**Risks/Assumptions:**

1. Funds for training will be made available, either from the government or external sources
2. There are adequate trainors to conduct nationwide training

**Project No. 2**

**Title:** Institutionalization of Preferential Use Rights through Municipal Fisheries Registration and Licensing

**Site/coverage:**

Selected areas from among former FRMP project sites and other crucial fishing areas including: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Iligan Bay; Illana Bay and Davao Gulf.

**Rationale/Background:**

The crucial issue of open access has been pervasive in municipal fisheries. Hence, the necessity to significantly reduce fishing effort especially in degraded fishing grounds. There is need to balance social goals on one hand, and environmental goals on the other hand. Nevertheless, the project shall adopt a clear bias in favor of politically- and

economically- marginalized municipal fishers. This bias shall be manifest in some management measures, such as the initiation of comprehensive consultation processes and mechanisms, and staggered or graduated implementation of licensing programs in areas where a significant portion of municipal fisherfolk population will be dislocated.

**Goal/Objectives:**

Broadly, this project seeks to address the crucial issue of open access. The specific objective is to work towards the broad recognition of preferential rights of municipal fishers over coastal and marine resources through establishment of appropriate models.

**Key Activities:**

There are two key overlapping activities over the first three years. First is the conduct of nationwide registration campaign. This task shall produce a social and technical inventory of the current state of municipal fisheries. The second activity is to develop models for community property rights systems. Various management mechanisms shall be explored, including community-based licensing systems. This project is also aligned and/or related with the current initiative for a licensing system in the municipal sector.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct of nationwide registration campaign	■	■	■	■	■	■	■	■												
Develop models for community property rights systems					■	■	■	■	■	■	■	■								

**Organization and Management:**

The project shall be a joint undertaking of specific LGUs and the Department of Agriculture – Bureau of Fisheries and Aquatic Resources (DA–BFAR). Within BFAR, concerned units and/or project management teams shall be tasked with the collaboration with and provision of technical support to concerned LGUs. There will also be coordination with the FARMC system from the local to the national level.

**Performance Tracking:**

Monitoring and evaluation shall be done through prescribed processes and procedures within BFAR in coordination with the FARMC System and the concerned LGUs. Consultants and experts shall be contracted at key junctures during project implementation. Among the key indicators to be monitored are the registration database and the models for community property rights systems.

**Budget Requirement:**

Item	Amount (in PhP)
Conduct of nationwide registration campaign to produce a social and technical inventory of the current state of municipal fisheries	2,000,000
Develop models for community property rights systems through various mechanisms including community-based licensing systems	3,000,000
<b>TOTAL</b>	<b>5,000,000</b>

The total budget includes cost for personnel and MOOE.

**Funding Source:**

Several funding sources are possible. One is from the regular budget of BFAR. Two, funds for project activities can also be accessed from the internal revenue allocation (IRA) of the concerned LGUs as their investment in licensing local systems from can generate additional revenue later.

**Risks/Assumptions:**

1. LGUs are willing to provide funding in developing the licensing system and models for property rights

**Project No. 3**

**Title: Enhancement of Locally Managed Marine Areas**

**Site/coverage:**

Selected areas from among former FRMP project sites and other crucial fishing areas including: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Iligan Bay; Illana Bay and Davao Gulf.

**Rationale/Background:**

There are more proofs coming from both fisheries scientists and fishers that locally managed marine areas have been effective in regenerating fisheries productivity, improving the status of fish stocks and protecting critical fish habitats. These happen in coralline, mangrove or seagrass ecosystems, Even with their increasing adoption as a management tool, there remains a need to enhance these marine areas to demonstrate their long term viability and encourage their further adoption by other communities.

**Goal/Objectives:**

The broad aim is to understand better the role of locally managed marine areas in fisheries conservation. The specific objective is to enhance locally managed marine areas at specific demonstration sites.

**Key Activities:**

There are five key interlinked activities. One is the review of success stories and best practices of locally managed marine areas. Two is the identification of model areas for enhancement initiatives. This may include the identification of priority gears and/or species to be managed by the local fishers. Three is the participatory workshops with fishers for capacity building and skill sharing. These first three activities may be undertaken parallel to each other. Fourth is the design and dissemination of information, education and communication (IEC) materials in popular forms for first generation areas. Fifth is to institutionalize support program for the establishment of new locally management marine areas.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Review of success stories and best practices																				
Identification of model areas for enhancement initiatives																				
Participatory workshops with fishers																				
Design and dissemination of IEC materials																				
Institutionalize support program																				

**Organization and Management:**

The project shall be a joint undertaking of the Department of Agriculture – Bureau of Fisheries and Aquatic Resources (DA – BFAR) and the Department of Environment and Natural Resources. Within DA-BFAR and DENR, concerned units and/or project management teams shall be tasked with the collaboration with and provision of technical support to concerned LGUs. There will also be coordination with the FARMC system from the local to the national level.

**Performance Tracking:**

Monitoring and evaluation shall be done through prescribed processes and procedures within DA-BFAR and DENR. There will also be consultation and coordination with the FARMC System and the concerned local government units. Consultants and experts shall also be contracted at key junctures during project implementation.

**Budget Requirement:**

Item	Amount (in PhP)
Review of success stories and best practices of locally managed marine areas	500,000
Identification of model areas for enhancement initiatives	250,000
Participatory workshops with fisherfolk for capacity building and skill sharing	1,000,000
Design and dissemination of information, education and communication materials in popular forms for first generation areas	1,500,000
Support program for the establishment of new locally management marine areas	3,000,000
<b>TOTAL</b>	<b>6,250,000</b>

The total budget includes cost for personnel and MOOE.

**Funding Source:**

Funding may be availed from the regular budget of DA – BFAR and DENR. Additional funds for project activities can also accessed by developing modularized proposals for submission to multilateral and bilateral aid agencies that provide grants/loans for the development of local governance mechanisms. Other financing options that can defray part of the cost for maintaining and expanding locally managed marine areas include user fees, emission/effluent taxes areas, and funds (regular donations/endowments) from corporate social responsibility (CSR) practitioners.

**Risks/Assumptions:**

- 1) Funding not available from identified NGAs
- 2) Local politicians and/or communities do not actively participate

**Project No. 4**

**Title: Rehabilitation and Regeneration of Coastal Ecosystems**

**Site/coverage:**

Selected areas from among former FRMP project sites and other crucial fishing areas including: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Iligan Bay; Illana Bay and Davao Gulf.

**Rationale/Background:**

The current degraded state of many nearshore fishing grounds and coastal ecosystems makes the realization of sustainable municipal fisheries more difficult. The vicious cycle of poverty and resource degradation impels some municipal fishers to resort to destructive fishing methods in an attempt to increase their catch and income. Such result then in unwarranted degradation of vital fishery habitats. Thus, rehabilitation of such habitats are critical to sustainable fish stocks over the long term.

**Goal/Objectives:**

The goal is to facilitate the rehabilitation of critical ecosystems under stress. The specific objective is to rehabilitate selected coral reef, mangrove and seagrass areas.

**Key Activities:**

Four key activities shall be undertaken. One is to update baseline information on critical coastal ecosystems. Mapping will be done to identify high priority areas. Next is the conduct of visioning/scoping exercises with the concerned stakeholders. These would include but not limited to LGUs, line agencies, fisherfolk organizations and research agencies. Third is the design of site-specific coastal rehabilitation and regeneration activities. Such may take the forms of mangrove reforestation and coral reef transplanting. Fourth is the continuous monitoring and periodic evaluation of regeneration and rehabilitation activities. All these tasks will start in year 2006.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Update baseline information on critical ecosystems																				
Conduct Visioning/scoping exercises with key stakeholders																				
Design of coastal rehabilitation and regeneration activities																				
Undertake continuous monitoring and periodic evaluation																				

**Organization and Management:**

The project shall be a joint undertaking of the (DA-BFAR) and the DENR. Appropriate units within these two agencies will be identified later. Suitable research agencies and/or academic institutions will be involved in the research aspects. There will also be coordination with the FARMC system from the local to the national level.

**Performance Tracking:**

Monitoring and evaluation shall be done through prescribed processes and procedures within DA-BFAR and DENR. There will also be consultation and coordination with the FARMC System and the concerned LGUs. Consultants and experts shall also be contracted at key junctures during project implementation.

**Budget Requirement:**

Item	Amount (in PhP)
Update mapping and baseline information on critical ecosystems to identify high priority areas	1,000,000
Visioning/scoping exercises with concerned local governments, line agencies, fisherfolk organizations and other key stakeholders	1,000,000
Design of site-specific plans and projects on mangrove reforestation, deployment of artificial reefs and related initiatives	2,000,000
Continuous monitoring and periodic evaluation of regeneration and rehabilitation of plans and projects	500,000
<b>TOTAL</b>	<b>4,500,000</b>

The above total include the costs for capital outlay, personnel and MOOE.

**Funding Source:**

Apart from the regular budgets of the DA-BFAR and DENR, funds for project activities can also accessed by developing modularized proposals for submission to multilateral and bilateral aid agencies. Assistance of foreign academic institutions may be sought.

**Risks/Assumptions:**

- 1) Concerned agencies are not willing to share information concerning the status of coastal habitats
- 2) Academicians and researchers may not actively participate in the research/study components

**Project No. 5**

**Title: Sustainable Fisheries Livelihoods Support**

**Site/coverage:**

Selected areas from among former FRMP project sites and other crucial fishing areas including: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Iligan Bay; Illana Bay and Davao Gulf.

**Rationale/Background:**

The livelihood of fishers and members of coastal communities are highly dependent on the status of fishery and other coastal resources. Hence, resource management efforts must necessarily include a livelihood development component. This is especially true in situations where effort reduction and closure of certain portions of the concerned fishing ground are imperative. However, livelihood development may be even more necessary even if fisheries is effectively managed. Since the population growth rate of more than 2.3% is not well managed, the demand for food fish continues to increase. Thus, sustainable livelihood development should ideally consist of an appropriate mix of resource-based and non-resource based initiatives.

**Goal/Objectives:**

The goal is to increase the income of small-scale fishers and their families. Specifically, it aims to establish resource based and non-resource based livelihood programs.

**Key Activities:**

There are seven major tasks. One is the conduct of research on livelihood potentials, including the review of existing ones. Emphasis shall be given to livelihood options based on coastal and marine areas and ecosystems. Two is the conduct of trainings on the various aspects of the preferred livelihood projects. Three is the provision of technical support on skills enhancement, technology and resource management, as well as commodity marketing and trade. Fourth is the design and implementation of a marketing program for value-added fishery products and services for both local and distant markets. These first four activities will be done in year 1.

Fifth is the improvement of fishery products and services through R&D. Such shall include the establishment of relevant partnerships schemes between the private sector and the government. Sixth is the enhancement of capital mobilization through credit programs and accessing of soft loans. Seventh is the development and installation of a community-friendly market information system. The last three activities shall commence at the end of year 2.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct of research on livelihood potentials																				
Conduct of trainings																				
Provision of technical support																				
Design and implementation of a marketing program																				
Improvement of fishery products and services through R & D																				
Enhancement of capital mobilization																				
Development and installation of a market information system																				

**Organization and Management:**

The DA–BFAR will be directly responsible for project implementation with concerned units and/or project management teams to be tasked with the day to day operations of the project. Inter-agency mechanisms may be established to facilitate coordination with other line agencies such as DTI and DOF, and government financing institutions such as LBP and Quedancor.

**Performance Tracking:**

Monitoring shall be done through prescribed processes and procedures within BFAR in collaboration and coordination with other line agencies and government financing institutions. Relevant performance indicators shall be developed, and be consequently used to track the progress of project implementation.

**Budget Requirement:**

Item	Amount (in PhP)
Conduct of research on livelihood potentials with emphasis on coastal and marine areas and ecosystems	1,000,000
Conduct of trainings on context-specific livelihood project management	2,000,000
Provision of technical support on skills enhancement, technology, resource management, and commodity marketing and trade	2,000,000
Design and implementation of a marketing program for value-added fishery products and services for both local and distal markets	1,000,000
Improvement of fishery products and services through research and development, and establishment of partnerships with the private sector and government agencies	2,000,000
Enhancement of capital mobilization through credit programs and accessing of soft loans*	
Development and installation of a community-friendly market information system	1,000,000
<b>TOTAL</b>	<b>7,000,000</b>

\* - to be determined in consultation with government financing institutions (GFIs)

The total amount excludes the loan component.

**Funding Source:**

The DA–BFAR shall be the main source of funds for project activities. Additional funds may be generated by developing modularized proposals for submission to multilateral and bilateral aid agencies that provide grants and/or loans for coastal livelihood development. Moreover, access to capital and soft loans can be negotiated with and integrated with the plans and programs of GFIs.

**Risks/Assumptions:**

1. GFIs will be willing to provide the necessary loans
2. External financing may be generated from multilateral and bilateral aid agencies

**Project No. 6****Title: Infrastructure and Postharvest Facilities Development for Municipal Fisheries****Site/coverage:**

Selected areas from among former FRMP project sites and other crucial fishing areas including: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Iligan Bay; Illana Bay and Davao Gulf.

**Rationale/Background:**

Limited post-harvest facilities are one of the primary factors in post-harvest losses incurred by municipal fishers. It is estimated that these losses amount to as much as 40% of the fish catch. The lack of post-harvest and marketing facilities also explains why municipal fishers cannot bring their products to market centers in first-class municipalities and beyond. Therefore, the provision of appropriate processing facilities and technology is important. Such will not only prevent losses, but will also develop products with added value in the market. Besides technical and financial feasibility, final site selection should take into account social factors like the presence of strong fisher cooperatives.

**Goal/Objectives:**

The goal is to minimize losses and facilitate marketing of the fish products of the municipal fishers in major fishing grounds. It specifically aims to establish adequate appropriate infrastructure facilities, fish ports and fish landings, landing to market roads, harvest facilities and processing plants.

**Key Activities:**

There are four key activities. One is the selection of target sites for the development of infrastructure and post-harvest facilities. Two is the conduct of feasibility studies, to assess the technical feasibility and economic profitability. Three is the conduct of consultations with key stakeholders, including social impact assessments. Four is the actual construction of infrastructure and post-harvest facilities. This activity covers the maintenance of the facilities.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Selection of target sites																				
Conduct of feasibility studies																				
Conduct of consultations with key stakeholders																				
Construction of facilities																				

**Organization and Management:**

The DA–BFAR will be directly responsible for project implementation with concerned units and/or project management teams to be tasked with the day to day operations of the project. The PFDA will play a significant role in the establishment of the infrastructure facilities. Fisher cooperatives will be involved in the key activities of the project, from site selection up to the construction of facilities.

**Performance Tracking:**

Monitoring and evaluation shall be done through prescribed processes and procedures within BFAR in collaboration and coordination with other line agencies and government financing institutions. Performance indicators common to civil engineering works shall be used, as appropriate. Consultants and experts shall be contracted at key junctures during project implementation.

**Budget Requirement:**

Item	Amount (in PhP)
Selection of focus sites for the development of infrastructure and post-harvest facilities	1,000,000
Conduct of feasibility studies	2,000,000
Conduct of impact assessments and consultations with key stakeholders	2,000,000
Construction and maintenance of infrastructure and post-harvest facilities*	
<b>TOTAL</b>	<b>5,000,000</b>

\* - to be determined in consultation with the executive and legislative branches

Total budget excludes the construction of facilities.

**Funding Source:**

Apart from the regular budget of DA–BFAR, funds for project activities can also accessed by developing modularized proposals for submission to multilateral and bilateral aid agencies that provide grants and/or loans for infrastructure development. Build, operate

and transfer (BOT) schemes and its variants would also be employed in collaboration with the private sector.

**Risks/Assumptions:**

- 1) The NGAs and/or legislative branch may provide infrastructure funding
- 2) External financing may be generated

**Project No. 7**

**Title: Fishery Law Enforcement Enhancement**

**Site/coverage:**

Selected areas from among former FRMP project sites and other crucial fishing areas including: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Iligan Bay; Illana Bay and Davao Gulf.

**Rationale/Background:**

This project seeks to reduce the incidence of illegal and destructive fishing practices. The approach is by fostering dynamic cooperation among institutions including DA–BFAR, other line agencies, the PNP, LGUs and deputized fish wardens. Pursuit of this goal will also contribute to resolving the issue of open access. Hence, effective law enforcement shall contribute to reducing fishing effort and stress on coastal resources and ecosystems.

**Goal/Objectives:**

To integrate efforts of key stakeholders in taking action to significantly reduce illegal and destructive fishing. It specifically aims to enhance fishery law enforcement through the provision of technical and logistical support.

**Key Activities:**

There are four major activities. One is to undertake capacity building program for deputized fish wardens. Two is the establishment of coordination mechanisms among law enforcement units. This would include the representatives of Bantay Dagat, PNP and LGUs. Three is to upscaling the Bantay Dagat efforts to the fishing ground level. Such shall be undertaken in a progressive manner. Fourth is the provision of technical and logistical support to Bantay Dagat. All these activities will be done in the first four years.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Undertake capacity building program for deputized fish wardens																				
Establish coordination mechanisms among law enforcement units																				
Upscale Bantay Dagat efforts																				
Provide technical and logistical support to Bantay Dagat																				

**Organization and Management:**

The DA–BFAR will be directly responsible for project implementation with concerned units and/or project management teams to be tasked with the day to day operations of the project. Bantay Dagat groups (composed of deputized fish wardens, PNP and LGU officials) shall play a crucial role in project implementation through coordinative mechanisms with DA– BFAR.

**Performance Tracking:**

Monitoring and evaluation shall be done through prescribed processes and procedures within BFAR in collaboration and coordination with Bantay Dagat formation from the local to the national level. Appropriate performance indicators pertaining to law enforcement, such as number of arrests and types of violations committed, will be used. Consultants and experts shall be contracted at key junctures during project implementation.

**Budget Requirement:**

Item	Amount (in PhP)
Capacity building program for deputized fish wardens	2,000,000
Establishment of coordination mechanisms between Bantay Dagat, the PNP and LGUs	1,000,000
Progressive upscaling of Bantay Dagat efforts to the fishing ground level	1,000,000
Provision of technical and logistical support to Bantay Dagat (e.g. patrol boats, radios)*	
<b>TOTAL</b>	<b>5,000,000</b>

\* - to be determined in consultation with the executive and legislative branches

The total budget excludes the equipment and other paraphernalia for the Bantay Dagat.

**Funding Source:**

Apart from the regular budget of the DA–BFAR, funds for project activities can also be accessed by developing modularized proposals for submission to multilateral and bilateral aid agencies that provide grants and/or loans for environmental protection activities.

Another financing option are regular donations (in cash or kind) from corporations implementing social responsibility programs. For example, some oil companies are regularly providing fuel for seaborne patrols of the Bantay Dagat.

**Risks/Assumptions:**

- 1) Law enforcement units do not cooperate
- 2) Desired technical and logistical support to Bantay Dagat will not be provided

**Project No. 8**

**Title: Rationalization of Municipal Fishing Effort**

**Site/coverage:**

Selected areas from among former FRMP project sites and other crucial fishing areas including: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Illana Bay and Davao Gulf.

**Rationale/Background:**

Municipal or small-scale fisheries in the Philippines is underdeveloped. This is manifested by low financial support from government and formal financing institutions, prevalence of inefficient fishing gears (e.g. passive and non-motorized), inefficient fisheries information system and a poor marketing system dominated by middlemen. To bring about the benefits of the fishing industry within the reach of the greatest number of people, fish marketing has to be modernized, organized and rationalized. Only five species of small pelagics (rounscad, fimbriated sardine, Indian sardines, frigate tuna and Indian mackerel) were caught primarily by the commercial fishery sector. The rest are produced by the municipal fishery sector.

Hence, the municipal capture fisheries still play significant role in the country's food security. Unfortunately, the Philippine nearshore fisheries is largely overfished. Hence, the need to rationalize fishing effort for this sub-sector.

**Goal/Objectives:**

The goal is to promote the sustainable development of municipal fisheries. Specifically, it aims to rationalize the fishing effort that is commensurate with the productive capacity of the fishery resources.

**Key Activities:**

Eight interlinked activities shall be undertaken. One is to develop a management system to determine the sustainable catch levels. This will guide in controlling fishing effort so it does not exceed the sustainable levels. Two is to conduct an inventory of the municipal fisheries sub-sector, taking into account the fishing vessels, number of people engaged in municipal fishing, etc. Three is to develop and implement an improved system of national and local registration of municipal fishing vessels. Fourth is to monitor the catch rates and fishing effort of municipal fishing fleet in strategic fishing areas.

Fifth is to undertake the actual rationalization of fishing effort. This make take the form of more stringent requirements to secure a fishing license, banning certain types of fishing gear or introducing alternative livelihood. Sixth is the conduct research as basis for shift in using fishing gear for small pelagic fisheries. Seventh is to monitor the fishing effort in these areas. Relevant information to be generated may include the number of fishers, catch rates, etc. Eight is the conduct of participatory activities, which include IEC and capability training.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop a management system to determine sustainable catch levels																				
Conduct an inventory of municipal fisheries sub-sector																				
Develop and implement an improved system of registration of municipal fishing vessels																				
Monitor catch rates and fishing effort of municipal fishing fleets																				
Rationalize fishing effort																				
Conduct research for shift in fishing gear use																				
Monitor fishing effort																				
Undertake participatory activities																				

**Organization and Management:**

The DA–BFAR shall be directly responsible for project implementation. The FARMC Operations Center shall be assigned specific tasks and responsibilities, as may be determined. Fisher organizations shall be involved in strategic components.

**Performance Tracking:**

Monitoring and evaluation shall be done through prescribed processes and procedures within BFAR in collaboration and coordination with the FARMC System and LGUs. Relevant fishing effort indicators shall be used to monitor the rationalization of efforts. Consultants and experts shall be contracted at key junctures during project implementation.

**Budget Requirement:**

Item	Amount (in PhP)
Develop a management system to determine sustainable catch levels and control fishing so as not to exceed sustainable levels	300,000
Conduct an inventory of municipal fishing vessels, number of people engaged in municipal fishing, etc.	300,000
Develop and implement an improved system of national and local registration of municipal fishing vessels	200,000
Monitor catch rates and fishing effort of municipal fishing fleet in strategic fishing areas	500,000
Rationalizing fishing effort	200,000
Conduct research as basis for shift in fishing gear for small pelagic fisheries	500,000
Monitor number of fishers in these areas including catch rates and other relevant information	200,000
IEC / capability training / industry and community participation	800,000
<b>TOTAL</b>	<b>3,000,000</b>

**Funding Source:**

The main budget shall be sourced from the DA-BFAR. The LGUs may provide counterpart funds while fisher organizations may provide in-kind contribution. Funds for project activities can also be accessed by developing modularized proposals for submission to multilateral and bilateral aid agencies that provide grants/loans concerning rationalization of fishing effort.

**Risks/Assumptions:**

1. Fishers are not willing to rationalize/reduce their fishing effort
2. research funds will not be made available

### 4.3 Commercial Fisheries Sub-Sector

#### **Problem/issue context**

The term commercial fisheries, also called deep-sea or off-shore fisheries, refers to capture offshore fishing using vessels of more than three gross tons (GT). The sub-sector largely operates beyond the 15-km limit. It is beset by a host of intricately-related issues. The core problem in the commercial sector is the continuing depletion of the fishery resources beyond the 15-km limit. The current level of effort is already excessive, brought about by increasing number of fishers and gears. Included here is the catching of small and juvenile fishes. There is also degradation of fishery habitats brought about by, among others, the use of destructive fishing techniques, pollution and siltation. Resource use conflicts with the municipal users – as there is no clear spatial delineation of fishing boundaries – is escalating as the commercial fishers compete practically with the same fishery resources; moreover, there is also poaching of international vessels. From the institutional context, those that contribute to resource depletion include inadequate fishery policies and human resources, as well as limited scientific information. The situation is exacerbated by weak law enforcement and limited institutional partnerships.

The sectoral thrust is the rational exploitation and sustainable development of fisheries and aquatic resources in Philippine commercial waters, including the EEZ and adjacent high seas. The five priority projects described below address – singly or collectively – the above issues.

#### **Project No. 1**

**Title:** Rationalization of Fishing Effort in Overfished Commercial Fishing Areas

#### **Site/Coverage:**

This will initially cover five major commercial fishing grounds (Manila Bay, Tayabas Bay, Sibuyan Sea, Guimaras Strait, Samar Sea). Afterwards, other commercial fishing grounds will follow.

#### **Rationale/Background:**

The country's commercial marine fishery resources are biologically overfished, often severely in traditional fishing areas (Luna et al. 2004, Barut et al. 2004, Armada 2004). Based on stock assessment studies by Silvestre and Pauly (1986) and Dalzell et al. (1987), the Philippine pelagic and demersal stocks have been overfished as early as 1984. Depletion of demersal stocks was observed in almost all trawlable areas of the country, starting with the important fishing grounds like Manila Bay, Lingayen Gulf and San Miguel Bay (BINU 2005). Armada (2001) showed the overall trend of demersal stock decline in the Philippines, with the decline in stock density particularly pronounced in the 10-20m and 20-50m depth strata.

The decline in demersal stock, specifically the trawlable biomass, is supported by results of length-based assessments methods to estimate exploitation rates of common demersal species. Excessive fishing pressure has not only resulted in reduction of trawlable biomass; it has also altered the marine ecosystem such that catch composition has changed over the years (Armada 2005). Species composition changes that are reflective of growth, recruitment and ecosystem overfishing have occurred in many areas (Silvestre et al. 1986, Pauly et al. 1989, Cinco et al. 1994).

Barut et al. (2004) reiterated that an excessive fishing effort level is evident from the various countrywide and site-specific fisheries assessments conducted throughout the country. Hence, there is a need to improve fisheries management in general, and to rationalize effort reduction in particular. Hence, this project is being proposed to ensure that fishing effort is commensurate with the productive capacity of the commercial fisheries resources and their sustainable utilization.

### **Goal/Objectives:**

The project's goal is to rationalize fishing effort in the commercial fisheries. The specific objectives are:

- 1) To develop a management system of determining sustainable catch levels
- 2) To regulate fishing effort within the limits of commercial resources sustainability
- 3) To ensure the rational exploitation and sustainability of commercial fisheries resources in five priority fishing grounds

### **Key Activities:**

There are seven key activities. One is to conduct an inventory of commercial fishing vessels (CFVs), including relevant data such as number of people engaged in commercial fishing. The key output is an inventory of CFVs and relevant baseline data. Another is to monitor catch rates and fishing effort of commercial fishing fleet in project areas. This will cover EEZ and non-traditional fishing grounds. There will be a review of MSY/TAC approach to fisheries resource management and related fisheries regulations.

Another key activity is to develop a system to determine sustainable catch levels. Its key output is a management system of determining sustainable catch levels. Fishing effort will be regulated through strict requirement of a fishing license and banning of certain types of fishing gears. Capability training and IEC will be conducted throughout. Implementation of all these activities may lead to rational exploitation and sustainability of commercial fishery resources.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct an inventory of commercial fishing vessels, including relevant baseline for commercial fisheries																				
Monitor catch rates and fishing effort of commercial fishing fleet																				
Review MSY/TAC approach to fisheries resource management and related fisheries regulations																				
Develop system to determine sustainable catch levels																				
Regulate fishing effort																				
Conduct capability training and IEC																				

**Organization and Management:**

The project shall be a joint undertaking of DA-BFAR, NFRDI and BFAR Regional offices concerned. A Technical Working Group (TWG) may be organized to work out specific organization and management arrangements, identify and prioritize project sites, and draw the detailed project work plan. Project implementation shall encourage the participation of commercial fishers and fishing operators, and other concerned agencies.

**Performance Tracking:**

Project monitoring and evaluation shall be conducted on a regular basis to determine the progress of project implementation. Appropriate performance indicator shall be worked out by the TWG.

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	1,500,000
Maintenance and Other Operating Expenses	2,000,000
Capital Outlay	1,500,000
<b>TOTAL</b>	<b>5,000,000</b>

Five million pesos (are) is the estimated annual project cost. Hence, a total of twenty-five million pesos is expected over a five-year period.

**Funding Source:**

Project financing may be worked out with external funding institutions, such as Asian Development Bank (ADB) and Overseas Economic Cooperation Fund (OECE) of Japan.

The Development Bank of the Philippines (DBP) and Land Bank of the Philippines (LBP) may also be tapped. Personnel cost of the project may be borne by the proponent agencies.

**Risks/Assumptions:**

- 1) Commercial fishers may not comply with proper licensing regulations
- 2) Illegal fishing gear and methods are abated/controlled
- 3) No political intervention on the project
- 4) Fiscal and non-fiscal incentives, under which the commercial fishing industry operates, promote responsible fisheries

**Project No. 2**

**Title: Development and Implementation of a Monitoring, Control and Surveillance (MCS) System for Commercial Fisheries**

**Site/coverage:** Strategic commercial fishing areas, including the EEZ waters.

**Rationale/Background:**

The development and implementation of a monitoring, control and surveillance (MCS) system is vital for the commercial fisheries sub-sector. An MCS system may ensure that the offshore or deep-sea resources are “judiciously and wisely utilized and managed on a sustainable basis and conserved for the benefit and enjoyment exclusively of Filipino citizens.” Commercial fisheries data, particularly on offshore fishing activities (e.g., species composition, fishing effort, discards, etc.), are still very limited. Fish aggregating devices or *payaws* have proliferated and reportedly caused resource-use conflicts, particularly concerning the rational allocation and harvest of *payaw*-related resources. The protection of Philippine fisheries resources is rather lax, that poaching by international fishing vessels has become a common occurrence. Thus, there is a need for an MCS system specific to the country’s commercial fisheries.

**Goal/Objectives:**

The overall aim is to establish an MCS system specific to the commercial sub-sector. The specific aims are:

- 1) To operationalize an MCS system for commercial fisheries
- 2) To enhance the capability of implementors of MCS of maritime jurisdiction for the protection and conservation of Philippine marine resources
- 3) To minimize poaching by foreign fishing vessel
- 4) To contribute to rational exploitation and sustainability of commercial fisheries resources

**Key Activities:**

There are five key activities. One is to conduct field visits and sectoral workshops to come up with a MCS system design for commercial fisheries, including identification of MCS pilot sites. Another is the conduct of relevant training and IEC courses to develop the MCS system design. The state of commercial fishing grounds will be monitored regularly (by GIS/remote sensing). Commercial fishing areas will be patrolled. Among others, such activity will be conducted to monitor number of fishers, determine catch rates and other relevant information, check poaching of inter-national vessels, and ensure compliance with fishery regulations. Poaching will hopefully be abated. There will be establishment of effective mechanisms to monitor and control the activities of fishing vessels and fishing support vessels. The key output will be a database system for CFV licensing and monitoring.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct field visits and sectoral workshops to come up with a MCS system design																				
Conduct relevant training and IEC courses																				
Monitor state of commercial fishing grounds regularly																				
Patrol commercial fishing areas																				
Establish effective mechanisms to monitor and control the activities of fishing vessels and fishing support vessels																				

**Organization and Management:**

The project shall be led by BFAR at the national level. The BFAR regional offices shall be directly responsible for project management at the regional level. These will be supported by the private sector and other agencies concerned, particularly the Cabinet Committee on Marine and Ocean Affairs (CABCOM-MOA). This composite unit serves as the TWG for MCS as provided for in Sec. 14 of the Implementing Rules and Regulations pursuant to RA 8550.

The project shall involve other agencies concerned with maritime affairs, which include but not limited to MARINA, DND, NSC, DOF/Customs, DFA/Immigration and DOJ. The BFAR central office may organize a TWG that will identify input requirements for the development of MCS system and capability training, and draw the detailed operational plan for project implementation which shall be done by phase.

**Performance Tracking:**

Project monitoring and evaluation shall be conducted on a regular basis by project phase. Appropriate monitoring indicator shall be developed by the TWG to determine work progress.

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	2,000,000
Maintenance and Other Operating Expenses	5,000,000
Capital Outlay	3,000,000
<b>TOTAL</b>	<b>10,000,000</b>

Ten million pesos is expected for annual running cost. Hence, the total for five years is 50 million pesos.

**Funding Source:**

Project financing may be sourced out from funding institutions. These would include but not limited to: ADB, OECF, DBP and LBP. Personnel cost may be borne by the participating agencies.

**Risks/Assumptions:**

- 1) No political intervention on the project
- 2) Fiscal and non-fiscal incentives, under which the commercial fishing industry operates, promote responsible fisheries

**Project No. 3**

**Title: Development, Adaptation and Promotion of Selective, Environmentally-Friendly and Cost-Effective Fishing Gear and Practices**

**Site/coverage:**

Strategic commercial fishing areas where selectivity experiments shall be conducted

**Rationale/Background:**

Great quantities of unwanted by-catch species are being discarded at sea, which has a direct negative impact on the resources, the environment, and on the availability of fish for consumption (FAO 1998). By-catch of non-target species that were simply killed and discarded has contributed immensely to biodiversity loss and possibly to ecosystem changes (Ingles 2004b). These include endangered species (*e.g.*, sea turtles in shrimp trawl catches), marine mammals such as the Irrawaddy dolphins in gillnet catches in

Malampaya Sound (BINU 2005), finfish catches in shrimp trawls, and under-utilized species such as jellyfish).

The volume of discards would be greatly reduced though the use of selective gear and fishing practices. These fishing gears/methods would capture only those sizes and species targeted, ideally releasing all non-targeted species unharmed. In some parts of the world, efficient selective fishing gear and harvesting practices have been introduced successfully (FAO 1998). Locally, selective, environmentally-friendly and cost-effective fishing gear and practices could also be developed, adapted and promoted, and later on adopted by commercial fishers. These may lessen the direct negative impact on commercial fisheries resources and minimize biodiversity loss.

### Goal/Objectives:

The project's broad aim is to promote environment-friendly fishing practices for the commercial sector. The objectives are:

- 1) To develop selective, environmentally-friendly and cost-effective fishing gear and practices
- 2) To enhance adoption of selective fishing gear and practices by commercial fishers
- 3) To contribute to protection of commercial fishing grounds and associated biodiversity

### Key Activities:

There are three major inter-linked activities. First is to conduct research technology verification and adaptation on fishing techniques that have been proven effective in other countries. Such techniques include gear and equipment modifications and practices that would reduce the incidental catch of endangered species. Examples are turtle excluder devices. Second is to develop selective and environmentally-friendly and cost-effective commercial fishing gear and practices that would efficiently size-select organisms and reduce the catch of juvenile fish and non-target species. The first two activities would result in new selective gear/techniques. The third task is the conduct of capability training and IEC. These may take the form of training courses and extension services.

### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct research technology verification and adaptation on fishing techniques																				
Develop selective and environmentally-friendly and cost-effective commercial fishing gear and practices																				
Conduct capability training and IEC																				

**Organization and Management:**

The project shall be a joint undertaking of the government and the commercial fishing industry. On the government side, an academic or research institution shall take the lead. A TWG may be convened to work out specific organization and management arrangements, identify and prioritize project sites and coverage, and draw the detailed project work plan. Selectivity research can be conducted cost effectively aboard commercial fishing vessels, under commercial operating conditions. Arrangements with commercial fishing operators – who shall become project collaborators – may be made to facilitate project implementation.

**Performance Tracking:**

On a regular basis, performance tracking shall be undertaken to determine work progress. Appropriate research monitoring indicator shall be established.

All aspects of selectivity work must be quantified through systematic and rigorous data collection. Once the technologies are developed these shall be disseminated to the industry.

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	800,000
Maintenance and Other Operating Expenses	1,700,000
Capital Outlay	1,500,000
<b>TOTAL</b>	<b>4,000,000</b>

Given the annual cost of four million pesos, the estimated cost for the five-year period is 20 million pesos.

**Funding Source:**

Project financing may be worked out with local funding institutions. Research grants from international sources shall be tapped. Personnel cost may be borne by the participating government agencies. The commercial fishing operators are anticipated to provide in-kind and cash contributions.

**Risks/Assumptions:**

- 1) Lack of available funds from government to support the project
- 2) Commercial fishers may not accept the introduction of new fishing techniques and practices proven effective in other countries, including the adaptation of locally developed selective fishing gear
- 3) The commercial fishing industry is willing to be a project partner

**Project No. 4****Title: Exploratory Fishing in the EEZ and Beyond, and in Under-Exploited Commercial Fishing Grounds****Site/coverage:** EEZ waters and beyond, including non-traditional fishing grounds**Rationale/Background:**

While overfishing in the commercial fisheries sector has been documented in many publications, under-exploitation of Philippine fisheries resources has also been reported in particular areas in the EEZ waters and beyond. In many cases, foreign nationals, instead of Filipinos, are the ones exploiting the country's offshore fishery resources. Up until now, the country has not yet fully determined the existing or possible commercially-valuable fishery resources in these areas.

Bernacsek (1996) opined that some opportunities exist for increased harvesting of offshore fisheries resources beyond the continental shelf in the EEZ. These resources include tuna, other large pelagic and deep-water continental slope species. He estimated a potential yield of 200,000-300,000 mt from the EEZ. Exploitation of underutilized fishery resources would thus contribute to the fishery sector's goal of food security, among others.

**Goal/Objectives:**

The overall aim is to assess the full economic potential of the EEZ water and beyond. The specific aims are:

- 1) To determine the full biological and economic potential of existing fisheries resources in the EEZ and non-traditional commercial fishing grounds
- 2) To develop a scheme for underutilized fishery resources in commercial fishing grounds

**Key Activities:**

There are four major activities. One is to conduct exploratory fishing in EEZ waters and strategic non-traditional fishing grounds. This shall determine the economic viability of existing commercial fishery thereat. Another is to monitor the fishing activities in EEZ and underexploited fishing grounds. Such activity shall provide baseline data. Still another is to determine the species of fish and other aquatic resources existing in the EEZ waters and beyond. Its key output is the species composition of offshore resources. Fishing in EEZ waters and beyond shall be encouraged, if fishing would be financially viable.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct exploratory fishing in EEZ waters and strategic non-traditional fishing grounds																				
Monitor fishing activities in EEZ and underexploited fishing grounds																				
Determine the species of fish and other aquatic resources above areas																				
Encourage fishing in EEZ waters and beyond																				

**Organization and Management:**

The project shall be jointly implemented by the BFAR Central Office, NFRDI, and BFAR Regional Offices. A TWG may be organized and convened to work out specific organization and management arrangements, identify priority project sites, and draw the detailed project work plan. Deep-sea fishing would require large-scale commercial fishing vessels and, therefore, huge investments. Therefore, appropriate arrangements with the private sector shall be made. Arrangements for joint fishing ventures with both Filipino and foreign nationals shall be explored.

**Performance Tracking:**

Project monitoring and evaluation shall be conducted on a regular basis to determine work progress. Appropriate monitoring indicators shall be developed by the TWG.

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	2,000,000
Maintenance and Other Operating Expenses	5,500,000
Capital Outlay	9,500,000
TOTAL	17,000,000

Eighty five million pesos is the estimated project cost over a five-year period.

**Funding Source:**

Project financing may be worked out with either external funding institutions, (ADB, OECF and WB) or local banks (DBP and LBP). Personnel cost may be borne by the proponent agencies. The private sector may provide in-kind contributions.

**Risks/Assumptions:**

- 1) Continuing rise in fuel may make fishing in deeper and more distant fishing grounds unprofitable for commercial fishers/operators
- 2) Funds are available, and national policies are favorable to public-private partnership, including joint ventures
- 3) Fiscal and non-fiscal incentives, under which the commercial fishing industry operates, promote responsible fisheries

**Project No. 5****Title: Biology and Culture of the Pacific Bluefin Tuna (*Thunnus orientalis*)****Site/coverage:**

Northern and eastern Luzon waters (Cagayan, Isabela and Aurora Provinces), Davao and Palawan

**Rationale/Background:**

A recent survey conducted in northeast Luzon (Lewis 2005) showed circumstantial evidence of the presence of juvenile Pacific bluefin tuna (1-6 kg in size) in the waters of Cagayan Province. The same species is also regularly captured by handline vessels being unloaded in Dingalan (Aurora Province). Lewis (2005), in his brief report on Pacific bluefin survey of northern Philippines noted that: "There is a reasonable expectation, based on anecdotal reports of landings of juvenile Pacific bluefin tuna (*Thunnus orientalis*) in northern and eastern Luzon (Ganaden *et al.*, pers. com.), the proximity of this area to seasonal captures of spawning adult bluefin by Taiwanese longliners and the occurrence of larval bluefin tuna in adjacent waters, that quantities of juvenile Pacific bluefin tuna may regularly occur within northern Philippine waters." The spawning of Pacific bluefin occurs between Japan and the Philippines in April, May and June, off southern Honshu in July, and in the Sea of Japan in August. The larvae, postlarvae and juveniles produced near the Philippines and south of Japan are usually transported northward by the Kuroshio Current toward Japan. Given variations in the prevailing currents, such may also be transported to Philippine waters. Fish of age 0, about 15 to 60 cm in length, are caught in the vicinity of Japan during the summer, fall and winter of their first year of life. Moreover, they appear also to occur to an unknown extent in northern Luzon. Such occurrences, if available in commercial quantity, could potentially support commercial cage culture of the species. This cage culture system has been successfully developed for the same or related bluefin species in committees like Australia, Mexico, Croatia, Spain and Morocco.

**Goal/Objectives:**

The project's broad aim is to find other offshore species that could be utilized to contribute to the sustainability of the commercial fisheries sub-sector. The specific objectives are:

- 1) To establish additional knowledge on the biology and age culture of the Pacific bluefin tuna
- 2) To pilot test the cage production of bluefin tuna for the domestic market and possibly for export

**Key Activities:**

There are four key activities. One is to conduct land-based and seagoing surveys to determine bluefin tuna occurrences in the target areas. This may include identifying possible location of grow-out cages. Another is the actual conduct of biological studies to determine more detailed information on bluefin tuna. Key parameters would include identification criteria, size composition (by gear), spawning, seasonality and association with other tuna species.

The third activity is to prepare the grow-out cages in strategic culture sites, based on the results of the first two activities. The juvenile bluefin tuna will be eventually reared in the stock cages. Monitoring of culture and management activities will follow.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct land-based and seagoing surveys to determine bluefin tuna occurrences																				
Conduct biological studies to determine more detailed information on bluefin tuna																				
Prepare grow-out cages in strategic culture sites																				
Monitor culture and management activities																				

**Organization and Management:**

The project shall be implemented by BFAR Regional Office in northern and eastern Luzon, Palawan and Davao in cooperation with the BFAR Central Office and NFRDI. Research institution, such as UPV or SUCs based in these regions may be tapped. A TWG may be convened to work out specific organization and management arrangements, identify and prioritize project sites, and draw the detailed project work plan.

**Performance Tracking:**

Project monitoring and evaluation shall be conducted on a regular basis to determine the progress of implementation based on agreed work plan. Appropriate monitoring indicator strategies shall be developed by the TWG.

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	500,000
Maintenance and Other Operating Expenses	1,500,000
Capital Outlay	2,000,000
<b>TOTAL</b>	<b>4,000,000</b>

With an estimated annual project cost of four million pesos, a total of twenty million pesos is expected over the five-year period.

**Funding Source:**

Project financing may be sourced out from BFAR and congressional funds. Funds from funding institutions (ADB, OECF, DBP and LBP) may be also tapped. Research grants may come from fisheries agencies like FAO and SEAFDEC. Personnel cost may be borne by the proponent agency, with support funding from financing institution for honoraria and/or research incentives of in-house project implementers.

**Risks/Assumptions:**

- 1) Grow-out cages set up beyond municipal waters may be capital-intensive and unprofitable to small-scale/medium commercial fishers/operators
- 2) Market price of bluefin tuna is encouraging to attract commercial fishers/operators to invest on the culture of the species
- 3) Prevailing water temperatures are higher than the apparent preferred water temperature of larger bluefin tuna

## 4.4 Aquaculture sub-sector Projects

### Problem/issue context

The aquaculture industry is confronted with several problems including (1) poorly developed supply chain of low-cost food fish for domestic consumption; (2) limited and erratic volume of export products; (3) inadequate RD & E and lack of commercial impact; (4) limited use of genetically superior strains in aquaculture; and (5) limited variety and/or availability of seeds, especially for mariculture. The poorly developed supply of low cost food fish is caused by the erratic price due to seasonality of non-farmed fishery products, relatively high price of aquaculture products, erratic production of some farming centers (*i.e.* Laguna Lake), undeveloped frozen and processed products, high transport cost, and lack of institutional promotion and marketing. The limited and erratic volume of export products is caused by the lack of capital, poor production efficiency of existing farmers, diseases in the grow-out, lack of disease free broodstock, and lack of seedstock supply for high-value fishes.

R&D has focused on basic research while many of the researches and extension workers are not attuned to commercial realities. There is also limited financial support from government and private sector. There are very limited ventures on domestication of genetically superior strains in aquaculture due to high cost, long-term return on investment, and lack of technical expertise. In addition, the existing legislations are obstructive to the use of genetically superior strains from other countries. The lack of broodstock and few operational hatcheries in the Philippines has resulted in limited variety and/or availability of seeds, especially for mariculture.

### Project No. 1

**Project Title: Advocate Develop a focused, united and strategic vision and road map for the industry**

**Site/Coverage:** National

### **Rationale/Background:**

The Philippine aquaculture industry is yet to realize its full potential. Over reliance on government to guide and promote aquaculture development and markets has led to ineffective industry programs, policies, and regulations. Moreover, the situation is exacerbated by the lack of understanding of the dynamics of the aquaculture sector, the failure to be on top of industry developments and trends, and the lack of continuity of programs due varying agendas of different administrations

**Goals/Objectives:**

- a. Strengthen industry support organizations towards the realization of focused and strategic programs with government
- b. Adopt a common national agenda and rationalize government policy support
- c. Promote industry development through private sector initiatives, with strong government support

**Key Activities:**

- 1) Undertake capacity building programs that will provide industry support organizations with the proper tools in assessing industry needs and market realities
- 2) Support the establishment of “umbrella” organizations to represent the interest of industry and provide appropriate government recognition and support
- 3) Solicit support to existing road maps from all government agencies 4) Jointly review with BFAR existing programs, policies, and regulations by government and work out necessary amendments

**Schedule of Activities**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Undertake capacity building programs																				
Establishment of “umbrella” organizations																				
Preparation of road maps/Implementation																				
Review existing programs, policies, and regulations																				

**Organization and Management:**

The Development Academy of the Philippines (DAP) and UP Aquaculture Society, Inc. (UP AQUASOC will identify key industry support organizations based on its projects while DAP will provide the necessary capacity building programs; AQUASOC will assist DAP in the customization and implementation of the training module).

DA-BFAR, DTI, DOST, SEAFDEC, DENR (consistent to their mandates, DA-BFAR shall engage with industry on extension support, DTI on marketing, DOST and SEAFDEC on technology, and DENR and sustainability issues.

Solicit support to existing road maps from all government agencies (DA-BFAR, DTI, DOST, SEAFDEC, DENR).

Proposed aquaculture federation (proposed federation shall work with *ad hoc* committees from DA-BFAR, DTI, DOST, SEAFDEC, and DENR to come up with the specific recommendations and actions over a 6-month time frame).

### Performance tracking:

Monitoring and evaluation processes will include the following:

1. Monitor for gaps and make adjustments
2. Assess strength and effectiveness of networks and partnerships
3. Continue to upgrade established capabilities
4. Regularly conduct visioning/scoping exercises with stakeholders
5. Realign directions and priorities/improve road maps established (if needed)
6. Monitor how well the federation gets represented in various sectoral meetings
7. Monitor acceptability of such federation
8. Regularly review its composition (make adjustments when needed)
9. Monitor how well the federation gets represented in various sectoral meetings
10. Monitor acceptability of such federation
11. Regularly review its composition (make adjustments when needed)
12. Monitor acceptability and level of support provided
13. Continuous monitoring and periodic evaluation of established plans, policies and regulations as to how effectively they address industry needs and vision (conduct surveys/workshops and other feed back mechanisms)

### Budget Requirement:

Item	Amount (in PhP)
Training (Luzon, Visayas, and Mindanao) inclusive of cover transport, accommodation, training materials, and organizational and professional fees @ 6M/training program	6,000,000
Workshops and organizational expenses (drafting of the federation's constitution and short-term programs @ 1M/organization x 6 organizations x 5 years	30,000,000
Travel and accommodation expenses	2,500,000
Publication and information dissemination expenses	1,000,000
Meeting expenses and dissemination of output	3,000,000
<b>TOTAL</b>	<b>42,500,000</b>

### Funding Source:

Capacity building project activities will be funded by the BFAR, DTI and DOST, Planning activities, including preparation of commodity road maps will Initially be funded by the national government while sustaining funds will be raised from private sector.

**Risks/Assumptions:**

- 1) Support organization not truly representative of their stakeholders, or weak leadership of support organization
  - 2) Weak leadership of the federation
  - Enhanced efforts not supported by government
- 3) Dominance of certain sub-sectors in the federation; lack of support and commitment from government; lack of funds
- 4) Government not receptive to set programs
- 5) Lack of commitment/political will from concerned government agencies; lack of follow through from federation where act of congress is required

**Project No. 2**

**Project Title:** Enhance RD & E programs and prioritize according to immediate needs of industry

**Site/Coverage:** National

**Rationale/Background:**

Over the decades, the Philippines has developed a critical mass in fisheries Research, Development & Extension (RD & E). To date, however, there still exist gaps in relating scientific value and commercial value of some research findings. Most of those with objectives of developing technologies were directed towards food production, generation of employment, provision of social services and earning foreign exchange. On the whole, the direction and development of RD & E are dependent on the following conditions:

- Competence
- RD & E needs (including industry needs)
- Scientific value of research
- Commercial value of research findings leading to generation of technologies
- Fund availability (local, regional or donor-funded)
- Research orientation
- Mandate of institutions conducting RD & E
- Purpose of grants providing for R & D
- Availability of facilities/tools to carry out RD & E
- Coordination with other institutions/bodies conducting similar activities
- Technical assistance provided by specialists from other institutions of excellence (local/foreign)
- Strength of networks developed with stakeholders or beneficiaries of RD & E
- Efficiency of Information/Data Systems (generation and retrieval)
- Constraints

The *Medium-Term Philippine Development Plan 2004-2010* clearly states that systemic failures arise from lack of coherence among the networks of institutions, resources, interactions and relationships, political mechanisms and instruments, and scientific and technological activities that define, promote, articulate and encourage technological

innovation and diffusion (which involves generation, importation, adaptation and dissemination of technologies) process.

Through the years, the government's strength and weaknesses in all these critical areas have been repeatedly addressed in strategic planning and policy meetings.

Research orientation in some cases has been such that institutions have become isolated centers of excellence, basically focusing its major undertakings only to research (and perhaps up to generation technologies). In some cases, RD & E has failed to address some issues related to technology generation. Lack of funding and appreciation of its full potential (commercial, to benefit industry stakeholders) may have contributed to this state.

Certainly, RD & E in aquaculture are essential in coping up with increasing challenges in farming. Investing on RD & E therefore is not a matter of choice but is a necessity for the industry in achieving competitiveness. There is the need for private sector to beef up its RD & E capabilities and reduce reliance on government. In Thailand, the sheer size of Charoen Pokphand's business operations has made it the industry's de facto private-sector leader in the provider of RD & E. With no such equivalent entity in the Philippines, it is recommended that industry form a research consortium supported by government, that would: (a) coordinate private-sector efforts on research and development; (b) collaborate with national and international research institutions on the conduct of priority R&D needs; (c) assist government research institutions in rationalizing its RD & E activities for the industry; (d) be the industry's lead entity in the formulation of Best Aquaculture Practices; and (e) raise funds from private sector, international community, and national government to support the research needs of the industry as a whole (Fisheries and Aquaculture Board, 2005).

There is a need to encourage private sector and other stakeholders to fund some research areas related and essential to farming (genetics, broodstock development, biotechnology, etc.). Of significance would be investments in aquaculture biotechnology and development of feeds of cheaper (indigenous) raw materials. Non-traditional sources of funds (such as public investment) in biotechnology research should be tapped for the sub-sector.

Given the reality of diminishing catch from the seas, research has focused on developing technologies that will increase farm production and on identifying cultivable and high-yield species. Species with high-value export potential, like shrimp, command the most attention in research and extension efforts.

Agbayani *et al.* have indicated that environmental degradation and changing social values with regard to the empowerment of people, the role of women and children, and equitable distribution of benefits from, and access to, natural resources have caused the refocusing of research to include, even prioritize, assessing impacts of aquaculture development projects on the quality of life of targeted communities.

Government and other institutions working towards development of aquaculture should put forward long-term R&D thrusts and directions to ensure the continuity of research initiatives and undertakings. R&D funds should be made available for breeding programs as well.

**Goals/Objectives:**

- a. Focus government RD & E programs on improving productivity and competitiveness
- b. Promote investment on research from the private sector

**Key Activities**

- a. Establish a private-sector and government research consortium that will attend to priority R&D needs of aquaculture sector
- b. Provide appropriate government funding support to the research consortium
- c. Provide fiscal incentives for private-sector investments on R&D
- d. Establish an incentive system for government scientists based on successful commercialization of research output

**Schedule of Activities**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Establish a private-sector and government research consortium	■																			
Provide appropriate government funding support to the research consortium					■															
Provide fiscal incentives for private-sector investments on R&D	■																			
Establish an incentive system for government scientists	■																			

**Organization and Management:**

SEAFDEC, BFAR, DOST, UPV-COS, UP-MSI, CLSU, BAR (SEAFDEC shall host the 2-day workshop which will be participated by key government research institutions and industry support groups).

DOST-PCAMRD/PCIERD\DOST shall take the lead role in organizing the aquaculture research consortium, and shall present potential strategies based on government S&T programs with private sector in other countries)

DA-BFAR, BOI and DTI will work towards provision of fiscal incentives for private-sector investments on R & D.

DA-BFAR; SEAFDEC AQD/PCAMRD will help establish an incentive system for government scientists

**Performance tracking:**

- 1) Validate effectiveness of focused programs in relation to industry needs (measure improvements; make adjustments if needed)
- 2) Assess impacts and extent of appreciation of new technologies for application as basis for adjusting/improving incentive schemes established
- 3) Monitor if schemes have resulted to increase in the number of technologies packaged (commercialization)
- 4) Validate such technologies by conducting trials with farmers
- 5) Validate effectiveness of participatory research
- 6) Continue to identify gaps and flaws (if any)
- 7) Regularly review budgets if sufficient (solicit additional funds if needed)
- 8) Monitor/assess investment climate if improved (tap non-traditional sources of funds if existing investments not sufficient)
- 9) Evaluate extent of support provided to R & D
- 10) Evaluate level of technology and impact to industry

**Budget Requirement:**

Item	Amount (in PhP)
Consultancy fees (Establishment of consortium)	2,000,000
Support to Consortium @ 50 million/yr x 5 years)	250,000,000
Consultancy fees (preparation of fiscal incentives)	1,000,000
Consultancy fees (Establish an incentive system for government scientists)	1,000,000
<b>TOTAL</b>	<b>254,000,000</b>

**Funding Source:**

BAR will support establishment of the consortium while DOST-PCAMRD DOST-TAPI will provide operational funds for the consortium

**Risks/ Assumptions:**

- 1) Limited availability of funds for R&D work from government
- 2) Fund commitments from private sector and government not adequate to support R&D needs of industry
- 3) Inadequate incentives; lack of appreciation by private sector

**Project No. 3****Project Title:** Strengthen the local hatchery industry**Site/Coverage:** National**Rationale/Background:**

Seed production is one of the most viable farming technologies for major and promising cultivable species, considering that to date stocking requirements of brackishwater ponds, fishpens and seacages can not be met due to insufficient fry supply both from the wild and existing hatcheries for shrimp, crustaceans and mollusks.

The country's milkfish industry alone has been saddled over the years by an acute fry shortage problem. Earlier records of 1.2 billion fry annually collected from the wild has dropped to a low of 600 million. In 1994, about 20 million fry were reportedly imported from Taiwan. Presently, an estimated 360 million fry are being imported during peak seasons.

In addition to milkfish, there is an equal need to pursue intensive production of hatchery bred major cultivable species for the country to attain self sufficiency in seed stock supply, minimize (if not totally stop) importation. Efforts should also be geared towards volume production of quality fry in strategic areas in the country.

Strengthening of the local hatchery industry can backstop seasonality and inconsistency of seed supply. Captive broodstock materials will have to be established as well.

In anticipation of the availability of low-cost high quality and consistent supply of seed produced from captive broodstock, social implications on the wild seed industry need to be considered. Marginal fishers who depend on collection of wild seeds as livelihood will be most affected. Alternative livelihood opportunities needed to be instituted

Standardized and reliable techniques still have to be developed to achieve a year-round seed supply.

To increase the supply of good quality seeds, R & D on captive broodstock of economically important cultivable species should be intensified. Species of high potential should be identified and be given funds for conduct of further research and refinement of culture technologies.

Government should develop policy and regulatory frameworks that recognize basic differences in reproductive protocol for producing seed for aquaculture and seed for stock enhancement. These frameworks should also provide for measures to mitigate loss of economic opportunity to marginal fishers who derive income from collection of wild seeds.

**Goals/Objectives:**

- a. To achieve reliable supply and sources of seed stocks by encouraging/promoting more investments in hatchery ventures



**Organization and Management:**

SEAFDEC will undertake refinement of hatchery and grow out techniques and will work on new potential species.

SEAFDEC and BFAR will identify viable investors, suitable sites, and competent cooperators for the establishment of the broodstock facilities and natural food centers; Land Bank will provide the necessary financing through a soft-loan

BFAR shall review existing policies and regulations on the introduction of exotics

FAB and the newly formed aquaculture federation shall provide the view from private sector on commercial implications.

SEAFDEC shall provide the necessary technical arguments. The output of the activity shall be a concrete strategy for an improved government policy support on industry

DTI-BOI shall prepare the appropriate fiscal incentives for the pioneering venture.

Land Bank shall explore possible financing channels with attractive loan packages.

SEAFDEC and BFAR shall provide the technical arguments.

SEAFDEC and BFAR will identify NGOs, LGUs, and SUCs as broodstock centers and natural food centers to support the development of small-scale hatcheries

**Performance tracking:**

- 1) Monitor efficiency of prevailing loan packages; Establish feedback systems (surveys/interviews)
- 2) Evaluate strength of collaborative linkages to guarantee support needed by hatchery operators (make improvements when needed)
- 3) Assess capabilities regularly; upgrade through conduct of trainings/seminars
- 4) Check practices and maintenance of facilities
- 5) Continued assessment of importation and introduction regulations if supportive to industry growth (or “prohibitive” in nature)
- 6) Review and adopt changes without compromising state of local stocks (established risks and inherent problems of certain exotic stocks/strains)
- 7) Continuous assessment of level of contribution/ \benefits to industry over periods of time
- 8) Target or set timelines to achieve expected results (successes) so as to propel industry faster
- 9) Evaluate strength of collaborating bodies to ensure provision of support needed

**Budget Requirement:**

Item	Amount (in PhP)
Consultancy fees (SEAFDEC:hatchery/growout)	1,000,000
Loanable Funds	100,000,000
Consultancy fees and meeting expenses (Flounder Stocks)	1,000,000
Consultancy fees (investment packaging)	4,000,000
Funds for study tours, conduct of investors forum, etc.	
Start/-up/subsidize project during first 3 years	20,000,000
<b>TOTAL</b>	<b>126,000,000</b>

**Funding source:**

Land Bank will provide investment incentives and loan packages.

BFAR will make available funds for legislation on importation of founder stocks

DTI will fund promotion of investment of foreign genetic companies in partnership with local companies

BFAR, SEAFDEC, and PCAMRD will help provide funds for the development of small hatcheries

**Risks/assumptions:**

- 1) Due to the lack of economies of scale and limited marketing capability, small-scale hatcheries will likely need to focus their operations on high-value niche species
- 2) Lack of appreciation by BFAR
- 3) Absence of takers due to poor investment climate
- 4) Funding sources to put up necessary facilities and support for management and technical staff

**Project No. 4**

**Project Title:** Develop Domestic Supply Chain And Expand Export Markets

**Site/Coverage:** National

**Rationale/Background:**

A major obstacle to the growth of Philippine aquaculture in recent years is the erratic and occasionally very low prices in the local market. Such market condition is mainly attributed to the: (a) seasonal oversupply of fish due to seasonal harvest from wild fisheries, (b) poorly developed domestic supply chain, and (c) undeveloped export market. As a consequence, there have been fewer investments in aquaculture and many farmers have cut down on their inputs to reduce production cost at the expense of yield.

Additionally, there has been the biased development of aquaculture towards large integrated ventures, effectively discouraging the participation of small players. To sustain the growth of aquaculture as a business and as a livelihood, there is the need to expand both the domestic and export markets, through the development of better quality products, and a more efficient supply chain.

Recently, consumers of traded aquaculture products have influenced choices and preferences, urging major importing countries to impose standards and regulations to ensure food quality and safety. Some of these regulations have also paved the way for farmers to indirectly reduce environmental impacts of production activities. With standards pertinent to aquaculture (labeling, traceability, antibiotic residues) now in place, various market strategies continue to develop for adoption. These include: (1) product certification; (2) eco-labelling; (3) ethical or “fair trade”; and (4) organic produce, all aimed at improving public image of producers and gaining consumer confidence.

The Philippines should take up the challenge and support implementation of good practices and compliance to quality standards. Facts and figures will have to be gathered and consolidated to serve as guideposts to status and level of compliance of existing farming and ancillary industry activities. Protocols will have to be established (or designed) based on prevailing international codes of conduct/practice. Concerted efforts of regulators (government), industry, the academe and scientific communities and NGOs will have to be effected from initial planning stages down to implementation

**Goals/Objectives:**

- a. Improve on the quality of aquaculture products
- b. Improve on the distribution and marketing efficiency of the domestic supply chain
- c. Expand the domestic supply chain through the marketing of processed and niche products
- d. Develop and expand the export market with emphasis on quality, food safety, and traceability

**Key Activities:**

- 1) Identify appropriate Match production and market centers for specific products and improve marketing channels and cost-efficiency in transport
- 2) Promote investments in cold storage and processing facilities in strategic locations
- 3) Undertake marketing campaign to develop domestic market for frozen and processed products to allow storage during peak production months
- 4) Undertake marketing campaign to develop the export market for frozen and processed products
- 5) Promote the farming of export-oriented species/products where the country can develop marketing advantage

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Identify appropriate market centers for specific Match products ion and market centers and improve marketing channels and cost-efficiency in transport																				
Promote investments in cold storage and processing facilities in strategic locations																				
Undertake marketing campaign to develop domestic market for frozen and processed products																				
Undertake marketing campaign to develop the export market for frozen and processed products																				
Promote the farming of export-oriented species/products																				

**Organization and Management:**

- 1) UP AQUASOC will undertake the study over a period of 6 month; the organization, which has long working relationship with private sector, will be able to directly access the necessary data and information
- 2) DTI will be the lead agency in this project, which will involve key private-sector support organizations and concerned government agencies
- 3) The newly formed Seafood Council in collaboration with DTI, will undertake a 2-year market development program to develop new markets
- 4) SEAFDEC will be the lead agency in this project, which will involve key private-sector support organizations and concerned government agencies

**Performance tracking:**

- 1) Monitor improvement in production volumes of identified species (satisfying market demands)
- 2) Monitor acceptability of developed products
- 3) Monitor/assess investment climate if improved (tap non-traditional source of funds)
- 4) Evaluate extent of implementation made on recommendations put forward ( re prioritize when necessary)
- 5) Identify arising problems and constraints in implementation of such recommendations (action plan)
- 6) Assess effectiveness of campaigns/promotions
- 7) Assess coverage achieved (make adjustments to improve); consider other tools/means

**Budget Requirement:**

Item	Amount (in PhP)
Consultancy fees (market matching)	2,000,000
Consultancy fees and conduct of investors forum (investment promotion)	3,000,000
Marketing campaign (domestic) @P3,000,000/yr x 4 years	12,000,000
Marketing campaign (export) P5,000,000/yr x 4 years	20,000,000
Promotion farming of export-oriented products @ P1,000,000/yr x 3 years	3,000,000
<b>TOTAL</b>	<b>40,000,000</b>

**Funding Source:**

Private Sector (thru FAB), DTI, and DOST-PCAMRD for market matching

DTI for promotion of investment and market campaigns (domestic and export)

DTI and Private Sector (thru Seafood Council) for export market and farming campaign programs

**Risks/Uncertainties/Assumptions:**

- 1) Crop/product fails to take off due to changes in market/consumer preferences
- 2) Displacement of jobs and livelihood and traditional distribution and marketing systems
- 3) Entry of lower cost imported frozen products

**Project No. 5**

**Project Title:** Institutionalize Best Aquaculture Practices (BAP)

**Site/Coverage:** National

**Rationale/Background:**

The rapid growth of aquaculture over the past two decades was achieved through (a) expansion in area; and (b) intensification of aquaculture systems (de Jesus, 2002). Expansion of aquaculture areas included conversion of large tracts of mangrove forests and swamps, and even coconut plantations, into fish and/or shrimp farms. The total mangrove area in the Philippines decreased from 450,000 hectares in 1920 to only about 141,700 hectares in 1988 (Aypa & Bacongis, 2000). The resultant impacts are social and ecological. Loss of forestry and fish and fishery products, including wild seed have implications on income of coastal dwellers derived from these resources. Ecological impacts include alterations to patterns of silt retention, land formation, erosion and loss of

protection from storm surges. After damages have been done, it is now generally agreed that mangrove areas are poor sites for aquaculture because of acid sulfate soil problems.

Intensification involves high stocking of the cultured species per unit of production area. This requires feed inputs since the natural food organisms within the culture system cannot support the food requirements of the cultured fish. Feeding increases nutrient loads from fecal and non-fecal excretion and unconsumed feeds. Chemicals such as therapeutants, pesticides, herbicides, and inorganic nutrients are also commonly used to enhance productivity. When released directly into natural bodies of water these wastes and chemicals have polluting effects when the volumes exceed the carrying capacity of these waters.

It has also been a common practice for aquaculture farms to develop in clusters concentrated within a small geographic area like enclosed coastal waters with poor water exchange. This often leads to self-pollution where one farm's effluent becomes another farm's or even the same farm's intake. These problems may be attributed to lack of properly planned and regulated aquaculture development that should have a balance between economic development and environmental considerations.

Since aquaculture development makes use of many resources like mangroves, water or sea areas that are common property, mechanisms should be in place to ensure that aquaculture development is planned in close consultation with other resource users. Approaches can include integrated coastal zone management with specific conditions on location and intensity of aquaculture, establishment of buffer zones and other considerations.

There are now available technologies and practices that would make aquaculture operations environment-friendly. The most effective approach is to prevent or reduce the discharge of pollutants. These technologies include integrated recirculating systems and treatment of wastes before discharge. Development of environment-friendly feeds with optimum nutritional characteristics and improvements in feed management can also minimize environmental impacts. The best approach to a successful aquaculture venture is to culture at the highest stocking density possible without degrading the environment.

RA 8550, the Philippine Fisheries Code of 1998 and the Agriculture and Fisheries Modernization Act (AFMA) have various provisions for aquaculture that pertain to environmental sustainability. The trend toward environment-friendly aquaculture is also evident in the activities of the various aquaculture agencies and institutions in recent years.

Even with the many activities that are now being pursued, these apparently still have no impact as serious environmental problems in the sector still remain. Limited budgets and the overriding desire to produce more impede the development of a totally environmentally responsible aquaculture sector. The profit motive orientation, voluntary nature of the code of practice for aquaculture, and weak monitoring and enforcement capabilities of both the national and local governments constrain the adoption of environment-friendly practices. Another is the people's attitude of careless disregard toward the environment and the ineffective enforcement of regulations to penalize the violators. In addition, some people, who are prepared to adopt environment-friendly practices, could not do so because of lack of financing in the re-construction of their farms to suit the innovations.

Research on environment-friendly technologies should be intensified, to include formulation of superior diets and innovations in culture practices that minimize polluted effluents. These innovations should be promoted among the private sector through effective training, extension and demonstration. The adoption by the private sector of the codes of conduct for fisheries and aquaculture should be hastened by developing economic incentives. The system for penalizing environmental offenders in aquaculture should be reviewed and make it an effective deterrent for potential offenders as well as punishment for actual ones.

Importantly, there should be a national zoning and resource-use plan based on environmental carrying capacities of zones. The government should also provide incentives to encourage farmers to locate their farms within designated zones through the provision of infrastructure, training on best management practices, access to credit and marketing support and other related assistance.

#### **Goals/Objectives:**

- a. Develop an industry-led commodity-oriented guidelines for BAP and a certification system for compliance based on existing programs from other countries
- b. To train certifiers within the Bureau and its affiliate bodies
- c. To routinely conduct certification inspections and site evaluations by trained certifiers
- d. To achieve greater marketability of farmed, certified SAFE products
- e. Enforce mangrove buffer zones in fishpond development and reforest areas illegally occupied areas
- f. Establish Best Aquaculture Practices and certify farms for compliance
- g. To develop and work for certification of farm areas where schemes will allow farmers, suppliers of farm inputs, processors, buyers (and importers) to respond to consumer need for safe farmed commodities *produced through environmentally and socially sustainable methods of production*

#### **Key Activities:**

- 1) Develop commodity-oriented guidelines for BAP and a certification system for compliance following successful programs in other countries
- 2) Develop BAP using Tap experts from the private sector, academe and other institutions in the development of BAP (Note: why limit BAP development to only the private sector? Can we consider multi-sector and multi-disciplinary approaches here?)
- 3) Strengthen the capability of LGUs in the implementation of BAP through development of appropriate Fishery Ordinance
- 4) Improve coordination of BFAR with DENR on the enforcement of buffer zones and tap the assistance of LGUs
- 5) Utilize GIS as a tool to effectively and efficiently re-establish buffer zones and natural waterways

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop commodity-oriented guidelines for BAP and a certification system for compliance following successful programs in other countries																				
Develop BAP using experts from the private sector, academe, other institutions in the development of BAP																				
Strengthen the capability of LGUs in the implementation of BAP through development of appropriate Fishery Ordinance																				
Improve coordination of BFAR with DENR on the enforcement of buffer zones and tap the assistance of LGUs																				
Utilize GIS as a tool to effectively and efficiently re-establish buffer zones and natural waterways																				

**Organization and Management:**

BFAR will develop commodity-oriented guidelines for BAP and certification systems for compliance

The newly formed Seafood Council in collaboration with DTI, will undertake a 2-year market development program to develop new markets

BFAR, with the support of the LGU, will be responsible for the conduct of on-site training-workshop for fisherfolks on BAP

A workshop will be co-organized by BFAR and DENR to clarify responsibilities and resolve conflicts on the enforcement and management of mangrove buffer zones; SEAFDEC and PCAMRD will provide additional technical inputs; the group will come up with concrete recommendations on how government, LGUs and NGOs can cooperate to better manage the resource.

BFAR, DENR, SEAFDEC, PCAMRD, NAMRIA will coordinate on GIS use

**Performance tracking:**

- 1) Test run guidelines set and modify as needed
- 2) Regularly assess effective set protocols are
- 3) Assess coverage achieved (make adjustments to improve); consider other tools/means
- 4) Continuously upgrade LGU capability through trainings (from BFAR)

- 5) Update regulatory and management measures based on new findings and recommendations (international standards)

**Budget Requirement:**

Item	Amount (in PhP)
Meeting expenses and publication of manual (BAP guidelines)	5,000,000
Consultancy Fees (Private sector BAP experts)	5,000,000
Consultancy and training fees (Strengthening LGU capability)	5,000,000
Meeting expenses (Buffer zones)	1,000,000
Consultancy fees and GIS maps as bases for BFAR/LGU	20,000,000
<b>TOTAL</b>	<b>36,000,000</b>

**Funding Source:**

DTI and Private Sector (thru Seafood Council) will finance services rendered by experts from the private sector in the development of BAP guidelines

LGU funds will be tapped for capacity building activities

BFAR and DENR will fund buffer zone and GIS related activities

**Risks/Uncertainties/Assumptions:**

- 1) Lack of cooperation/appreciation by communities and LGUs
- 2) Linkage breakdown ; Lack of funds
- 3) Training beneficiaries must be properly screened to have a high level of integrity otherwise employers will lose confidence on the program
- 4) Difficulty in reclaiming areas illegally occupied by fishpond development
- 5) Lack of political will on the part of BFAR and DENR to reclaim areas illegally occupied by fishpond development

**Project No. 6**

**Project Title:** Establish standards for quality and implement Farm-based HACCP

**Site/Coverage:** National

**Rationale/Background:**

Recent trends indicate that consumers of traded aquaculture products have influenced choices and preferences, urging major importing countries to impose standards and regulations to ensure food quality and safety. Some of these regulations have also paved the way for farmers to indirectly reduce environmental impacts of production activities.

With standards pertinent to aquaculture (labeling, traceability, antibiotic residues) now in place, various market strategies continue to develop for adoption. These include: (1) product certification; (2) eco-labelling; (3) ethical or “fair trade”; and (4) organic produce, all aimed at improving public image of producers and gaining consumer confidence.

The Philippines should take up the challenge and support implementation of good practices and compliance to quality standards. Facts and figures will have to be gathered and consolidated to serve as guideposts to status and level of compliance of existing farming and ancillary industry activities. Protocols will have to be established (or designed) based on prevailing international codes of conduct/practice. Concerted efforts of regulators (government), industry, the academe and scientific communities and NGOs will have to be effected from initial planning stages down to implementation

**Goals/Objectives:**

- a. Improve on the quality of aquaculture products
- b. Develop and expand the export market with emphasis on quality, food safety, and traceability
- c. To establish product traceability in critical stages in the production cycle
- d. To develop and work for certification of farm areas where schemes will allow farmers, suppliers of farm inputs, processors, buyers (and importers) to respond to consumer need for safe farmed commodities *produced through environmentally and socially sustainable methods of production*
- e. Improve productivity and competitiveness of farmers in the domestic and export markets through the adoption of new technologies and sustainable farming techniques

**Key Activities:**

- 1) Standardize grading system for quality and size
- 2) Provide farm-based HACCP training and certification
- 3) Establish a private-sector led institution (e.g. Seafood Safety Council) that will provide a quality certification system in collaboration with an internationally recognized aquaculture certification body, and attend to quality issues and concerns by the industry
- 4) Train and certify veterinarians on administering aquaculture drugs and medications
- 5) Undertake a public awareness campaign in all sectors of industry on fish quality and quality standards

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Standardize grading system for quality and size	████████████████																			
Provide farm-based HACCP training and certification					████████████████															
Establish a private-sector led institution (e.g. Seafood Safety Council) that will provide a quality certification system in collaboration					████████████████															
Train and certify veterinarians on administering aquaculture drugs and medications									████████████████											
Undertake a public awareness campaign in all sectors of industry on fish quality and quality standards					████████████████															

**Organization and Management:**

- 1) FAB with the support of UPV and BFAR will work on the development of quality standards and farm-based HACCP
- 2) UP AQUASOC with the support of BFAR and APAFMI will provide training to farmers through regional training workshops
- 3) FAB will initiate the organization of the seafood consortium, which will involve key private sector companies, industry support organizations, and government agencies; seafood consortium will later tie-up with an internationally recognized certifying body
- 4) BFAD will provide training to veterinarians while BFAR will certify/accredit veterinarians
- 5) The newly formed Seafood Council in collaboration with DTI, will undertake a 2-year market development program to develop new markets

**Performance evaluation:**

- 1) Continuously monitor degree of compliance of farms
- 2) Regular review set standards with respect to applicability
- 3) Evaluate acceptability (how receptive farmers are)
- 4) Continuously monitor degree of compliance of farms
- 5) Review performance of Council
- 6) Conduct surveys to assess Council's performance/acceptability to fisheries sector as a whole
- 7) Upgrade based on new global standards arising
- 8) Review composition of Council regularly (make adjustments/changes if needed)
- 9) Evaluate acceptability (how receptive farmers are to veterinarians' role)
- 10) Assess effectiveness of campaigns/promotions
- 11) Assess coverage achieved (make adjustments to improve); consider other tools/means

**Budget Requirement:**

Item	Amount (in PhP)
Consultancy fees and publication of manual (Grading System)	5,000,000
Consultancy fees and publication of manual (HACCP/Certification)	10,000,000
Organization of certifying body and seed fund for first 3 years	12,000,000
Training expenses (veterinarians)	5,000,000
Printing and dissemination of information materials	5,000,000
<b>TOTAL</b>	<b>37,000,000</b>

**Funding source:**

BFAR, DTI, and DOST will fund grading systems standardization.

Funds for HACCP-based training and training of veterinarians in drug administration will be provided by BFAR

The Fisheries and Aquaculture Board (FAB) of the Philippines will seek financial assistance from the EU and USAID to help create a Seafood Safety Council

DTI and Private Sector (thru Seafood Council) will source out funds for campaign activities on HACCP

**Risks/Assumptions:**

- 1) Potential for traders to abuse quality standards to reduce buying prices; implementation of HACCP unrealistic for small farms
- 2) Program addresses only potential quality problems at the farm level; does not cover potential hazards after the product leaves the farm
- 3) Additional cost for certification will favor the bigger and well-financed corporate ventures and will likely be discriminatory to small farmers; eventual establishment of multiple certification bodies which will confuse consumers and markets
- 4) Unavailability of funds/investments for this undertaking

**Project No. 7****Project Title:** Rationalize policies on the introduction of live aquatic organisms**Site/Coverage:** National**Rationale/Background:**

Advances in technology have resulted to the development of better strains of farmed aquatic plants and animals which are of better quality, fast-growing, high-yielding and sturdier.

Aquaculture stocks are increasingly used to enhance production in natural waters as degradation of habitats and excessive extraction of fishery stocks continue. There are concerns however which must be addressed when releasing domesticated stocks to natural waters. These relate to genetic and ecological impacts of hatchery-bred stocks on wild stock populations.

Beyond the impact of introduction of exotic species, seed for aquaculture purposes requires characteristics of high survival and optimal performance under culture conditions. These characteristics are products of breeding protocols appropriate for domestication and not for release to the wild. The genetic requirements of stock for release differ from those for domestication. The fitness to survive in the wild is the more important characteristic of seeds for release. Uncontrolled releases of hatchery stocks into the wild may result in introgressive hybridization in wild stocks and eventually into outbreeding depression among genetically diverse wild stock populations.

There are evidences that support the threat of these impacts on natural genetic resources. However, considering the need to enhance declining stocks, there are approaches that can be taken to minimize potential ecological impacts of the introduction of seeds. An example is the release of species native to the water body from where their broodstock originated. A policy and regulatory framework should be developed to ensure more responsible stock enhancement programs

Government needs to prioritize its RD&E programs and rationalize its policies and regulations, particularly on the farming of domesticated and exotic species for the export market. To date, there is a slow development in other critical areas of research and development in the country.

**Goals/Objectives:**

- a. Diversify into other cultivable species of high market potential, particularly in mariculture
- b. Rationalize legislations on importation of commercially important species/strains, most especially for shrimps, and encourage local investments on domestication
- c. Prevent the introduction of new aquatic diseases and pests and preserve natural biodiversity



- 3) UPVCOS-IFPDS will be the lead organization for this project which will involve key government agencies in fisheries and aquaculture, industry support groups, and LGUs
- 4) UP AQUASOC, which is the most experienced NGO in this field, shall undertake this program. It will be working in collaboration with local industry support groups and BFAR regional offices

**Performance tracking:**

- 1) Continuously assess capability (evaluate performance) of trained staff (upgrade if needed, particularly on new areas in advanced technologies)
- 2) Assess/monitor facilities and support systems upgrade if needed)
- 3) Strengthen information networks so trained staff have access to new technology developments
- 4) Ensure that assessors/reviewers (IRA) are updated in regional/global farming and market trends
- 5) Strengthen networks to effect experts exchange
- 6) Periodic evaluation and review (if practical/rational; make adjustments if needed); conduct consultations to aid in assessment
- 7) Conduct surveys and establish feedback mechanisms to assess level of acceptability of new technologies by farmers (monitor farming practices being adopted; note innovations, if any)

**Budget Requirement:**

Item	Amount (in PhP)
Consultancy fees, meetings, and publication of output (import legislation)	5,000,000
Consultancy fees, meetings, and publication of output (business plan)	2,000,000
Consultancy fees, meeting expenses, publication of manual, and maintenance of web page (development of appropriate ordinances)	9,000,000
Information campaign @ P2,000,000/yr x 5 years	10,000,000
<b>TOTAL</b>	<b>26,000,000</b>

**Funding source:**

BFAR will fund public awareness and preparation of business plan

BFAR and respective LGU will seek funds for the development of appropriate ordinance

BFAR/private sector will fund campaign on introductions

**Risks/Assumptions:**

- 1) Entrenched bias of key BFAR personnel against importation of exotics will likely be an obstacle to the success of the program

- 2) Irresponsible traders/importers which will find the new FAO too taxing may resort to illegal importation
- 3) Lack of political will or interest on the part of the LGU to implement BAP, especially if it does not bring any clear benefit
- 4) Lack of available funds from government to support program

### **Project No. 8**

**Project Title:** Promote Aquaculture Development Through Special Economic Zones

**Site/Coverage:** National

#### **Rationale/Background:**

Coastal or municipal fisheries in the Philippines has reached the point of diminishing returns. More and more fishers are chasing after less and less fish. There is a need to reduce fishing pressure to allow the fish resources to recover. This can be done only by encouraging fisherfolks to shift to other means of livelihood. Aquaculture, specifically sea-based aquaculture, beckons as one such alternative. The culture of fish or other marine organisms in the sea will mean giving fisherfolks a livelihood involving the production of the very same commodity, and in the very same environment, they are already familiar with. It can be considered a most logical choice

The productivity of sea cages, particularly those set in deeper waters has already been adequately demonstrated by the few pioneering individuals. Properly regulated as is done in other countries, and with a judicious choice of species, it can be made sustainable. Candidate species for such a venture are milkfish, siganids or rabbitfish and saline-tolerant tilapia. Carnivore species such as seabass, *Lates calcarifer*, or for groupers, *Epinephelus* spp. should not be excluded. In areas where there is a possibility of producing tilapia biomass cheaply using only fertilizers or where there is a seasonal excess of sea-catch, these species may be included.

Milkfish is now the species being cultured in the pioneering sea cages

In the Philippines such a mariculture park already has a legal framework. The Fisheries Code of 1998 requires that aquaculture areas be designated by local governments in case of municipal waters or by the Department of Agriculture for waters located outside municipal waters. Furthermore the appropriate government unit is also required to regulate the stocking density and feeding based on the carrying capacity of an area.

The development of a mariculture park is the best way for LGUs or the national government to implement the said provisions of the law. Without such an infrastructure, mariculture development will be difficult to monitor and regulate and cages will be installed anywhere based purely on market forces without any order to ensure sustainability. In a mariculture park the government can regulate the number and sizes of cages. The distances between cages will be pre-determined by the location of the mooring buoys. Regulating the number of cages is one way of regulating stocking and feeding. Floating wave breakers can be installed to soften the impact of wave action and reduce the risk of damage.

Appropriate sites should be identified based on relative exposure to heavy winds, frequency of typhoons, current direction and proximity to sensitive ecosystem such as a coral reef, as well as navigation. Appropriate policies can be developed as to access to capture fisheries within the mariculture park area. For a start a pilot mariculture park should immediately be designed and installed to determine technical and financial viability. Once found viable this can be scaled up and replicated in other similar areas.

Social preparations shall be required for the target beneficiaries, namely the impoverished fisherfolk. Mariculture will alter their pattern of livelihood. In fishing, the cash inflow is as often as their frequency of going out to sea. In mariculture, cash inflow is realized only after the stock is harvested which could take from four to six months depending upon the species. It is expected that during the first cycle of operations some amount of fishing will still be necessary in order for them to sustain their families.

Technical training on net-cage maintenance, stocking, feeding, size monitoring, harvesting should also be provided. Support services in the form of credit, extension service, cold storage and market linkage will be essential. (Yap, 2002)

**Goals/Objectives:**

- a. Adopt aquaculture as a viable means of reducing fish capture activities, and as a management tool for CRM
- b. Empower LGUs to rationalize its policies on commercial aquaculture investments, with particular consideration on its socio-economic benefits to host fishing communities
- c. Diversify into other cultivable species of high market potential, particularly in mariculture

**Key Activities:**

- 1) Establish a national Authority or government-private sector consortium that will ensure the programmed development of special economic zones consistent with the national agenda
- 2) Promote the development of special economic zones on the regional level based on the suitability of aquatic resources, strengths on specific crops, and access to market
- 3) Establish a legal framework with LGU that will allow investments by local and foreign aquaculture companies on the development and operation of special economic zones
- 4) Tap the support of financial institutions for soft loans; BFAR, SEAFDEC, and DOST for technical support; and private seafood companies for marketing contracts



- 7) Review if newly established fees are affordable (identify flaws if any; make adjustments)
- 8) Strengthen linkages to ensure wide range of possible creditors

**Budget Requirement:**

Item	Amount (in PhP)
Organizational and operational expenses	50,000,000
Consultancy fees, meetings, and publication of output (promotion for the development of regional SEZs)	8,000,000
Consultancy fees, meetings, and publication of output (establishment of legal framework)	3,000,000
Consultancy fees and meeting expenses (Tap financial support)	2,000,000
<b>TOTAL</b>	<b>63,000,000</b>

**Funding Source:**

Government aquaculture/fishery agencies, NGOs, private sector will jointly financed organizational and operational expenses of the Special Economic Zones (SEZs)

Land Bank and NEDA will be tapped for possible loans/grants for the regional development of SEZs

BFAR will provide funds for the establishment of the legal framework with LGUs that will allow investments in SEZs

Land Bank and QUEDANCOR will be tapped for soft loans

**Risks/Assumptions:**

- 1) LGUs may not be very supportive of the idea that the operation of the MLPs will be beyond their control
- 2) Failure to obtain a marketing contract which is necessary for the Land Bank loan
- 3) Ineffective functional mechanism for the collection of fees/implementation of user fee system Valuation study may lead to significantly higher lease fees which will discourage investors. (Note: Valuation studies employ 'willingness-to-pay' methods and the social acceptability factor should be considered already when formulating recommendations. The risk is usually in the dysfunctional implementing mechanism and/or the institution (which ideally should be transparent and payees should trust this institution).
- 4) Failure to obtain a marketing contract which is necessary for the Land Bank loan

**Project No. 9****Project Title:** Empower small holders and fishers in aquaculture**Site/Coverage:** National**Rationale/Background:**

Many fishing villages are now finding fishing an increasingly difficult source of food and livelihood. Yet, this remains their only source of economic activity. This has driven many fishermen to adopt desperate fishing practices, which has further aggravated the decline in municipal fisheries production. In recent years, the rising cost of seafoods and technological advances in aquaculture has made fish farming an economically sound alternative to fish capture. With the country's vast coastline and strategic geographical location for export to Japan, China, Singapore, Hong Kong, Korea, and Taiwan, the prospects for growth and expansion of marine fish farming are enormous.

While fish farming provides great promise as a source of alternative livelihood for fisherfolks, its prohibitive capital and operational requirements make it unrealistic for small farmers. Moreover, small operations lack the economies of scale to be efficient and competitive. Hence, the growth and expansion of fish farming in the Philippines has inevitably favored the larger commercial-scale operators.

Many commercial fish farming ventures now occupy municipal fishing grounds. Sadly, these bring little socio-economic gains to the host communities due to the lack of employment skills, and the failure of LGUs to properly value the water resource for the benefit of displaced fishing communities.

**Goals/Objectives:**

- a. Empower small holders and fishers to carve a sustainable livelihood in mariculture and to be competitive with commercial farmers
- b. Develop "fair trade" marketing channels for fisherfolk farmers

**Key Activities:**

- 1) Package low-input aquaculture technologies suited for small-scale operations (and provide financing support)
- 2) Establish a legal framework with LGU for NGOs, private institutions, and cooperatives to invest on the development and operation of livelihood zones within special economic zones (if existing) specifically for small holders and fishers
- 3) Organize a national NGO that will undertake the development and management of livelihood-type farming operations for fishers and small holders under the concept of a Mariculture Livelihood Park (MLP)
- 4) Establish model MLPs to demonstrate its overall operation, including infrastructure, technology, and financial support; institutionalized marketing; and professionalized management
- 5) Undertake resource valuation as a basis for LGUs to rationalize the socio-economic benefits of commercial aquaculture development to affected fishing communities

- 6) Support fishing communities with training program that will provide them the necessary skills for employment

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Package low-input aquaculture technologies suited for small-scale operations (and provide financing support)	■																			
Establish a legal framework with LGU for NGOs, private institutions, and cooperatives to invest on the development and operation of livelihood zones within special economic zones (if existing) specifically for small holders and fishers	■																			
Organize a national NGO that will undertake the development and management of livelihood-type farming operations for fishers and small holders under the concept of a Mariculture Livelihood Park (MLP)	■																			
Establish model MLPs to demonstrate its overall operation, including infrastructure, technology, and financial support; institutionalized marketing; and professionalized management	■																			
Undertake resource valuation as a basis for LGUs to rationalize the socio-economic benefits of commercial aquaculture development to affected fishing communities	■																			
Support fishing communities with training program that will provide them the necessary skills for employment	■																			

**Organization and Management:**

- 1) SEAFDEC will spearhead and will be supported by key government institutions and the private sector
- 2) UPV-IFPDS will spearhead and will be supported by key government institutions and the private sector
- 3) Cruz Aquaculture Corporation (CAC), which developed and introduced the concept of the MLP, will spearhead the organization of an MLP-NGO, which will be supported by key government institutions and the private sector

- 4) The MLP-NGO, with the support of the host LGU, will operate a model MLP for demonstration use as well as for training
- 5) Private sector consultant (to be identified; consultant will undertake resource valuation of farming centers and provide recommendations on lease fees and “economic incentives” to affected fishers)
- 6) BFAR (BFAR, with the support of the LGU, will be responsible for the conduct a 2 day on-site training-workshop for fisherfolks on BAP)

#### **Performance tracking:**

- 1) Monitor performance of management group (make adjustments if needed)
- 2) Monitor improvements (operations, job generation, development of ancillary industries, etc)
- 3) Monitor results (production volume, viability of technology endorsed, suitability, efficiency of facilities/infrastructure) and make necessary adjustments to ensure improvements
- 4) Assess financial state regularly; conduct budget reviews
- 5) Monitor performance of management group (make adjustments if needed)
- 6) Assess strength of linkages developed with small holders (acceptability of the management group)
- 7) Monitor improvements (operations, job generation, development of ancillary industries, etc)
- 8) Monitor results (production volume, viability of technology endorsed, suitability, efficiency of facilities/infrastructure) and make necessary adjustments to ensure improvements
- 9) Assess financial state regularly; conduct budget reviews
- 10) Assess benefits through regular meetings/consultations among stakeholders
- 11) Review if newly established fees are affordable (identify flaws if any; make adjustments)
- 12) Assess acceptability (feedback mechanisms through surveys/farm visits, etc)
- 13) Regularly provide new info to trained manpower (upgrade if needed)
- 14) Monitor degree of compliance of farms (regular visits/monitoring of facilities and practices)

#### **Budget Requirement:**

<b>Item</b>	<b>Amount (in PhP)</b>
Packaging of low-input technologies @ P1,000,000/technology x 20 technologies	20,000,000
Consultancy fees (Establishment of frameworks)	2,000,000
Organization expenses and seed fund for first 3 years	9,000,000
Establishment of 3 model MLPs @ P10,000,000/MLP (for Luzon, Visayas, and Mindanao)	30,000,000
Establishment of 20 model sites @ P300,000/site	6,000,000
Support to 100 communities x P100,000/ community (training)	10,000,000
<b>TOTAL</b>	<b>77,000,000</b>

**Funding Source:**

Government aquaculture/fishery agencies, NGOs, private sector will jointly support the packaging of low-input technologies, establishment of the legal framework and operations of the MLPs

Land Bank and NEDA will be tapped for financial assistance for the development of MLPs

BFAR will support resource valuation activities for the LGUs

Respective LGUs will allot funds for the training of stakeholders in the communities

**Risks/Assumptions:**

- 1) Funding institutions may not make available non-collateral loans to small holders
- 2) Funding institutions may not make available non-collateral loans to small holders
- 3) LGUs may not be very supportive of the idea that the operation of the MLPs will be beyond their control
- 4) Failure to obtain a marketing contract which is necessary for the Land Bank loan
- 5) Valuation study may lead to significantly higher lease fees which will discourage investors
- 6) Training beneficiaries must be properly screened to have a high level of integrity otherwise employers will lose confidence on the program

## 4.5 Post Harvest Development and Management Sub-sector

### Problem/Issue Context

Responsible fisheries post harvest and marketing typically involve optimum utilization of the catch (from the wild or marine sources) or harvest (from mariculture/aquaculture facilities) through the use of technologies that will ensure the processing and marketing of quality, safe and competitive fish and fishery products. Presently, the Philippine fisheries post harvest sub-sector faces two interrelated central problems, namely: (1) lack of competitiveness, and post harvest losses. There are five main factors that cause the lack of competitiveness of our fish and fishery products. These include high production cost, poor product quality, “unsafe” products, limited new fishery product development activities, and weak marketing strategies. With regard to post harvest losses, not all fish that is harvested for human consumption actually reaches the consumers. Some fish are lost from the distribution chain because of actual physical losses, nutritional losses, or losses in value. Physical or material losses involve fish that are either lost due to spoilage (*i.e.* when the fish becomes inedible) or discarded in fishing vessels and fish landing facilities. Nutritional losses refer to the decrease in the amount of nutrients a human body derives from eating fish that has lost its nutritional value due to inappropriate processing and preservation conditions. Spoilage of wet fish, infestation of dried and smoked fish, weight loss, and inferior finished products are all accompanied by losses in value. In the Philippines (and elsewhere), these post harvest losses occur in four sub-sectors of the fishery industry, namely: in the municipal, commercial, aquaculture and post harvest sub-sectors. The seven projects described below are meant to address the identified these intricately-linked issues.

### Project No. 1

**Title:** Strengthening of the Fish Inspection System in the Philippines

**Site/coverage:** entire Philippines

### Rationale/Background:

Consumers have the right to quality and safe fish and other aquatic products. Hence, it is the responsibility of all the players in the fisheries post harvest sub-sector to adopt appropriate measures and to adhere to rules and regulations that ensure those rights. One effective way of doing this is to guarantee the safety of products and the manufacturing of quality and consistent products that conform to standards and specifications of the market. This can be done through the application of different product safety and quality systems (*e.g.* Hazard Analysis Critical Control Points or HACCP, Sanitation Standards Operating Procedures or SSOP, Good Manufacturing Practices or GMP, Good Hygienic Practices or GHP, Good Laboratory Practices or GLP, etc.) in the entire food industry.

Some fish processors have been continuously improving their fishery products to meet the demands and specifications of the export market. Nevertheless, some of them are still not able to sustain compliance to existing quality systems as imposed by the major importing countries. Proofs to this are the rejection/detention cases that are experienced by some

Philippine fishery products in the export market. The inability of the fish processors to sustain compliance to quality systems does not only affect the quality of the product; it also affects the safety of these products. If these concerns are not properly addressed, there will always be Philippine fishery products that are not competitive in the market. In worst case, such may cause illness, injury or even death in the consumers.

There have been efforts in the past to strengthen the fish inspection system in the Philippines. However, it is still imperative, at this point, that the fish inspection system in the Philippines be further strengthened. This time, this project will be anchored to an efficient institutional framework, for it to differ from previous initiatives.

### **Goal/Objectives:**

The general objective of the project is to improve the quality and safety of fish and other aquatic products in the Philippines in order to enhance their competitiveness both in the local and export markets. Specifically, the project aims:

- 1) To improve the fish inspection system in the Philippines
- 2) To establish an incentive scheme that will encourage local processors to produce quality and safe products

### **Key Activities:**

- 1) Improvement of the fish inspection system in the Philippines

For the Philippines to be recognized in the international market as a reliable source of quality and safe fish and fishery products, it is necessary to improve the fish inspection system in the Philippines. In order to do this, the following activities will be undertaken.

- a. There will be an initiative to rationalize the Fish Inspection Section of the Bureau of Fisheries and Aquatic Resources (BFAR). Activities will include a review of the existing set-up/organizational structure and, if found appropriate, the development of a strategy to improve this set-up (*e.g.* a multi-stakeholder group of qualified inspectors can be formed, inspectors outside BFAR can be tapped, etc.).
- b. Comprehensive training of fish inspectors will be conducted in an attempt to increase their competency.
- c. Other related activities will include the review of the existing product certification scheme and development of a market-oriented fish inspection system.
- d. On site training programs will be conducted and technical services rendered. These training programs will be handled by a group of well-trained trainers and will include the following; (a) comprehensive and site specific training on fish handling (*i.e.* at source, in coastal communities, in fish landing facilities, and in fish processing plants); (b) training on process control protocols and quality systems (*e.g.* GMP, GHP, GLP, HACCP, SSOP, etc.); and (c) industry-based training on how to prepare Philippine fish and other aquatic products for the export market (*e.g.* requirements of the USFDA, EU, Japan, and other countries, new products emerging in the market, consumer trends and preferences, etc.).
- e. Research, development and extension (RDE) activities on assessment, regulation and control of bio-contaminants will likewise be conducted. This is an attempt to minimize the

incidence of rejections/detentions of Philippine fish and fishery products in the export markets.

- f. A national center for product analyses and satellite testing centers will be established. These centers will house up-to-date high precision equipment and other facilities that will help ensure the compliance of the Philippine fish and fishery products to the quality and safety requirements of importing countries. This center will be provided with the necessary institutional support facilities and will be manned by competent individuals. Private sector initiatives on putting up of testing centers will also be highly encouraged.
- 2) Establishment of an incentive scheme that will encourage local processors to produce quality and safe products

One way to encourage local processors to produce quality and safe fish and other aquatic products is to provide them with a beneficial incentive scheme. The establishment of this scheme will involve the development of valid and reasonable criteria for accreditation of companies, institution of the industry's "seal of excellence", and the provision of incentives (*e.g.* tax incentives, promotion of products in international expositions, exhibits and fairs, etc.) to quality and safety compliant establishments.

#### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
a. Improvement of the fish inspection system in the Philippines																				
- Rationalization of the Fish Inspection Section of BFAR																				
- Comprehensive training of fish inspectors																				
- Review of existing product certification scheme and development of a market-oriented fish inspection system																				
- On-site training programs and technical services to the industry																				
- RDE activities on bio-contaminants																				
- Establishment of a national testing center and satellite testing centers																				
b. Establishment of an incentive scheme																				
- Development of valid and reasonable accreditation criteria																				
- Institution of the industry's "seal of excellence" and provision of incentives																				

**Organization and Management:**

Activities	Implementing Agency	Collaborating Agencies
a. Improvement of the fish inspection system in the Philippines		
- Rationalization of the Fish Inspection Section of BFAR	BFAR	BFAD, FDC, Private Sector
- Comprehensive training of fish inspectors	BFAR	FDC, SGS, Private Sector
- Review of existing product certification scheme and development of a market-oriented fish inspection system.	FDC	BFAR, BFAD, Private Sector
- On-site training programs and technical services to the industry	BFAR	FDC, UPV-CFOS, UPD-CHE, Private Sector,
- RDE activities on bio-contaminants	BFAR-NFRDI	UPV-CFOS, UPD-MSI
- Establishment of a national testing center and satellite testing centers	BFAR	BFAR-RO, UPV-CFOS, UPD-NSRI, DOST-NFRI
b. Establishment of an incentive scheme		
- Development of valid and reasonable accreditation criteria	BFAR	DTI, NGO, Private Sector
- Institution of the industry's "seal of excellence" and provision of incentives	BFAR	DTI, DFA, NGO, Private Sector

**Performance Tracking:**

Activities	Expected Output	What to Monitor	When to Monitor	Who to Monitor
a. Improvement of the fish inspection system in the Philippines	Efficient and competent fish inspection system in the Philippines	Monitoring of: -local volume and sales of fish and fishery products. -production of high quality, safe and competitive fish and fishery products -rejection/ detention cases in the export market -increase in the number of HACCP-accredited FPE	At the start and end of each activity	BFAR, BFAD, DTI
b. Establishment of an incentive scheme	Increase in the number of safety and quality system compliant FPE	Monitoring of: -production of high quality, safe and competitive fish and fishery products -increase in the number of FPE with "seal of excellence"	At the start and end of each activity	BFAR, DTI

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	5,000,000
Maintenance and Other Operating Expenses	8,000,000
Capital Outlay	20,000,000
<b>TOTAL</b>	<b>33,000,000</b>

**Funding Source:**

Activities	Target Funding Agencies
a. Improvement of the fish inspection system in the Philippines	
- Rationalization of the Fish Inspection Section of BFAR	FAO, UNDP
- Comprehensive training of fish inspectors	EU-Small Project Facilities
- Review of existing product certification scheme and development of a market-oriented fish inspection system.	FAO, UNDP
- On-site training programs and technical services to the industry	EU-Small Project Facilities
- RDE activities on bio-contaminants	DA-BAR, DOST
- Establishment of a national testing center and satellite testing centers	USAID, AusAID, ADB, JICA
b. Establishment of an incentive scheme	
- Development of valid and reasonable accreditation criteria	FAO, UNDP
- Institution of the industry's "seal of excellence", and provision of incentives	GOP

**Risks/Assumptions:**

1. Trade barriers and technological breakthroughs may contribute to high uncertainty.

**Project No. 2**

**Title: Development of National Quality Standards for Fish and Fishery Products**

**Site /coverage:** entire Philippines

**Rationale/Background:**

National safety and quality standards are basic prerequisites in protecting the health and well-being of the consumers, both here in the country and abroad. Such standards are also needed in safeguarding the interest of the sub-sector. Without these systems, there will be no means of ensuring safety of products, and the manufacturing of quality and consistent products that conform to standards and specifications of the market.

Presently, the Philippine fish and fishery products find it difficult to compete both in the local and export market. Such perceived uncompetitiveness of Philippine fish and fishery products could possibly be due to the fact that the country does not have a set of minimum quality and safety requirements. The quality and safety standards, as indicated in the different Fisheries Administrative Orders (*i.e.* FAO 195, 210, and 211), are generally based on the standards prescribed by the FAO/WHO-Codex Alimentarius Commission. The lack of science-based national quality criteria and safety standards for Philippine fish and fishery products makes it imperative for these products to conform to international standards. Such must be based on analyses of products from the developed countries. Hence, it is necessary that national quality and safety standards be established in the Philippines in order to provide local processors clear guidelines on the level of quality and safety for their products.

**Goal/Objectives:**

The general objective of the program is to improve the quality and safety of fish and other aquatic products in the Philippines. Specifically, the project aims:

- 1) To develop the national quality standards for fish and other aquatic products
- 2) To come up with policy guidelines for the exportation and importation of different fish and other aquatic products

**Key Activities:**

- 1) Development of national quality standards for fish and other aquatic products for local consumption, for export, and for imported goods

Activities will be focused on the development of quality criteria and requirements for different fish and other aquatic products. This will be done through a comprehensive review of existing guidelines, international quality criteria and requirements, processing methodologies. Past and existing research and development activities on the development of quality standards and process standardization will likewise be considered.. If necessary, research and development projects will be conducted to develop quality standards for, and to standardize the processing of some of the products that were not given attention in previous works in the country. In the end, brochures containing the National Quality

Standards (NQS) for different fishery commodities will be produced. Further, a series of regional and national consultation will be conducted for the proper dissemination of information on the NQS.

- 2) Development of policy guidelines for the importation and exportation of fish and other aquatic products

The present FAOs, (No. 195 and 210) are limited to the rules and regulations on the importation (FAO 195) and exportation (FAO 210) of chilled/frozen fish and fishery/aquatic products. Hence, it is necessary to come up with the necessary policy guidelines for the importation and exportation of other products (*e.g.* canned, bottled, dried, smoked, marinated, fermented, etc.). Activities to achieve this aim will include the drafting of the pertinent FAO, to include the information, as determined in the above item.

#### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
a. Development of NQS for fish and other aquatic products																				
- Comprehensive review of existing guidelines, international quality criteria/ requirements, processing methodologies, and past/ existing RDE activities on the development of quality standards and process standardization																				
- RDE activities on development of quality criteria and product standardization																				
- Production of brochures on NQS for different commodities																				
- Regional and national consultation on the NQS																				
b. Development of policy guidelines for the importation and exportation of fish and other aquatic products																				

**Organization and Management:**

<b>Activities</b>	<b>Implementing Agency</b>	<b>Collaborating Agencies</b>
a. Development of national quality standards for fish and other aquatic products		
- Comprehensive review of existing guidelines, international quality criteria/ requirements, processing methodologies, and past/ existing RDE activities on the development of quality standards and process standardization	BFAR	DA-BAFPS, UPV-CFOS, DOST-ITDI, DOST-NFRI
- RDE activities on development of quality criteria and product standardization	BFAR	UPV-CFOS, UPV-MSI
- Production of brochures on National Quality Standards (NQS) for different commodities	BFAR	UPV-CFOS, DOST-ITDI, DOST-NFRI, UPD-MSI
- Regional and national consultation on the NQS	BFAR	BFAR-RO, DA-BAFPS, LGU, Private Sector
b. Development of policy guidelines for the importation and exportation of fish and other aquatic products	BFAR	DA-BAFPS, UPV-CFOS, DOST-ITDI, DOST-NFRI, UPD-MSI, Private Sector

**Performance Tracking:**

<b>Activities</b>	<b>Expected Output</b>	<b>What to Monitor</b>	<b>When to Monitor</b>	<b>Who to Monitor</b>
a. Development of NQS for fish and other aquatic products	Publication and implementation of the Philippine NQS	Monitoring of: -status of the comprehensive review and RDE activities -proper production of IEC materials on the NQS -proper conduct of regional and national consultations on the NQS	At the start and end of each activity	BFAR

Activities	Expected Output	What to Monitor	When to Monitor	Who to Monitor
b. Development of policy guidelines for the importation and exportation of fish and other aquatic products	FAOs on importation and exportation of most of the fish and fishery products in the Philippines	Monitoring of: -production of appropriate FAOs on the importation and exportation of most of the fish and fishery products in the Philippines	At the start and end of each activity	BFAR

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	1,150,000
Maintenance and Other Operating Expenses	3,000,000
Equipment Outlay	350,000
<b>TOTAL</b>	<b>4,500,000</b>

**Funding Source:**

ACTIVITIES	Target Funding Agencies
a. Development of NQS for fish and other aquatic products	
- Comprehensive review of existing guidelines, international quality criteria/ requirements, processing methodologies, and past/ existing RDE activities on the development of quality standards and process standardization	UNDP
- RDE activities on development of quality criteria and product standardization	UNDP, ODA
- Production of brochures on National Quality Standards (NQS) for different commodities	UNDP, ODA
- Regional and national consultation on the NQS	UNDP, ODA
b. Development of policy guidelines for the importation and exportation of fish and other aquatic products	GOP

**Risks/Assumptions:**

1. Trade barriers and technological breakthroughs may contribute to high uncertainty.

**Project No. 3****Title: Marketing and Promotion of Philippine Fish and Other Aquatic Products**

**Site/ coverage:** entire Philippines

**Rationale/Background:**

Fish in the Philippines are typically marketed in retail quantities. This is directly done in the traditional landing sites by the municipal fishers and in the local wet market by some middlemen. Majority of the catch of commercial fishers is traditionally traded in landing sites in wholesale qualities. In most cases, is transported to major fish ports for auctioning. Most of the aquaculture produce is either auctioned on site or is transported to major fish ports for auctioning. Those who engage in on-site bidding are middlemen and fish exporters. Bidding in fish ports is typically for middlemen, fish vendors in the local wet markets, and small fish processors. For fishery products in the Philippines, majority of the traditional products (*e.g.* smoked, dried, salted, fermented and marinated) are traded in most of the wet markets all over the country. Some products, such as canned/bottled fish and fishery products, frozen fish and a limited number of value added products are now in the shelves of large supermarket chains in the Philippines. With regard to export products, the Philippines has Japan and the USA as traditional export markets. Notwithstanding, Philippine fish and fishery products are now available in most Asian countries and in some European countries.

Although it cannot be denied that some of the Philippine fish and fishery products can compete with other products both in the international and domestic market, weak marketing strategies for some of these products limit their market acceptability. For example, in the domestic market, the trading centers and transport facilities are not enough to provide competent marketing systems for the trading of fish and fishery products in the country. Therefore, there is a need to strengthen existing marketing network that can help in the immediate and proper distribution of fish and fishery products in the country. This problem is even exacerbated by the poor condition of the transport and infrastructure facilities in the country. In addition, promotion of Philippine fish and fishery products both in the domestic and international market is also limited.

Indeed, it is still necessary at this point to tap other markets and create a niche for some of the Philippine fish and fishery products. The adoption of the “from the farm to the table” approach in fisheries post harvest does not only require responsible handling and processing of fish and fishery products. It also demands marketing systems that effectively link the production and consumption of fish and fishery products. At the same time, these systems will have to ensure that the consumers are provided with quality and safe products in their dinner tables.

Hence, it is important to have a project that is specifically designed to develop the market and marketing systems for the Philippine fish and fishery products. This is in attempt to increase the sales of these products and to enhance their competitiveness both in the

international and domestic markets while providing the consumers with quality and safe products.

**Goal/Objectives:**

The project aims to develop market and market systems for effective linkage between production and consumption of fish and other aquatic products in the Philippines. Specifically, the project aims:

- 1) To increase the market opportunities for Philippine fish and fishery products
- 2) To establish a systematic approach to the marketing and promotion of Philippine fish and fishery products
- 3) To ensure the marketing of products known to be in compliance with all fishery conservation and food quality and safety laws and regulations
- 4) To develop a system that will improve the traceability of fish and other aquatic products that are traded both in the international and domestic market

**Key Activities:**

- 1) Systematic approach to the marketing and promotion of Philippine fish and fishery products

For the Philippine fish and other aquatic products to be more visible both in the local and international market, strategies will be developed for effective marketing and promotion of Philippine fish and other aquatic products. There will be government-initiated activities that will include the following.

- a. There will be production of Information, Education and Communication (IEC) materials. The contents of these IEC materials will be drawn from available scientific and technical information for the different products. This is an attempt to promote the benefits of consuming fish and other aquatic products. In addition, there will be organized information dissemination system that will encourage the use of appropriate packaging materials and methods for the different fish and other aquatic products. This will be accompanied by the strict implementation of packaging regulations in the country and the observance of truth in labeling the products. In addition, eco-labeling systems will be established in order to assure the consumers that the Philippine fish and other aquatic products are produced in an environmentally friendly manner.
- b. A system that will improve the traceability of fish and other aquatic products that are traded both in the international and domestic markets will be developed. In this system, information regarding the origin, date and time of harvest or capture, and the various stages of processing and change of ownership must be well documented. Such information will partly be used in the promotion of products from the Philippines as safe and globally competitive products.
- c. For the marketing of the products in the local market, festive caravans will be organized and will target specific market sites (*e.g.* malls, local supermarkets, etc.).
- d. For the international market, priorities will be given to the products of companies that are consistently compliant with the product safety and quality systems and therefore are awarded the “seal of excellence” (as per the incentive scheme proposed under Project No.1 entitled “Strengthening of the Fish Inspection System in the Philippines”).

These products will be promoted by the Philippine government in different seafood expositions, trade fairs and exhibits outside the Philippines.

2) Strengthening of marketing networks

To showcase the different Philippine fish and fishery products, efficient marketing networks will be organized in the country. Activities to achieve this aim will include the following.

- (1) Strategically located trading centers for display and promotion of fish and fishery products from different parts of the country will be established. These will serve as model trading centers where honest trade practices will be observed, as well as efficient service to consumers will be provided. Only quality and safe products will be traded, and effective market matching transactions for the products will be done. The centers will also serve as the anchor point for municipal fishers to get better price for their catch, and for small processors to enable them to expose their products to a bigger market.
- (2) Production of one ethnic product per region will be encouraged. This is to come up with a list of different ethnic products that can be showcased in the trading centers. From this list, it is possible that, through a good marketing and promotion campaign, a product or several products that can create a niche both in the international and domestic markets will emerge.
- (3) Networking between the different trading centers, as organized in item (1) will be institutionalized. This is to provide exchange of products from different areas in the Philippines and to provide the Filipino consumers with varied forms of fishery products at more affordable cost.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
a. Systematic approach to the marketing and promotion of Philippine fish and fishery products																				
- Production and dissemination of IEC materials																				
- Improvement of traceability system																				
- Intensive promotion of fish and fishery products in the domestic market																				
- Intensive promotion of fish and fishery products in the international market																				

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
b. Strengthening of marketing networks																				
- Strengthening of existing market networks and establishment of new strategically located trading centers																				
- Establishment of the “one product one region” scheme																				
- Networking of new trading centers																				

**Organization and Management:**

Activities	Implementing Agency	Collaborating Agencies
a. Systematic approach to the marketing and promotion of Philippine fish and fishery products		
- Production and dissemination of IEC materials	BFAR	DTI, DA-PFDA, UPV-CFOS, Private Sector
- Improvement of traceability system	BFAR	UPV-CFOS, SGS, Aquaculture Board
- Intensive promotion of fish and fishery products in the domestic market	BFAR	DTI, DOT, Private Sector
- Intensive promotion of fish and fishery products in the international market	BFAR	DTI, DFA, DOT, Private Sector
b. Strengthening of marketing networks		
- Strengthening of existing market networks and establishment of new strategically located trading centers	DA-PFDA	BFAR-RO, DTI, NGO, Private Sector, LGU
- Establishment of the “one product one region” scheme	BFAR, DTI	BFAR-RO, DTI, NGO, Private Sector
- Networking of new trading centers	DA-PFDA	BFAR-RO, DTI, NGO, Private Sector, LGU

**Performance tracking:**

Activities	Expected Output	What to Monitor	When to Monitor	Who to Monitor
a. Systematic approach to the marketing and promotion of Philippine fish and fishery products	Efficient and competent marketing and promotion of Philippine fish and fishery products	Monitoring of: -local volume and sales of fish and fishery products. -conduct of promotional activities for fish and fishery products	At the start and end of each activity	BFAR, DA-PFDA, DTI
b. Strengthening of marketing networks	Effective networking between trading centers in the Philippines Promotion of one product per region	Monitoring of: -networking schemes between trading centers -creation of new niche in the market	At the start and end of each activity	BFAR, DA-PFDA, DTI

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	3,345,000
Maintenance and Other Operating Expenses	18,255,000
Equipment Outlay	60,400,000
<b>TOTAL</b>	<b>82,000,000</b>

**Funding Source:**

Activities	Target Funding Agencies
a. Systematic approach to the marketing and promotion of Philippine fish and fishery products	
- Production and dissemination of IEC materials	FAO, UNDP, ODA
- Improvement of traceability system	EU-Small Project Facilities
- Intensive promotion of fish and fishery products in the domestic market	FAO, UNDP, ODA
- Intensive promotion of fish and fishery products in the international market	FAO, UNDP, ODA, EU, USFDA
b. Strengthening of marketing networks	
- Strengthening of existing market networks and establishment of new strategically located trading centers	USAID, FAO, ADB, JICA
- Establishment of the “one product one region” scheme	DTI, DOT
- Networking of new trading centers	USAID, FAO, ADB, JICA

**Risks/Assumptions:**

- 1) Trade barriers and technological breakthroughs may contribute to high uncertainty
- 2) Currency devaluation may pose problem

**Project No. 4****Title: Development of New Value Added Fishery Products**

**Site /coverage:** entire Philippines

**Rationale/Background:**

There has been an explosion of new product activities worldwide in the last several years. The food industry, in particular, continuously introduces a staggering number of new and varied food products to the consumers each year. This clearly indicates that the demand for these new products is strong and growing, while conventional processed products have been creating an old-fashioned image among consumers. In the local front, for our local seafood processors to face today's competitive business environment, their efforts should now be geared towards the development and the introduction of new products that meet the ever-increasing sophistication of today's market. Candidate species to these new product development activities include some aquaculture commodities (e.g. milkfish, tilapia, shrimps, etc.) and seaweed (e.g. *Codium* spp., *Caulerpa* spp., *Gracilaria* spp., etc.).

New fishery products must be considered as the key ingredients to the Philippines' current and future plans. Essentially, these new fishery products will serve as the "lifeblood" of our local seafood processors. To stay ahead of the competition, priority must be given, in terms of budget allocation to: (1) new fishery product development efforts through creation of new products and modification of existing products; (2) profit improvement through reformulation, as well as process and package changes; and (3) utilization of solid and water waste from fish processing establishments.

**Goal/Objectives:**

The main objective of the project is to develop globally competitive value added fishery products. Specifically, the project aims to:

- 1) To use a systematic, consumer-oriented scheme in new fishery product development
- 2) To develop new fishery product using aquaculture commodities and seaweeds
- 3) To reposition in the market the existing products from the fishing communities through re-designing of packaging and product reformulation
- 4) To conduct research and development activities on proper utilization of water and solid wastes from fish processing establishments.

**Key Activities:**

- 1) Research and Development projects on the use of aquaculture commodities and seaweeds in the development of novel fishery products for the export market

Effort must be geared towards development of new fishery products that are significantly different from the products that are now available in the market. These new product development activities must be consumer-oriented and market-driven. These may be done through either of the following:

- a. Product Diversification - This refers to the use of different technologies in order to come up with different fishery products using a particular fish species. For example, using one particular fish species, diversified products can be developed using different appropriate processing methodologies.
  - b. Value Addition - This pertains to the transformation of a fish and other aquatic resource into new, varied, high quality delicacies, or simply, into appetizing specialties. This involves the development of new products to meet the exacting specifications and requirements of the consumers, both in the local and international markets.
- 2) Re-design of packaging and product reformulation of a select number of fishery products from the different regions in the Philippines

There is a good number of fishery products in the different regions in the Philippines that can be repositioned in the market. Repositioning refers to the introduction of an evolutionary step beyond a current product. This may include changes in the physical products, as well as the changes in the communication that the consumers receive about the new product. In so doing, the new products can either be viewed in a new light, used by a new group of consumers, used in a different way by the current group of consumers, or used in the same way by the current group of consumers but with great satisfaction. In here, the repositioned products retain the original name of the product and the basic physical products usually remain the same. Product repositioning can be done through:

- a. Redesign of Packaging - This refers to the changes in packaging system and design in order to improve the existing products. These changes in the packaging design can be aimed to increase sales.
  - b. Product Reformulation - The consumption pattern may vary depending on food habits and attitudes of consumers. Many products are reformulated from time to time to meet new consumer desires. For example, health conscious consumers prefer low-sodium, low caloric food items. As such, some dried fish in the regions can be reformulated to meet the demand of this type of consumers.
- 3) Research and development activities on proper utilization of water and solid wastes from fish processing establishments.

Research and development activities on proper utilization of waste can be categorized into two.

- (1) Utilization of water and solid wastes as the material for the extraction of potentially bio-active substances that may have a wide variety of industrial, food, and biotechnological applications. This is of significance for two reasons. First, screening of wastes for potential natural, bio-active compounds is a good first step in an inventory of the existing natural resources in the Philippines that can be used as raw material for the extraction of bio-active compounds. Secondly, the utilization of water and solid waste from processing plants is in line with effective waste management strategies that are important to protect our environment from the risks associated with these solid wastes.
- (2) Exploration of other uses of solid waste from fish processing plants in order to come up with novel fishery products (*e.g.* value added products from tuna processing wastes, powdered seasonings from shrimp processing wastes, etc.)

#### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
a. RDE activities using aquaculture species and seaweed																				
b. Redesign of packaging and product reformulation of a select number of fishery products from different regions in the country																				
c. RDE activities on proper utilization of wastes from FPE																				
- Utilization of wastes in the extraction of potentially bio-active substance																				
- Exploration of use of solid waste from FPE to come up with new products																				

#### Organization and Management:

Activities	Implementing Agency	Collaborating Agencies
a. RDE activities using aquaculture species and seaweed	BFAR-NFRDI	UPV-CFOS, UPD-CHE, DOST-FNRI, DOST-ITDI, Private Sector
b. Redesign of packaging and product reformulation of a select number of fishery products from different regions in the country	BFAR-NFRDI	UPV-CFOS, UPD-CHE, DOST-FNRI, DOST-ITDI, Private Sector

Activities	Implementing Agency	Collaborating Agencies
c. RDE activities on proper utilization of wastes from FPE		
- Utilization of wastes in the extraction of potentially bio-active substance	BFAR-NFRDI	UPV-CFOS, UPD-MSI, Private Sector
- Exploration of use of solid waste from FPE to come up with new products	BFAR-NFRDI	UPV-CFOS, UPD-MSI, Private Sector

**Performance Tracking:**

Activities	Expected Output	What to Monitor	When to Monitor	Who to Monitor
a. RDE activities using aquaculture species and seaweeds	Increase in the number of new value added products using aquaculture species and seaweeds	Monitoring of: -new product development activities -activities if they are consumer oriented and market driven	At the start of each activity	BFAR, Private Sector
b. Redesign of packaging and product reformulation of a select number of fishery products from different regions in the country	Reformulated and redesigned fishery products from the different regions	Monitoring of: -activities that will identify potential products for reformulation / redesign -level of quality of different fish and fishery products	At the start and end of each activity	BFAR, BFAR-RO, Private Sector
c. RDE activities on proper utilization of wastes from FPE	Increase in the number of new fishery products and products of pharmaceutical application	Monitoring of: -production of novel value added fishery products -environment-friendly technologies in the extraction of bio-active substances	At the start and end of each activity	BFAR-NFRDI

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	2,520,000
Maintenance and Other Operating Expenses	7,680,000
Capital Outlay	1,800,000
<b>TOTAL</b>	<b>12,000,000</b>

**Funding Source:**

Activities	Target Funding Agencies
a. RDE activities using aquaculture species and seaweeds	EU-Small Project Facility, DOST-PCIERD, DA-BAR, Private Sector
b. Redesign of packaging and product reformulation of a select number of fishery products from different regions in the country	EU-Small Project Facility, DOST- PCIERD, DA-BAR, Private Sector
c. RDE activities on proper utilization of wastes from FPE	
- Utilization of wastes in the extraction of potentially bio-active substance	FAO, UNDP, JICA, DA-BAR, DOST, Private Sector
- Exploration of use of solid waste from FPE to come up with new products	FAO, UNDP, JICA, DA-BAR, DOST, Private Sector

**Risks/Assumptions:**

1. Technological breakthroughs will be positive factors
2. Currency devaluation may pose problem

**Project No. 5**

**Title:** Natural Marine Products

**Site /coverage:** entire Philippines

**Rationale/Background:**

The world's greatest concentration of marine species occurs within the so-called East Indies Triangle that is formed by the Philippines, the Malay Peninsula, and New Guinea. One can find in this small triangle more species in almost every family of marine, tropical organisms than anywhere else in the world. In the Philippines, its vast marine resources have long been exploited. Nevertheless, these marine resources have not been tapped properly as potential sources of natural products.

The real potential of marine organisms in the Philippines is not well established. While some of these organisms in the country have long been commercially exploited, characterization of some of marine organisms with no perceived commercial value, in terms of their potential as a good natural source of micro and macro nutrients and bioactive substances is very limited in the country. Little is known about the promise of the Philippine species as a important natural sources of proteins, carbohydrates, and different vitamins, minerals and free amino acids. The potential bioactive substances that may have a wide variety of industrial, food, pharmaceutical, nutraceutical and biotechnological applications are largely unknown. While the nutritive values of important marine organisms in other countries are well-documented, there is limited information

about the characteristics of the Philippine marine organisms that make them an important source of natural products.

Hence, the proposed project is designed to characterize and screen several marine organisms from the Philippine waters, in terms of their potential as good sources of micro and macronutrients, and as raw material for the extraction of natural products. This project is of significance because of the following reasons. First, this will provide detailed important information about the potential of these species as a cheap natural source of proteins, carbohydrates, and different vitamins, minerals and free amino acids to the Filipinos. Secondly, screening of different marine species for potential natural, bioactive compounds is a good first step in an inventory of the existing natural resources in the Philippines that can be used as raw material for the extraction of bioactive compounds. Thirdly, the characterization of Philippine marine organisms is an important step in better resource identification in the country. Finally, this project is an important alternative step to increasing fisheries production in the country without exerting any added fishing pressure to the resource.

### **Objectives:**

The general objective of the project is to describe several species of Philippine marine organisms in terms of their potential as raw material for the extraction of natural, bioactive substances. Specifically, it aims:

- 1) To determine the micro- and macro-nutrients in several species of Philippine marine organisms in order to showcase their importance as a table food.
- 2) To screen different species of marine organisms for potential natural, bioactive compounds through a screening protocol that will involve stepwise extraction and characterization of extracts.
- 3) To come up with a comprehensive list of different species of Philippine marine organisms that show potential as a food item and as raw material for the extraction of potential natural, bioactive compounds.

### **Key Activities:**

The project will be divided into two phases. Phase 1 will involve the cataloging of different Philippine marine organisms that are both traditionally and non-traditionally eaten. This list will include their sources, distribution, and present market values. Also included in Phase 1 is the standardization of laboratory protocols on the determination of micro and macronutrients in different marine organisms, including proximate composition (*i.e.* protein, lipid, ash and carbohydrates, both non-fibrous and fibrous), free and bound amino acids, fatty acids, minerals, and some vitamins. This will be followed by routine analyses and/or characterization of different species of marine organisms.

Phase 2 will involve the preliminary screening of some marine organisms for natural bioactive products. This is an attempt to come up with an initial list of candidate compounds from these species. This will then be followed by routine screening for the bioactive compounds using different species in terms of the following: steroids, carboxylic

and sulfated carbohydrate contents, bioactive fatty acids, and the alcoholic components of the marine organisms.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
a. Cataloging of different Philippine marine organisms																				
b. Preliminary/Routine screening of some marine bioactive products																				

**Organization and Management:**

Activities	Implementing Agency	Collaborating Agencies
a. Cataloging of different Philippine marine organisms	BFAR-NFRDI	UPV-CFOS, UPD-CHE, DOST-FNRI, DOST-ITDI, Private Sector
b. Preliminary / Routine screening of some marine organisms for natural bioactive products	BFAR-NFRDI	UPV-CFOS, UPD-CHE, DOST-FNRI, DOST-ITDI, Private Sector

**Performance Tracking:**

Activities	Expected Output	What to Monitor	When to Monitor	Who to Monitor
a. Cataloging of different Philippine marine organisms	A complete list of Philippine marine resources	Monitoring of: - cataloging activities	At the start of and end of the activity	BFAR, Private Sector
b. Preliminary / Routine screening of some marine organisms for natural bioactive products	Increase in the number of new natural products	Monitoring of: -activities that will identify potential natural products	At the start and end of activity	BFAR, BFAR-RO, Private Sector

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	2,520,000
Maintenance and Other Operating Expenses	7,680,000
Capital Outlay	1,800,000
<b>TOTAL</b>	<b>12,000,000</b>

**Funding Source:**

Activities	Target Funding Agencies
a. Cataloging of different Philippine marine organisms	BFAR-In House
b. Preliminary / Routine screening of some marine organisms for natural bioactive products	DOST- PCIERD, DA-BAR, Private Sector

**Risks/Assumptions:**

1. Technological breakthroughs will be positive factors
2. Currency devaluation may pose problem

**Project No. 6****Title: Reduction of Fisheries Post Harvest Losses**

**Site /coverage:** entire Philippines, 4 fisheries sub-sectors

**Rationale/Background:**

The need to improve the system of getting fish from the water to the consumer is very apparent since not all fish that is harvested for human consumption actually reaches the consumers. Approximately 25% of the total fish production in most developing countries, including the Philippines, is lost from the distribution chain because of either, or all of, the following: (1) actual physical or material losses, such as discard of by catch in fishing vessels and spoiled/inedible fish in landing facilities; (2) nutritional losses or the decrease in the amount of nutrients a human body derives from eating fish that has lost its nutritional value; and (3) losses in value due to spoilage of wet fish, infestation of dried and smoked fish, weight loss, and inferior finished products. In the Philippines (and elsewhere), these post harvest losses occur in four sub-sectors of the fishery industry, namely: in the municipal, commercial, aquaculture and post harvest sub-sectors.

Reduction of post harvest losses can benefit the fishery industry in a number of ways. For example, reduction of losses can be accompanied by an increase in the amount of quality fish that can reach the consumers. Subsequently, there can be reduction of pressure on fish resource since there will not be any unnecessary increase in production volume. There can also be increased income to the players of the fishery industry, such as the municipal and commercial fishers, aquaculturists, and fish retailers and processors. Since less fish is

wasted, there will be less spoiled fish and fish processing waste that is disposed into the environment. Consequently, the environmental impact may be reduced significantly.

Hence, in order to enjoy these benefits and to bridge the gap between demand and production, a project that will focus on the reduction of fisheries post harvest losses in the Philippines becomes imperative.

**Goal/Objectives:**

The project is designed to enhance the performance efficiency in fisheries post harvest handling and processing. Specifically, the project aims:

- 1) To reduce post harvest losses in four sub-sectors of the fisheries industry, namely: the municipal, commercial, aquaculture and post harvest sub-sectors.
- 2) To standardize the fish processing methodologies in the fishing communities and in fish processing establishments

**Key Activities:**

- 1) Reduction of post harvest losses in four sub-sectors of the Philippine fishery industry using the “Cold Chain System”

Although it is generally recognized that the extent of losses in the commercial and municipal fisheries sub-sectors is very difficult to quantify, there is still a need to have a comprehensive assessment of the existing practices and estimated volume of physical losses due to deliberate discard of accidental catch (or by catch). This information, among other things, will be used in developing a working model system for the reduction of these losses.

Relevant policy and regulatory measures will be instituted in order to control some fishing practices, such as the following: (1) catch of small and immature species that are sold at relatively lower prices than the mature individuals, as well as the catch of gravid individuals of some finfish species using trawl (Armada 2004; Ingles 2004; Ganaden and Stequert 1987); (2) intentional catching of larval and juvenile species that are used in the processing of some ethnic products, such as frozen goby fry (*Sicyopterus* sp.), fermented or dried “padas” (the early juveniles of rabbitfish, *Siganus canaliculatus*), and frozen “lobo-lobo” (postlarvae or early juveniles of *Stolephorus* sp.) (Hermes 2004); (3) the catch of live fish for the so-called “Live Reef Food Fish Trade” or LRFFT (Mamaug 2004), which in some cases makes use of sodium cyanide to temporarily stun the fish during collection .

Strategies will be developed on how can the players in the fishery industry comply with the so-called “cold chain system”. These may include all, or a combination of any, of the following: (1) one is an assessment of the post harvest practices in the four fisheries sub-sector (i.e. commercial, municipal, aquaculture and post harvest sub-sectors) will be conducted. Two, there will be an appraisal of the needs of the sub-sectors with regard to ice making/plant, ice storage, freezing and cold storage facilities and the provision of appropriate institutional facilities and support system. three, there will be an intensive

information dissemination campaign among fish handlers on how to properly treat or handle the fish immediately after catch (as in the case of commercial and municipal fishers) or harvest (as in the case of fish from aquaculture). This include unloading in fish ports and other landing sites, when trading wet fish especially in wet markets and in major fish port complexes and municipal fish ports, or upon receipt of, and when processing, fish in processing plants. Four is an assessment of the post production storage and distribution systems in the Philippines will be conducted.

- 2) Standardization of fish processing methodologies to reduce post harvest losses and to come up with high quality and consistent products.

Except for the fishery products for the export market, most of the fishery products that are locally marketed in the Philippines are processed using non-standardized protocols. This is especially true for those fishery products that are processed using traditional methodologies. This component of the project will therefore involve a cataloging of all fishery products and processing methodologies in the country. The information from the generated lists will be comprehensively reviewed in order to come up with meaningful and sustainable intervention strategies that are related to reduction of post harvest losses and standardization of processing methodologies.

Likewise, relevant policy and regulatory measures that are related to product quality, as well as plant sanitation will be developed. This is to set the minimum operating quality standards that must be followed in all fisheries post harvest establishments in the Philippines.

#### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
a. Reduction of post harvest losses in the four sub-sectors of the industry																				
- Comprehensive assessment of practices and estimated volume of losses																				
- Institution of relevant policy and regulatory measures to control some fishing practices																				
- Appraisal of the needs for ice plant, freezing and ice/cold storage facilities and provision of institutional facilities/support system																				
- IEC campaign on proper handling																				
- Assessment of post production storage/distribution systems																				

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
b. Standardization of fish processing methodologies to reduce post harvest losses and to come up with high quality and consistent products																				
- Cataloging of all fishery products and processing methodologies and intervention measures																				
- Institution of relevant policy and regulatory measures on product quality and plant sanitation that will set minimum operating quality standards for FPE																				

### Organization and Management:

Activities	Implementing Agency	Collaborating Agencies
a. Reduction of post harvest losses in the 4 sub-sectors of the industry		
- Comprehensive assessment of practices and estimated volume of losses	BFAR, PFDA	BFAR-RO, Private Sector
- Institution of relevant policy and regulatory measures to control some fishing practices	BFAR, PFDA	PFDA, BFAR-RO, UPV-CFOS, Private Sector
- Appraisal of the needs for ice making/ plant, freezing and ice/cold storage facilities and provision of institutional facilities/support system	BFAR, PFDA	FDC, UPV-CFOS, UPD-CHE, Private Sector, LGU
- IEC campaign on proper handling	BFAR, NFRDI, PFDA	BFAR-RO, UPV-CFOS, Private Sector, NGO
- Assessment of post production storage/distribution systems	BFAR, PFDA	BFAR-RO, PFDA, UPV-CFOS, Private Sector
b. Standardization of fish processing methodologies to reduce post harvest losses and to come up with high quality and consistent products		
- Cataloging of all fishery products and processing methodologies and intervention measures	BFAR, NFRDI, PFDA	BFAR-RO, UPV-CFOS, Private Sector, other SUC
- Institution of policy and regulatory measures on product quality and plant sanitation that will set minimum operating quality standards for FPE	BFAR, PFDA	PFDA, BFAD, Private Sector

**Performance Tracking:**

Activities	Expected Output	What to Monitor	When to Monitor	Who to Monitor
a. Reduction of post harvest losses in the four sub-sectors of the industry	Enhanced performance efficiency in the fishery industry	Monitoring of: -losses -increased local sales and volume	At the start of each activity	BFAR, PFDA, Private Sector
b. Standardization of fish processing methodologies to reduce post harvest losses and to come up with high quality and consistent products	Standardized processing methodologies Institution of minimum quality standards for fish and fishery products	Monitoring of: -process and product consistency -level of quality of different fish and fishery products	At the start and end of each activity	BFAR, BFAD

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	1,260,000
Maintenance and Other Operating Expenses	1,740,000
Capital Outlay	50,000,000
<b>TOTAL</b>	<b>53,000,000</b>

**Funding Source:**

Activities	Target Funding Agencies
a. Reduction of post harvest losses in the four sub-sectors of the industry	
- Comprehensive assessment of practices and estimated volume of losses	FAO, UNDP, JICA
- Institution of relevant policy and regulatory measures to control some fishing practices	FAO, UNDP, JICA
- Assessment of post harvest practices in the four sub-sectors	FAO, UNDP, JICA
- Appraisal of the needs for ice making/ plant, freezing and ice/cold storage facilities and provision of institutional facilities/support system	FAO, UNDP, JICA
- IEC campaign on proper handling	FAO, UNDP, JICA

Activities	Target Funding Agencies
- Assessment of post production storage/distribution systems	FAO, UNDP, JICA
b. Standardization of fish processing methodologies to reduce post harvest losses and to come up with high quality and consistent products	
- Cataloging of all fishery products and processing methodologies and intervention measures	FAO, UNDP, JICA
- Institution of relevant policy and regulatory measures on product quality and plant sanitation that will set minimum operating quality standards for FPE	FAO, UNDP, JICA

**Risks/Assumptions:**

1. More technological breakthroughs in post-harvest technologies will be developed

**Project No. 7**

**Title:** “Model Villages for Philippine Fisheries Post-Harvest”

**Site /coverage:** entire Philippines; to initially identify a pilot site

**Rationale/Background:**

One of the main objectives of the Philippine fisheries post harvest sub-sector is the provision of supplementary livelihood to fishing communities through the use of appropriate fish post harvest technology. However, understanding the needs and plight of these communities is an important prerequisite in planning and implementing meaningful and sustainable interventions. Hence, the project entitled “Model Villages for Philippine Fisheries Post Harvest” is designed as an action research project. It is envisioned to study the social and economic well-being of fishing communities and to come up with an appropriate community-based fish post-harvest technology for these communities. This participatory appraisal technique will serve as a springboard for the development of a holistic framework for community-based fisheries resource management that would involve the area of fisheries post harvest.

In the short term, the project is an attempt to increase the income of municipal fishers through the development and transfer of appropriate community-based fish post harvest technology. It is also meant to enhance the social awareness of the members of the fishing communities on the importance of coastal resource management (CRM). In the long term, the project is aimed at improving the economic status of municipal fishers while reducing pressure on fisheries and improving the management of their fishing resource.

**Goal/Objectives:**

The main objective of the project is to develop model villages for fisheries post harvest through combined research and community-based fisheries management. Specifically, the program aims:

- 1) To provide alternative employment and income generating activities to fishing communities through development and dissemination of appropriate and sustainable fish post harvest technology at the village level.
- 2) To enhance social awareness of fishing communities on the importance of community-based coastal resource management through consultations and other fora.
- 3) To develop strategies that will recognize the specific needs and contributions of rural women in fishing communities.
- 4) To sensitize the different disciplines, donor agencies and government and non-government institutions on the need to incorporate fish processing-based community projects to their CRM strategies.

**Key Activities:**

The program will involve two phases. Phase 1 will include studies that are related, but not limited, to the following.

- 1) Initial identification of sites that can potentially serve as model villages.
- 2) Cataloging of fisheries post harvest related problems in fishing communities through diagnostic consultation and the so-called participatory model of community development.
- 3) Identification of a pilot site that will be developed as a model village.
- 4) Determination of appropriate fisheries post harvest methodologies for the identified fishing community.
- 5) Determination of the role of rural women in the identified fishing community and development of strategies to recognize the specific needs and contributions of women in that community.
- 6) Assessment of the level of support from the LGUs and NGOs.
- 7) Evaluation of the socio-economic impacts of the creation of a fisheries post harvest village in the identified fishing community.
- 8) Determination of appropriate strategies for the creation of a model fisheries post harvest village in the identified fishing community.
- 9) Development and dissemination of appropriate fish post harvest technology to the model village.
- 10) Establishment of appropriate fisheries post harvest facilities and equipment.
- 11) Development of marketing strategies for fish products from the model village.
- 12) Organization of a self-regulating center for long run diffusion of fish post harvest technology in the model village.
- 13) Development of an organized evaluation system aimed at determining whether the objectives of the program have been achieved from the perspective of both the project implementers and the target fishing community.

In Phase 2, the viability and validity of the “Model Village for Fisheries Post Harvest”, from Phase 1, in the context of other fishing villages of the same sort will be evaluated. If found to be a positive “show-window”, it will be used as a model for replication to other fishing communities in the country. Other collaborating agencies will also be sought, at this point, to enable the development of an integrated system for a community-based fisheries management scheme. In addition, comprehensive information dissemination will be conducted in an attempt to sensitize the different disciplines, donor agencies and government and non-government institutions on the need for fisheries post harvest to become part of their CRM.

#### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
a. Phase 1. Development of appropriate fish post harvest technology in the model village																				
b. Phase 2. Replication of the model village in other fishing communities																				

#### Organization and Management:

Activities	Implementing Agency	Collaborating Agencies
a. Phase 1. Development of appropriate fish post harvest technology in the model village.	BFAR	NGO, UPV-CFOS, BFAR-RO, SUCs, Private Sector
b. Phase 2. Replication of the model village in other fishing communities	BFAR	NGO, UPV-CFOS, BFAR-RO, SUCs, Private Sector

#### Performance Tracking:

Activities	Expected Output	What to Monitor	When to Monitor	Who to Monitor
a. Phase 1. Development of appropriate fish post harvest technology in the model village.	Development of a Model Village for FPH in the Philippines	Monitoring of: -activities such as site selection, community intervention, selection of appropriate community-based technologies, and others -involvement of women in the project, the NGOs, and other social organizations	At the start and end of each activity	BFAR

Activities	Expected Output	What to Monitor	When to Monitor	Who to Monitor
b. Phase 2. Replication of the model village in other fishing communities	Replication of the model village in at least five other areas in the Philippines	Monitoring of: -replication of the model village in appropriate fishing communities, with not political intervention	At the start and end of each activity	BFAR

**Budget Requirement:**

Item	Amount (in PhP)
Personal Services	4,000,000
Maintenance and Other Operating Expenses	6,000,000
Capital Outlay	2,000,000
<b>TOTAL</b>	<b>12,000,000</b>

**Funding Source:**

Activities	Target Funding Agencies
a. Phase 1. Development of appropriate fish post harvest technology in the model village.	FAO, World Fish Center
b. Phase 2. Replication of the model village in other fishing communities	FAO, World Fish Center

**Risks/Assumptions:**

1. Community members in target sites will actively participate
2. Establishment of model villages will not result in environmental degradation

## 4.6 Institutional Sub-Sector

### **Problem/Issue context:**

The Philippines does not have yet the full-functioning systems and the structures to sustainably manage its fishery resources. Although it is acknowledged that over the years, significant efforts and resources have been put into improving the system. Such inadequacies in fisheries management systems and structures are therefore a result of: (1) limited capabilities of the organizations and institutions within the fisheries sector; (2) weak institutional partnerships within the sector; (3) inadequate/inconsistent fisheries policies; and (4) inadequate human resources.

The lack of financial resources to carry out needed capacity improvements and programs is true for BFAR and other government agencies. Human resources are often stretched thinly in an effort to achieve agency missions and deliver expected services. Moreover, fisheries-related agencies are also constrained by inadequate technologies and limited infrastructure, thereby hampering planning and decision-making.

Partnerships between and among institutions in fisheries remain. Government agencies need to work more closely together in the areas of research, law enforcement, extension services, information systems, and market development. Although the Fisheries Code contributed significantly to building a more solid policy framework for fisheries, much work in policy still needs to be done. Among the key policy issues (conflicts, inconsistencies and gaps) include the following: expansion of municipal waters, confusion between the LGUs and the DENR on the regulation of foreshore/shore lands, and no clear national framework for RD&E in fisheries. The six projects described below are therefore geared towards institutional strengthening, capability building and expanding partnerships.

### **Project No. 1**

**Title:** Improving the Policy and Regulatory Framework for Fisheries

**Site/Coverage:** National

### **Rationale/Background:**

The Medium-term Philippine Development Plan (MTPDP) for 2004-2010 recognizes the critical need for governance reforms. Such areas include the: (1) the clarification of roles and responsibilities of LGUs, DENR and DA in delivering agriculture and fisheries services, (2) addressing institutional overlaps between the DENR, DA and other government agencies, and (3) harmonizing the disparate component agencies and networks of the RDE system (DA, DENR and DOST) with the goal of eventual consolidation and unification.

Although not discussed in the MTPDP, many stakeholders of the fisheries sector continue to believe that there is increasing urgency in the need for a Department of Fisheries, which is separate and distinct from the Department of Agriculture. It is believed that such a department could also handle more effectively international policy issues in fisheries including access to fishing grounds outside our EEZ and trade-related issues. Policy frameworks also have to be reviewed in order to establish enabling environments towards: (1) greater public and private sector collaboration and partnerships, (2) industry self-regulation, and (3) more timely technology transfer.

### Goal/Objectives:

The goal is to move swiftly toward establishing a policy and regulatory environment that supports the effective and efficient management of the fisheries sector. The objectives are:

- 1) To conduct a careful assessment of the existing policies and regulations that has an impact on the system level capacity of the fisheries sector and to identify gaps, inconsistencies and overlaps.
- 2) To conduct a multi-stakeholder workshop to obtain feedback on the identified policy problems, to identify potential directions to solve these problems and to develop an action plan to address the policy issues.
- 3) To undertake the research necessary to make recommendations for necessary policy reforms.
- 4) To conduct information and education campaigns on critical policy issues.
- 5) To push for necessary policy reforms.

### Key Activities:

There are four key activities. One is to conduct multi-stakeholder focused group discussions (five sessions) to develop a widely accepted policy agenda for fisheries. This will be guided by the action plan developed by the partnership initiative in policy reform (see Project 3). The remaining three activities will depend on this. Its output is a policy agenda for fisheries. Two is to commission policy research studies on high priority issues (two per year). Key results would be policy studies. Three is the production of education materials related to fisheries policy. These may take the form of papers, primers and brochures. Four is to undertake policy workshops (four per year). Such will result in recommendations for further advocacy and policy reform.

### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct focused group discussions																				
Commission policy research studies																				
Produce and disseminate education materials																				
Undertake policy workshops																				

**Organization and Management:**

This program will be managed by the partnership initiative on policy. The institutional members of the partnership will handle the policy research studies. Appropriate linkages will be made with the partnership initiative on IEC for the development of education materials and conducting the policy workshops. Institutions with expertise in policy and IEC may be tapped in this project.

**Performance Tracking:**

Monitoring and evaluation will be conducted following the action plan of the policy partnership initiative.

**Budget Requirement:**

	2006	2007	2008	2009	2010
Focus group discussions	1,000,000				
Policy research studies		4,000,000	4,000,000	4,000,000	4,000,000
Education Materials		1,000,000	1,000,000	1,000,000	1,000,000
Policy Workshops		1,200,000	1,200,000	1,200,000	1,200,000
<b>Grand Total</b>	<b>1,000,000</b>	<b>6,200,000</b>	<b>6,200,000</b>	<b>6,200,000</b>	<b>6,200,000</b>

The total cost over five-year period is PhP 25,800,000.

**Funding Source:**

Funds can be sourced from either national government or donor agency grants. Some of the national agencies could also provide funding from their operating budgets.

**Risks:**

1. Strong leadership and strong political will is required for policy reforms to move forward.
2. Some institutions may not want to deal with changes that will result from policy reform.

**Project No. 2****Title: Building the Institutional Capacity of BFAR****Site/Coverage:** National, Entire Bureau**Rationale/Background:**

BFAR, as the line bureau in charge of the fisheries, has quite a number of responsibilities as listed in the Fisheries Code of 1998. Among others, these responsibilities cover the areas of policy and enforcement, industry support and development, regulation of commercial fisheries, research and monitoring. In order to carry out these responsibilities, the Bureau maintains 10 divisions, 13 regional offices and 8 technology centers. Its work also requires the bureau to coordinate with various government agencies, LGUs and the private sector.

The bureau, because of the broad scope of its responsibilities, the number of institutions it has to deal with, its complex organizational structure and the increasing rate of change in its environment, has to ensure that it has the capacity to carry out its mission and mandate into the future. Among the problems that BFAR has to deal with are: (1) inconsistent policies, (2) overlapping responsibilities, (3) lack of financial resources, (4) limited human resources, (5) inadequate technology, and (6) low priority given to fisheries issues.

To improve the agency's ability to carry out its mission more effectively, BFAR will have to undergo a systematic capacity building process. Capacity building will include examining the functions of the agency, re-structuring/re-engineering the agency, designing, establishing and implementing the systems to improve the efficiency of the agency, as well as training and re-training the staff of the agency as needed.

**Goal/Objectives:**

The goal is to identify, define and implement the set of programs and activities that will support the strengthening of BFAR and match its institutional capacity with the challenges of leading the sustainable management of Philippine fisheries. The objectives are:

- 1) To conduct a capacity assessment at the fisheries systems level.
- 2) To assess the present capacity of the bureau through consultation with internal and external stakeholders.
- 3) To undertake a participative and consultative process of articulating the bureau's vision and competency model.
- 4) To define the direction and focus of the BFAR capacity building process toward attainment of the bureau's competency model.
- 5) To use this process of visioning as an opportunity to build team spirit and unity among the senior managers of the bureau.
- 6) To identify and define the reforms, programs, partnerships, systems and resources required by the bureau.
- 7) To formulate a capacity-building plan for the bureau and its employees, to integrate this plan with other plans in which the bureau is involved, and to put in place the

mechanisms necessary to implement the plan, as well as to monitor and evaluate its implementation on a continuing basis.

- 8) To provide training to senior managers in goal-setting and teamwork as part of the process of formulating the plan,
- 9) To implement the capacity building plan of the bureau.

### Key Activities:

There are six key activities. One is to establish the Project Management Unit. Two is to undertake BFAR's capacity assessment. Focus group discussions, surveys and sensing interviews with bureau staff and other stakeholders will be done. The key output will be a report on current state of the fisheries management system in the context of the bureau. Two is to build the BFAR Competency Model. It will define the desired state of BFAR by bringing together a cross-functional mix of leaders from within the institution, as well as validate this competency model across the organization and with representatives of the bureau's stakeholders. Key results are the list of operational processes and behavioral indicators, competency model/ BFAR Framework of Excellence, and re-articulated vision. The third activity is to develop the action and implementation plan. This will entail comparing the current with the desired state and identify competency gaps. An action plan shall be developed by listing and prioritizing the interventions (including milestones and schedules) needed to achieve the desired state of BFAR. Key outputs would include the revised organizational structure, gaps and priorities and action agenda. The implementation of the capacity building plan shall follow. Then, there will be annual review of progress (rolling 3-year plan). Overall, these activities shall contribute to build the capacity of BFAR.

### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Establish project management unit	■																			
Conduct BFAR capacity assessment	■																			
Build the BFAR competency model		■																		
Develop the action and implementation plan			■																	
Implement capacity building plan			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Undertake annual review of progress							■				■				■				■	

**Organization and Management:**

Consultants shall facilitate the process and conduct the training courses. The BFAR Director and Senior Management shall champion the process of capability building. The Project Coordinator (from within BFAR) and Secretariat (project management unit) will be selected to manage the project. BFAR managers and staff are to be co-opted for the various focus group exercises needed by the process. There will be external institutions (government and private sector) to participate in or be consulted in the process (organizational assessment, needs analysis, plan verification, etc.).

**Performance Tracking:**

The capacity building action plan should be integrated into the bureau's overall planning process. It shall be in a form that allows implementation to be regularly reviewed and evaluated, and for the plan to be adjusted annually based on the results of the review process. The project management unit will submit annual reports (to include progress reports, anticipated problems, reasons why plans were not adhered to) to senior management with revised action plans for the following year, preferably on a rolling three-year basis.

**Budget Requirement:**

	2006	2007	2008	2009	2010
PMU Startup	500,000				
PMU Operating Costs	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Capacity Bldg Plan	5,400,000				
Annual Capacity Bldg Activities*	4,000,000	20,000,000	20,000,000	20,000,000	20,000,000
<b>Total Budget</b>	<b>11,900,000</b>	<b>22,000,000</b>	<b>22,000,000</b>	<b>22,000,000</b>	<b>22,000,000</b>

\* Estimate only. Eventual cost to be determined by activities agreed upon for the capacity building plan.

The total budget is PhP 99,900,000 over a five-year period.

**Funding Source:**

Start-up funds can be sourced from a technical assistance grant. Financial requirements for annual plans have to be sourced internally, mainly from the bureau's annual budget. Other grants that these initiatives could qualify for shall be applied.

**Risks:**

1. Loss of political will in the midst of the process.
2. Staff may not participate actively and openly.
3. Inability to sustain commitment to change.

**Project No. 3**

**Title:** Fisheries Management Capacity Through Partnerships

**Site/Coverage:** National, all institutions involved in fisheries management.

**Rationale/Background:**

There are numerous institutions involved in the management of the fisheries sector. Aside from a variety of government institutions, these institutions also include quite local communities, civil society groups and business organizations. Although most institutions claim that lack of financial resources prevents them from effectively performing their roles in fisheries management, many institutions, including government agencies, have overlapping functions and responsibilities. These overlapping functions have resulted not only in the inefficient use scarce resources available, but also in poor institutional accountability due to the redundancies in functions.

In recent years, there has been an increasing emphasis on partnerships not only within sectors but also across sectors. Partnering benefits can be categorized into three: (1) greater efficiency, (2) improved effectiveness, and (3) increased equity. These benefits translate into various outputs for each participant in the partnership. For example, government agencies may experience less bureaucracy and lower costs; private companies may experience increased shareholder and societal value, enhanced reputations and greater competitiveness; civil society organizations may experience greater access to resources, human development and empowerment. Unfortunately, stakeholder consultations undertaken as part of the preparations for the industry plan have consistently identified poor partnering skills as a common organizational shortcoming within the fisheries sector.

**Goal/Objectives:**

The goal is to establish effective partnerships for the management of the Philippine fisheries. The distinct objectives are:

- 1) To conduct assessments of the readiness of potential institutions to enter into formal partnership arrangements.
- 2) To build, among all institutions involved, organizational skills in effective partnering.
- 3) To establish formal partnership initiatives in these 11 critical areas: (1) information systems, (2) policy, (3) empowering local communities, (4) research, development and extension, (5) integrated ecosystem co-management, (6) product and market development, (7) building business sector capacity, (8) information and education campaign, (9) law enforcement, (10) financing and investments, and (11) education.
- 4) To establish the management organization for each of these partnership initiatives.
- 5) To build a common/shared plan and M&E systems for each of the identified partnership initiatives with clear roles, responsibilities and accountability for all institutions involved.

**Key Activities:**

Five activities shall be undertaken. One is to identify and eventually secure the involvement of partners in the 11 partnership (or management) areas. A list of institutional partners for each management area shall come out. Two is to undertake partnering workshops (to include visioning, teambuilding, etc.). Among others, this will result in partnership vision, MOUs/MOAs and appointment of partnership coordinators.

Three is the conduct of planning workshops (to include training in leadership, program/project development and management). The main outputs are management plans that contain programs and projects, structure/distribution of responsibilities, resource budgets and financing plans and grant proposals. Fourth, such plans will be submitted. Then, plan implementation will follow. As part of M&E, periodic reports by each partnership coordinator will be produced. The partnerships may be institutionalized and sustained through periodic plan updates, best practices database and training courses.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Identify and secure partners																				
Undertake partnering workshop																				
Conduct planning workshop																				
Submit relevant plan																				
Implement the plan																				

**Note: the same sets of activities shall be undertaken for the 11 partnership groups**

**Organization and Management:**

The Secretariat of the Fisheries Development Coalition (FDC) will manage the establishment of the 11 partnership initiatives. They will identify all institutions to be involved in each of the initiatives, invite these potential partners to the workshops, schedule the partnering workshops, oversee the finalization of roles and responsibilities, and coordinate the commitments made by the partner institutions as well as the finalization of MOUs/MOAs. Institutions involved in each partnership initiatives will elect from among themselves the lead agency/institution for the partnership. The chief executive of the lead agency or institution will serve as the head of the partnership initiative.

**Performance Tracking:**

Once partnerships are established, each partnership will develop a plan of action for the partnership initiative. The partnership will also prepare an implementation plan, as well as a communication and M&E plan.

**Budget Requirement:**

<b>Partnership</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<i>Information Systems</i>	2,108,000	600,000	600,000	600,000	600,000
Policy	2,108,000	600,000	600,000	600,000	600,000
Empower Local Communities	2,108,000	600,000	600,000	600,000	600,000
RD&E	2,108,000	600,000	600,000	600,000	600,000
Integrated Ecosystem Co-Mgt	1,958,000	600,000	600,000	600,000	600,000
Product and Market Dev	1,958,000	600,000	600,000	600,000	600,000
Business Sector	1,808,000	600,000	600,000	600,000	600,000
IEC	1,808,000	600,000	600,000	600,000	600,000
Law Enforcement	1,808,000	600,000	600,000	600,000	600,000
Financing and Investments	1,808,000	600,000	600,000	600,000	600,000
Education	735,000	1,673,000	600,000	600,000	600,000
<b>GRAND TOTAL</b>	<b>20,315,000</b>	<b>7,673,000</b>	<b>6,600,000</b>	<b>6,600,000</b>	<b>6,600,000</b>

*Note: The above budgets do not include personnel costs for each of the partnership initiatives, equipment purchases they may need and projects to be undertaken by the partnerships.*

Budget Requirement	<i>START-UP</i>	<i>Annual</i>
Partnership:		
Partnering Workshop (@ 20-30 participants)	735,000.00	
Planning Workshop (@ 20-30 participants)	1,073,000.00	
Supplies and Services		360,000.00
Meeting and Training Expenses		240,000.00
<b><i>SUB-TOTAL PER PARTNERSHIP</i></b>	<b>1,808,000.00</b>	<b>600,000.00</b>

The total budget for the five year period is PhP 47,758,000.

**Funding Source:**

Start-up expenses could be covered by capacity-building grants from donor agencies. The cost for the key activities shall be sourced from DA-BFAR and partner agencies.

**Risks:**

1. Inability to establish strong and committed leadership for each of the partnerships.
2. Inability to raise/allocate funds for partnership activities.

**Project No. 4****Title: Networks of Local Fisherfolk and Aquaculture Communities****Site/Coverage:** National**Rationale/Background:**

There is increasing recognition around the world that new approaches for the sustainable management of fisheries resources are necessary. Traditional management approaches that focused only on government agencies (national agencies and LGUs) have not been successful. Co-management - or the arrangement where management responsibilities over fisheries resources are shared between the government and the local fishing communities - has been recognized as a promising option for reform of fisheries governance institutions. Involving local communities in the co-management of fisheries resources will not be successful, however, without ensuring that the communities have the capacity to participate significantly and meaningfully in the co-management efforts. Networks can be an effective mechanism for empowerment and building the capacity of local communities through the sharing of information and the delivery of support programs. Networks can also be the channel for the distribution of assistance to local communities.

**Goal/Objectives:**

The goal is to build networks of local communities to serve as channels for the sharing of information and for the delivery of support. The specific objectives are:

- 1) To encourage the establishment of community-based networks for fisherfolk and aquaculture farmers;
- 2) To provide the coordination infrastructure for these networks;
- 3) To focus network activities initially on information exchange and advocacy;
- 4) To deliver to local communities other forms of support or assistance
- 5) To encourages linkages between these networks and government, academic, research and private institutions.

**Key Activities:**

There are four key activities. First is to establish the community networks. Each distinct network shall be established for fisherfolks and aquaculturists. Second is to train the staff involved in the network. Third is to undertake network coordination tasks. This includes information exchange and other activities initiated by network members. Fourth is to target financial support program for local communities through the preparation of relevant proposals. Eventually the networks to be formed from the above activities will be able to provide other opportunities for local communities to meaningfully participate in the co-management of fisheries resources. Such networks may also facilitate securing funding for

strategic capacity building activities, such as training courses, community projects and planning workshops.

#### Schedule of Activities:

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Establish the networks																				
Train the Staff																				
Undertake network coordination																				
Target support grants																				

#### Organization and Management:

A Network Coordinator and Secretariat shall be established for each of the two networks. Local communities will be encouraged to organize and manage themselves. Guidelines for targeted support grants to be determined by empowering local communities partnership initiative. Networks will be managed within the Empowering Local Communities Partnership Initiative

#### Performance Tracking:

Performance shall be measured through the annual network plan. The quarterly reports of network coordinators will be also used. Local communities will apply for and report on use of financial support, following pre-established program guidelines.

#### Budget Requirement:

	2006	2007	2008	2009	2010
<b>Fishing Community Network</b>					
Start Up	500,000	0	0	0	0
Operations	490,000	1,960,000	1,960,000	1,960,000	1,960,000
<b>Aquaculture Community Network</b>					
Start Up	500,000	0	0	0	0
Operations	490,000	1,960,000	1,960,000	1,960,000	1,960,000
<b>Training of Network Staff</b>	1,050,000	0	0	0	0
<b>Targeted Support Grants</b>		20,000,000	20,000,000	20,000,000	20,000,000
<b>GRAND TOTAL</b>	<b>3,030,000</b>	<b>23,920,000</b>	<b>23,920,000</b>	<b>23,920,000</b>	<b>23,920,000</b>

Note: This budget does not include expenses to be incurred by the local communities in building their capacities. The targeted support grants will, however, serve as an incentive for local communities to make investments in the right direction.

Budget Requirement	<i>STARTUP</i>	<i>Annual</i>
Fisheries Communities Network:		
Coordinator		600,000.00
Network Support Staff (2)		480,000.00
Office Furniture and Equipment	500,000.00	100,000.00
Supplies and Services		360,000.00
Travel		420,000.00
Sub-Total	<u>500,000.00</u>	<u>1,960,000.00</u>
Aquaculture Network Coordinator:		
Coordinator		600,000.00
Network Support Staff (2)		480,000.00
Office Furniture and Equipment	500,000.00	100,000.00
Supplies and Services		360,000.00
Travel		420,000.00
Sub-Total	<u>500,000.00</u>	<u>1,960,000.00</u>
Training of Network Coordinators and Staff:		
Stakeholder Analysis and Visioning	350,000.00	
Planning	350,000.00	
Participative Processes	350,000.00	
Sub-Total	<u>1,050,000.00</u>	
Targeted Support (Annual Grants to Local Communities)		<u>20,000,000.00</u>

The total budget over the five year period is PhP 98,710,000.

#### **Funding Source:**

The budget may come from the national government. An agency or institution that will head the empowering local communities partnership initiative will provide office facilities. External grant shall be sourced out, as appropriate.

#### **Risks:**

1. Poor network leadership and coordination.
2. Interest of local communities may wane due to poor communication/ lack of activities.
3. Inability to identify local community leaders.
4. Financial mismanagement of grants.

**Project No. 5****Title: Alliances for the Integrated Co-Management of Fisheries Ecosystems****Site/Coverage:**

National, covering the following ecosystems, marine and freshwater: Lingayen Gulf; Manila Bay; Tayabas Bay; Lamon Bay; Ragay Gulf; Lagonoy Gulf; Ticao Pass, Samar Sea; Carigara Bay; Leyte Gulf; Cebu Strait; Tanon Strait; Guimaras Strait; Taytay Bay; Malampaya Sound; Sulu Archipelago; Illana Bay; Davao Gulf; Laguna de Bay; Taal Lake; Pampanga River Basin (including Candaba); Cagayan River Basin; Lake Buhi; among others

**Rationale/Background:**

The traditional concept of managing fisheries resources was through measures to regulate access to the fisheries. These management responsibilities were often assumed by the national and local government agencies. Unfortunately, there are few examples of truly successful government-led fisheries management efforts around the world. Government institutions tasked with regulating access to fisheries are unable to effectively address resource management issues that increasingly include the use of these resources for economic activities other than fishing. In past years, the participation of local communities in the management of resources or “co-management” has shown promise. Nevertheless, success has so far been limited. It is believed that the participation of local communities not only in the implementation process but also in establishing the management objectives and in supplying the knowledge to be considered in decision making will allow such co-management efforts to be more successful. Such local community participation is called “integrated co-management.”

Another reason cited for limited success of fisheries management efforts by local governments in the Philippines is the observation that using “municipal waters” as the basic unit for resource management is impractical. This is because most nearshore fishery resources are actually shared across by two or more municipalities. Since such resources cannot be managed independently of the actions or efforts by other management institutions sharing the resource, an “ecosystem approach” is often necessary. The ecosystem approach goes beyond administrative boundaries and stresses collaborative arrangements and partnerships across management institutions.

The integrated co-management of fisheries ecosystems through effective alliances therefore requires the participation of the following institutions: (1) LGUs (villages, municipalities and provinces) with jurisdiction over the ecosystem or whose residents are users of the ecosystem; (2) local communities dependent on the ecosystem; (3) civil society organizations; (4) BFAR; and (5) other government agencies.

**Goal/Objectives:**

The goal build truly effective and formal alliances among local communities, LGUs, BFAR and other government agencies for the integrated co-management of specific ecosystems. Specifically, the project aims to:

- 1) To conduct assessments of the readiness of potential partners in particular ecosystems to enter into formal partnership arrangements.
- 2) To build, among all institutions involved, organizational skills in effective partnering.
- 3) To identify opportunities to build technical capabilities of the institutions.
- 4) To build a common/shared plan and M&E systems for the integrated co-management of particular ecosystems with clear roles and responsibilities for all institutions involved.

**Key Activities:**

There are five activities to be done. One is to identify and eventually secure the involvement of allies in the 25 priority ecosystems. A unit within BFAR shall be identified to oversee this activity. A list of allies for each ecosystem shall be developed. Two is to undertake partnering workshops. This will lead to building the alliances required for the management of each ecosystem. Among others, this will result in partnership vision, MOUs/MOAs, including the expected contributions of the parties involved.

Three is the conduct of planning workshops (to include training in leadership, program/project development and management). The main outputs are management plans that contain programs and projects, structure/distribution of responsibilities, resource budgets and financing plans and grant proposals. Fourth, such plans will be submitted and duly endorsed. Then, plan implementation will follow. The alliances may be institutionalized and sustained through periodic reports by ecosystem, best practices database and training courses.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Identify and secure partners																				
Partnering Workshop																				
Planning Workshop																				
Submission of Plan																				
Implementation of Plan																				

*Note: the same sets of activities shall be undertaken for the 25 identified ecosystems*

**Organization and Management:**

The integrated ecosystem co-management partnership initiative is anticipated to oversee and coordinate these. The BFAR Regional Offices and Technology Centers shall serve, as may be required, as members of the specific ecosystem alliances. NGAs, LGUs and CSOs may also participate as members. Specific roles, responsibilities and contributions at the ecosystem level, including the appointment of the ecosystem manager, will be negotiated and agreed upon by each alliance.

**Performance Tracking:**

The alliance members, depending on their specific roles and responsibilities, will be required to submit periodic progress reports. **Ecosystem managers will also be required to submit periodic progress reports. The BFAR Coordinator may monitor the progress of each alliance.** Institutions can be tapped, as a learning/capacity building exercise, to perform evaluations of alliance progress in ecosystems other than their own.

**Budget Requirement:**

	2006	2007	2008	2009	2010
Coordinating Unit	2,030,000	2,660,000	2,660,000	2,660,000	2,660,000
Ecosystem 1	1,808,000	600,000	600,000	600,000	600,000
Ecosystem 2	1,808,000	600,000	600,000	600,000	600,000
Ecosystem 3	735,000	1,673,000	600,000	600,000	600,000
Ecosystem 4		2,258,000	600,000	600,000	600,000
Ecosystem 5		2,258,000	600,000	600,000	600,000
Ecosystem 6		2,258,000	600,000	600,000	600,000
Ecosystem 7		2,108,000	600,000	600,000	600,000
Ecosystem 8		2,108,000	600,000	600,000	600,000
Ecosystem 9		2,108,000	600,000	600,000	600,000
Ecosystem 10		1,958,000	600,000	600,000	600,000
Ecosystem 11		1,958,000	600,000	600,000	600,000
Ecosystem 12		1,958,000	600,000	600,000	600,000
Ecosystem 13		1,808,000	600,000	600,000	600,000
Ecosystem 14		1,808,000	600,000	600,000	600,000
Ecosystem 15		735,000	1,673,000	600,000	600,000
Ecosystem 16			2,258,000	600,000	600,000
Ecosystem 17			2,258,000	600,000	600,000
Ecosystem 18			2,108,000	600,000	600,000
Ecosystem 19			2,108,000	600,000	600,000
Ecosystem 20			2,108,000	600,000	600,000
Ecosystem 21			2,409,600	600,000	600,000
Ecosystem 22			2,409,600	600,000	600,000
Ecosystem 23			2,409,600	600,000	600,000
Ecosystem 24			2,259,600	600,000	600,000
Ecosystem 25			2,259,600	600,000	600,000
<b>GRAND TOTAL</b>	<b>6,381,000</b>	<b>28,856,000</b>	<b>35,321,000</b>	<b>17,660,000</b>	<b>17,660,000</b>

*Note: The above budget estimates do not include personnel costs for managing the alliances, equipment purchases and projects that the alliances may decide to undertake.*

Budget Requirement	<i>START-UP</i>	<i>Annual</i>
Alliance Coordinating Unit:		
Full time Project Leader		600,000.00
Project Staff (3)		720,000.00
Office Furniture and Equipment	700,000.00	140,000.00
Supplies and Services		480,000.00
Travel		720,000.00
Sub-Total	<u>700,000.00</u>	<u>2,660,000.00</u>
Ecosystem Alliance:		
Partnering Workshop (@ 30-50 participants)	735,000.00	
Planning Workshop (@ 30-50 participants)	1,073,000.00	
Supplies and Services		360,000.00
Meeting and Training Expenses		240,000.00
Sub-Total per Ecosystem	<u>1,808,000.00</u>	<u>600,000.00</u>

The total budget over a five-year period is PhP 105,878,000. This budget shall include all sites indicated by the municipal fisheries group as well as some freshwater ecosystems that are important for aquaculture. For the sake of estimating budget requirements, we used a total of 25 ecosystems.)

#### **Funding Source:**

The operating expenses for the coordinating unit and ecosystem alliances can be provided out of existing institutional budgets. Start-up expenses, particularly the workshop expenses, can be covered by capacity-building grants from donor agencies.

#### **Risks:**

1. Alliances may not be sustained if resources are not put in place quickly.
2. Strong leadership should be provided.
3. Funding for the work of the alliances should be available.
4. Democratic/participative approach may not be appreciated by government agencies accustomed to top-down approaches.

**Project No. 6****Title:** Upgrading Business Sector Capability**Site/Coverage:** National**Rationale/Background:**

Many studies have shown that the fisheries sector of the Philippines does not possess yet the necessary systems and structures to sustainably manage its fisheries resources. While attention has been focused on the role of government agencies in fisheries management, there is increasing recognition that the development of Philippine fisheries cannot be undertaken efficiently without the active involvement of the private sector. Unfortunately, adequate partnership mechanisms between the government and the private sector have neither been fully established nor have they been effectively nurtured. At the same time, the business sector itself has not established a strong track record in effective partnering among its members.

A key element to the long-term survival and growth of the business sector in fisheries will be the sector's recognition that the business landscape is changing. Hence, the business sector at the level of individual firms, sub-sector groups and the entire sector itself, will need to change at a faster pace. The business environment is expected to change rapidly in the coming years due to globalization, changing preferences of consumers, increasing importance of environmental responsibility and new technology. It will be important for our industries to begin to change their way of thinking and their manner of doing things -- firms will have to change their management practices, the workforce will need to acquire new skills, and new technologies will have to be developed.

There will be a greater need to emphasize collaboration, partnerships and alliances to expand markets than on competition within existing limited markets. There will be a greater need to utilize the scarce resources more effectively. It will be necessary to invest in better technologies, better training of the workforce, and improvements in product quality.

For these reasons, capacity upgrading will have to be undertaken by the business sector with the support, whenever possible, of the government. The various industry associations can lead such capacity upgrading after they have had the opportunity to undertake the capacity building processes on themselves.

**Goal/Objectives:**

The overall goal is to provide business institutions of the fisheries industry with a framework to work collectively with relevant stakeholders and institutions in building the capability to meet the many challenges facing the industry. The discrete objectives are:

- 1) To build effective partnerships among the many industry associations within the fisheries sector.

- 2) To strengthen the capacities of these associations to better represent and serve their member firms.
- 3) To build effective partnerships between these associations and government institutions, particularly in the area of market development and financial support (credit and investments) for the industry.
- 4) To collectively conduct a realistic assessment of the capacities of the business sector of the fisheries industry relative to emerging worldwide trends and challenges.
- 5) To build a shared vision of a highly productive, sustainably managed and globally competitive Philippine fisheries industry and sub-industries.
- 6) To determine the capability/capacity gaps of the industry and develop plans to address these gaps on a continuing basis.
- 7) To obtain and provide financial support (at least for the first three years) for certain strategic activities (self-regulation, product development, joint marketing initiatives, information systems, etc.) undertaken by the private sector to upgrade industry capabilities.

**Key Activities:**

There are eight key activities. One is to undertake partnering workshops for all industry associations. Key outputs would include agreements on strategic needs, roles and responsibilities, as well as partnership structures. Two is the conduct of planning workshops for the partnerships of industry associations. This will result in the development of 3-year action plan for the partnership, implementation plan, communication plan and M&E plan. The first two activities will lead to the implementation of overall industry association plan(s). The fourth task is initiating the partnering workshop between industry and government institutions (BFAR, BOI, government financial institutions). Key outputs would include a review of industry needs and general strategies; also agreement on nature of collaboration and partnerships.

The fifth activity is doing the business sector strengthening partnership initiative. This will involve capability upgrading assessment and planning for each association (bangus, tilapia, seaweeds, shrimp, commercial fishing, processors, exporters and others). Planning workshops per industry association will commence, and then planning workshops per industry association shall follow. Then, there will be implementation of capability upgrading plans at the sub-industry and initiative levels and disbursement of targeted support grants. There will be review and renewal of capability upgrading plans. This will be based on monitoring reports and annual plans.

**Schedule of Activities:**

Activity	2006				2007				2008				2009				2010			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Conduct overall industry associations partnering workshops																				
Undertake overall industry associations planning workshops																				
Implement overall industry association plan																				
Conduct partnering workshop between business and other entities																				
Initiate business sector strengthening partnership initiative (see program 3)																				
Conduct planning workshops per industry association																				
Implement the plans																				
Review and renew of plans																				

**Organization and Management:**

The industry partnering initiative may be led by an organization like the Fisheries and Aquaculture Board of the Philippines (FAB). FAB should include, as one of its major advocacies, the institutional capacity strengthening of industry associations. Workshops will be facilitated by professional trainers. Guidelines for targeted support programs to be developed with wide consultation to ensure active participation and to maximize benefits.

**Performance Tracking:**

All plans developed under this program should be three-year capability upgrading plans which should be reviewed annually and renewed on a rolling 3-year basis.

**Budget Requirement:**

	2006	2007	2008	2009	2010
Overall Industry Partnering Workshop(s)	1,500,000				
Overall Industry Planning Workshop(s)	2,200,000				
Capacity Assessment and Planning Workshops for each association (ten associations)	10,000,000	10,000,000			
Grants for Targeted Support		25,000,000	25,000,000	25,000,000	0
<b>GRAND TOTAL</b>	<b>13,700,000</b>	<b>35,000,000</b>	<b>25,000,000</b>	<b>25,000,000</b>	<b>0</b>

*Note: This budget does not include projects and activities that the industry associations may decide to undertake as part of their action plan. It also does not include investments, such as the training of workers that businesses may make to upgrade their capabilities. Although the targeted support grants may be used for these purposes, the grants are meant to serve as incentives for the business sector to move in the right direction.*

The total funding over five years is PhP 98,700,000.

**Funding Source:**

The initial budget shall be sourced from national government and donor agency grants. Subsequently, all activities should be financed by the business sector.

**Risks:**

1. Government agencies isolating themselves from the business sector.
2. Rivalry amongst groups in the industry.
3. Political pressure and influence.
4. Failure to integrate with other institutional capacity building initiatives.

It is noted that every project contained under each of the five sub-sector falls within a particular theme. As mentioned in Project No.3 under the institutional sub-sector, there are 11 partnerships: (1) information systems, (2) policy, (3) empowering local communities, (4) research, development and extension, (5) integrated ecosystem co-management, (6) product and market development, (7) building business sector capacity, (8) information and education campaign, (9) law enforcement, (10) financing and investments, and (11) education. Each partnership correspond to a theme. Hence, Project No. 4 (Rehabilitation and Regeneration of Coastal Ecosystems) under the municipal capture fisheries sub-sector shall fall within the theme of integrated ecosystem co-management. Similarly, Project No. 2 (Development and Implementation of a Monitoring, Control and Surveillance (MCS) System) under the commercial capture fisheries sub-sector shall be included in the theme on enforcement. Also, Project No. 2 (Enhance RD & E Programs and Prioritize according

to Immediate Needs of the Industry) neatly belongs to the research, development and extension theme.

This chapter provides the action plan for the first Medium-Term. As such, it describes the proposed project interventions over the first five years (2006-2010). Each project has an implementation period of between one to five years. In total, 35 priority projects have been identified for these five sub-sectors: (1) municipal capture fisheries, (2) commercial capture fisheries, (3) aquaculture, (4) post harvest, and (5) institutional. The next chapter describes the medium-term implementation plan.

## **CHAPTER 5**

### *MEDIUM-TERM IMPLEMENTATION PLAN*

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This chapter describes the processes to be undertaken during the five-year implementation phase for 2006-2010. Section 5.1 on institutional arrangements cover the roles/responsibilities of the relevant agencies and stakeholders, including the proposed organizational structure. Although BFAR shall retain the lead role in the implementation of the CNFIDP, a Fisheries Development Coalition (FDC) and a number of a number of partnership initiatives shall be established to assist in implementation. Section 5.2 provides the indicative implementation schedule of the plan's individual projects. Some projects will be implemented on the first year (2006), while others will be implemented throughout the five-year duration. The section on cost and financing (Section 5.3) summarizes the total indicative cost of PhP 1,638.13 million for the 35 projects. The bulk of the budget goes to aquaculture (43%), followed by institutional (29%), while the least is municipal (3%). This budget proportion is due to the greater role of the aquaculture sub-sector to maintain the national food fish security, and the need to strengthen the institutions involved in fisheries management. External financing schemes will be explored given the limited capability of the national government, such as the private sector and international funding institutions. Section 5.4 (monitoring and evaluation plan) includes the mechanism to monitor progress of plan implementation based on indicators and targets, and the protocol for re-assessing the efficiency of the plan. Reporting and feedback mechanisms will be used to build accountability among the stakeholders. As part of adaptive management approach, all plan will be assessed and revised periodically. The implementation of the above 35 priority projects is anticipated to strengthen the foundation towards sustainable development of the Philippine fisheries.

### **5.1 Institutional Arrangements**

This section describes the management mechanism on how the various project elements of the plan will be implemented. There is no hard-and-fast rule concerning the mode of institutional arrangement that will best promote the implementation of the CNFIDP. Hence, the organizational design has been guided by the constraints encountered and the lessons learned in the implementation of the past national fisheries plans over the last 30 years. Such limitations included the following: (1) institutions outside BFAR had no strong sense of ownership over the plans; (2) programs and/or projects outlined in the plans did not sufficiently empower the agencies involved to carry out their responsibilities,; (3) accountabilities for the expected outputs and outcomes of the plans were not clear; and, (4) performance/progress of the sector against the plans was not systematically monitored or measured on a regular basis.

The proposed management mechanism takes into account the peculiarity of the Philippine context, such as the political traditions, conditions of the fishery resources, and technical capabilities of partner agencies. As the line government agency in charge of the fisheries, BFAR's primary responsibility for implementing national fisheries plans is duly accounted. It must be acknowledged, however, that the project interventions of the past and present national fisheries plans have involved and will continue to involve a large number of other government agencies . Unfortunately, for most of these other NGAs and LGUs, fisheries is just one of the

many sectoral concerns that they have to address. For example, the LGUs, on top of governance, have to deal with delivering a number of basic and other services to their constituents. Given the LGUs' limited financial and human resources, as well as the inadequate support provided to them by the NGAs, fisheries concerns are very often addressed only within special projects funded by external grants.

In order to successfully implement the CNFIDP, the following need to be incorporated into the plan's implementation strategies. One is an improvement in the strategic and change management processes within and across the fisheries sector. Two, it is desirable to have a shift in the role and culture of government institutions from "commanding and doing" to "service and leadership" – or setting the right conditions for the fisheries sector to grow, develop and contribute to food security and deliver economic benefits to Filipinos. Three, the roles of other institutions – both public and private – in the management and development of Philippine fisheries must be duly recognized. The fourth item pertains to the continuing rationalization of relationships between the central and the local governments. Improving the relationships between government agencies and the private sector, as well as effective partnering mechanisms within and across sectors, will improve the operations of government bureaucracy. Sixth is the need for more effective participative processes across the system to ensure ownership of the plan. Seventh is to minimize overlapping or duplicating functions, thereby making more efficient use of resources. Eight is the need to strengthen the accountability structures, including the incorporation of performance assessment and management systems, whenever appropriate. Further, there has to be a special support for CNFIDP management and implementation capacity.

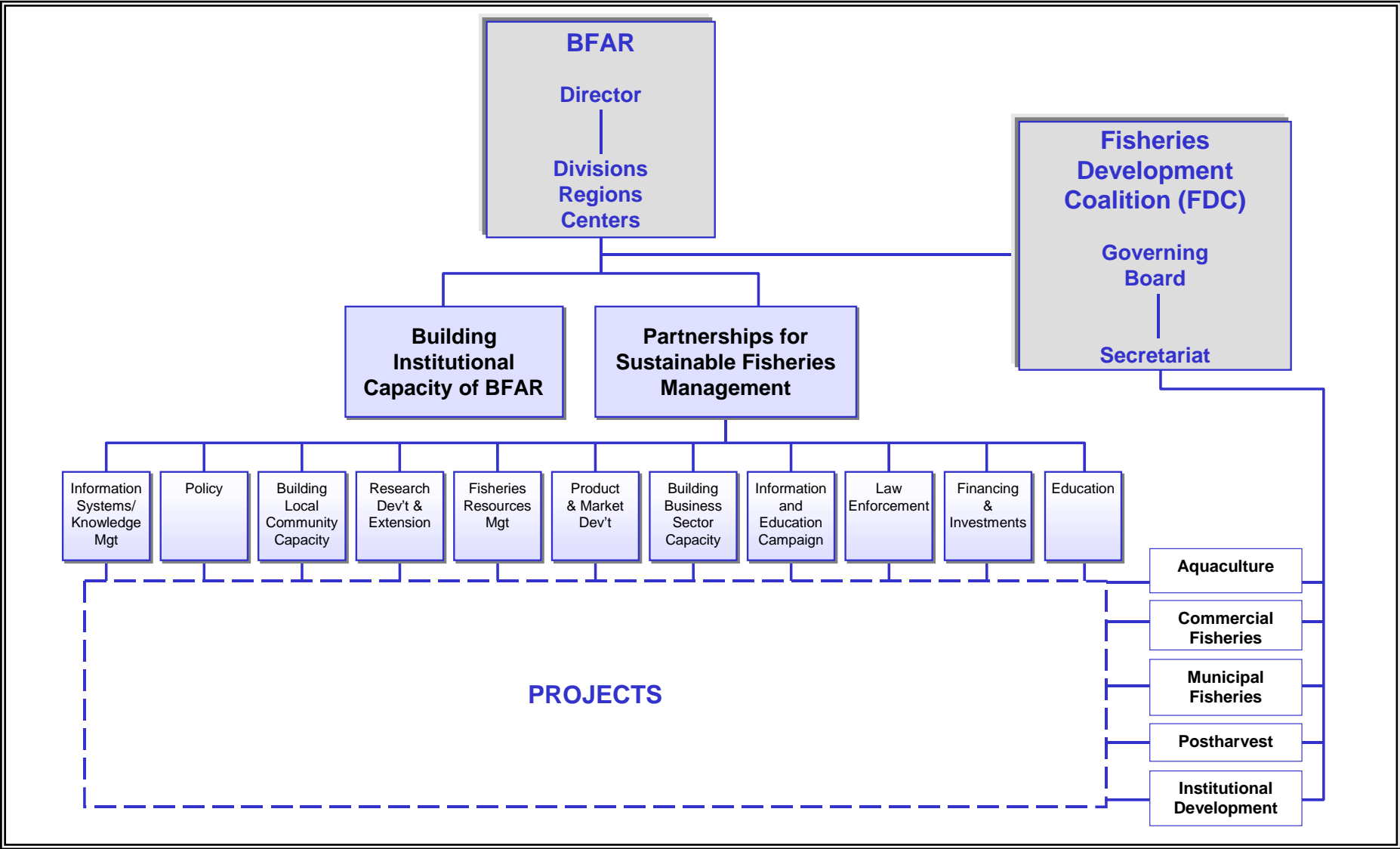
Taking the above factor into consideration, the implementation structure as shown in Figure 5.1.a is being proposed. The implementation structure has been designed following three general principles. First, it is integrated and holistic in context. It is intended to provide the necessary balance: allows access to the highest national authorities, and at the same time respects the existing set-ups and flows of authority at the appropriate levels of governance. Being comprehensive, the structure allows for the inclusion and linkages of various projects. Secondly, it espouses adaptive management. Although the structure encompasses a wide range of initiatives, it allows for implementation on a modular basis – incremental capacity development based on realistic priorities and available resources. The structure will also allow pilot initiatives, as necessary, and the ability to experiment and apply lessons learned. Adaptive management is a cyclic, learning-oriented, and requires an explicitly experimental approach to management. Thirdly, it promotes institutionalized participation and not simply consultation. Among others, the institutional arrangement considers the multi-stakeholder participation, sharing of decision-making and flexibility in operations. The organizational structure's associated M&E scheme – as well as the financing plan – is meant to assure responsiveness to the fast-changing situation of the Philippines fisheries. The participative approach will ensure ownership of the plan's programs across the various stakeholder groups.

BFAR will still be primarily responsible for overseeing the implementation of the CNFIDP. It shall directly carry out the project pertaining to building institutional capacity of BFAR. The implementation of most CNFIDP projects, however, will be carried out through a number of partnership initiatives. Each partnership shall be established to carry out one or more projects.

In order to rally the industry behind the plan and to encourage the entire industry to work together, a Fisheries Development Coalition (FDC) shall be created. Such entity will work

closely will BFAR. It will be established, most probably through an Executive Order, to be issued by the President. The FDC's membership will be open to all organizations, public and private, that are involved in fisheries. A Governing Board, members of which will be elected by the FDC membership at large, will be responsible for governing the FDC. The Governing Board will have its own set of officers headed by a Chairperson. The FDC's mission/vision will reflect the mission/vision of the CNFIDP. Its primary approach to achieving its mission/vision will be by providing assistance to BFAR in the implementation of the CNFIDP. The FDC's secondary function will be to serve as the communication center for the plan.

Figure 5.1.a Proposed structure for the implementation of the CNFIDP.



The FDC will form a functional CNFIDP Secretariat. This will be headed by the CNFIDP Executive Secretary, to address the day-to-day operations involved in plan implementation. The Secretariat's tasks will include, among others, the following:

- 1) Organizing and facilitating the establishment of the partnership initiatives necessary to carry out the CNFIDP;
- 2) Providing oversight and administrative support for the management of the partnership initiatives;
- 3) Collecting and integrating (into one CNFIDP Annual Work Plan) annual plans from the various partnership initiatives;
- 4) Receiving periodic progress reports from the partnerships;
- 5) Monitoring and evaluating the progress being made relative to the CNFIDP;
- 6) Communicating status, continuing problems and achievements to the entire industry through industry bulletins, newsletters and other appropriate means; and
- 7) Mobilizing donor funding and coordinating donor activity for the CNFIDP.

In order to carry out these functions, the CNFIDP Secretariat will need to be adequately staffed and equipped. The Executive Secretary will require the support of administrative and technical staff. Positions within the Secretariat may therefore include, but not limited to:

- 1) One (1) Administrative Officer
- 2) Five (5) Technical Experts (Commercial Fisheries, Municipal Fisheries, Aquaculture, Postharvest and Institutional Development)
- 3) One (1) Donor Liaison Specialist
- 4) One (1) Communications Officer
- 5) Adequate support staff

As shown earlier in Figure 5.1.a, most CNFIDP projects will be implemented through formal partnerships. At the moment, 11 partnership 'clusters' are identified. These are: (1) information systems, (2) policy, (3) empowering local communities, (4) research, development and extension, (5) integrated ecosystem co-management, (6) product and market development, (7) building business sector capacity, (8) information and education campaign, (9) law enforcement, (10) financing and investments, and (11) education. To get each partnership off the ground, all institutions/organizations who are involved in-or willing to become involved in pursuing the objectives of the partnership- will be invited to a partnering workshop. These partnering workshops are the same as those indicated in Project No. 3 of the Institutional Development sub-sector of the CNFIDP. The objectives of each partnering workshop are to: (1) define the scope of work envisioned for the partnership under the CNFIDP, (2) present the list of potential programs and/or projects that can be undertaken under the partnership, (3) present the organizational and management mechanisms for the operation of the partnership, (4) obtain the commitment of the institutions/organizations to participate in and contribute to the partnership in general and its specific programs/projects in particular, (5) obtain institutional commitment of resources to the activities of the partnership, (6) develop agreements on the terms of participation of the various institutions in the partnership, and (7) agree on the roles of the institutions, especially those who will have management responsibilities for the partnership. Eventually, formal memoranda of agreements/understandings (MOAs/MOUs) shall be developed based on the consensus reached during each workshop.

Each partnership will be managed by a Partnership Manager (or Coordinator). The Partnership Manager, with the support of a Partnership Council (this unit may also take the form of a Committee or Board), will be responsible for overseeing the projects of the partnership. The activities of the partnership will be managed by a Project or Activity Manager who will be expected to follow standard project operation procedures (planning, budgeting, evaluating, reporting, etc.). Partnerships are expected to undertake their own strategic management process, followed by medium-term and annual work program planning. The five Technical Experts on the CNFIDP Secretariat will support the Partnership Managers in overseeing project management, particularly on technical matters. They will be involved in reviewing project proposals, evaluating project progress and cross-partnership interactions.

In effect, the implementation arrangement is a form of matrix organization. The set-up is akin to the operation of the Fisheries Industry Development Council (FIDC), which is now defunct. The FIDC was established in late 1970s and operated until mid-1980s, providing a technical/management support to BFAR. Under the proposed set-up, there are lead and support agencies that shall implement each project that fall within a relevant sub-sector. For example, Project No. 1 under Institutional sub-sector on 'Improving the Policy and Regulatory Framework for Fisheries' will be handled by the group on Policy Partnership. Similarly, Project No. 5 titled 'Sustainable Fisheries Livelihoods Support' for the Municipal Fisheries sub-sector will be administered by the group on Financing and Investment Partnership.

## **5.2 Implementation Schedule**

Implementation may be viewed as three sequential, but overlapping, processes: (1) programming, (2) monitoring, and (3) evaluation. Programming lays out exactly what needs to be done on the individual projects. It specifies the order in which activities will be undertaken and who will do them. Programming – which translates the individual project into operational details – is needed before implementation can take place. The 11 elements in each project briefs contained in the CNFIDP are still indicative. As such, each project brief must be transformed/developed into full project proposals. Transforming these projects briefs into discrete/implementable projects shall form part of the operational uptake for the CNFIDP.

This section provides the indicative implementation schedule of the plan's individual projects. This is depicted in Table 5.2.a. Some projects will be implemented on the first year (2006), while others will not be implemented until the next two years. A few projects will be implemented throughout the five-year duration.

Table 5.2.a. Schedule of Project Implementation (2006-2010)

Sub-Sector	Program	Projects	Year				
			1 (2006)	2 (2007)	3 (2008)	4 (2009)	5 (2010)
Municipal Capture Fisheries	Sustainability and Equity in Municipal Fisheries	Project 1 – Comprehensive Education Program for FARMC Fisherfolk Representatives					
		Project 2 – Institutionalization of Preferential through Municipal Fisheries Registration and Licensing					
		Project 3 – Enhancement of Locally Managed Marine Areas					
		Project 4 – Rehabilitation and Regeneration of Coastal Ecosystems					
		Project 5 – Sustainable Fisheries Livelihoods Support					
		Project 6 – Infrastructure and Post Harvest Facilities Development for Municipal Fisheries					
		Project 7 – Fisheries Law Enforcement Enhancement					
		Project 8 – Rationalization of Municipal Fishing Effort					
Commercial Fisheries	Development and Management Program for Sustainable Commercial Fisheries	Project 1 – Rationalization of Fishing Effort in Overfished Commercial Fishing Areas					
		Project 2 – Development and Implementation of a Monitoring, Control and Surveillance (MCS) System for Commercial Fisheries					
		Project 3 – Development, Adaptation and Promotion of Selective, Environmentally-Friendly and Cost-Effective Fishing Gear and Practices					
		Project 4 – Exploratory Fishing in the EEZ and Beyond, and in Under-Exploited Commercial Fishing Grounds					
		Project 5 – Biology and Culture of the Pacific Bluefin Tuna ( <i>Thunnus orientalis</i> )					
Aquaculture	Increasing the Contribution of the Aquaculture Industry in National Development through the	Project 1 – Advocate a Focused, United and Strategic Vision and Road Map for the Industry					
		Project 2 – Enhance RD & E Programs and Prioritize according to Immediate Needs of Industry					
		Project 3 – Strengthen the Local Hatchery Industry					
		Project 4 – Developing Domestic Supply Chain and Expanding Export Markets for Aquaculture Products					

Sub-Sector	Program	Projects	Year				
			1 (2006)	2 (2007)	3 (2008)	4 (2009)	5 (2010)
	Adoption of	Project 5 – Institutionalize Best Aquaculture Practices (BAP)					
	Progressive and Economically Competitive Technology under a Framework of Social Equity and Environmental Sustainability	Project 6 – Establish Standards for Quality and Implement Farm-Based HACCP					
		Project 7 – Rationalize Policies on the Introduction of Live Aquatic Organisms					
		Project 8 – Promote Aquaculture Development through Special Economic Zones					
		Project 9 – Empower Small Holders and Fishers in Aquaculture					
Post Harvest		Project 1 – Strengthening of the Fish Inspection System in the Philippines					
		Project 2 – Development of National Quality Standards for Fish and Fishery Products					
		Project 3 – Marketing and Promotion of Philippine Fish and Other Aquatic Products					
		Project 4 – Development of New Value Added Fishery Products					
		Project 5 – Natural Marine Products					
		Project 6 – Reduction of Fisheries Post Harvest Losses					
		Project 7 – “Model Villages for Philippine Fisheries Post-Harvest”					
Institutional Development and Policy Support		Project 1 – Improving the Policy and Regulatory Framework for Fisheries					
		Project 2 – Building the Institutional Capacity of BFAR					
		Project 3 – Fisheries Management Capacity through Partnerships					
		Project 4 – Networks of Local Fisherfolk and Aquaculture Communities					
		Project 5 – Alliances for the Integrated Co-Management of Ecosystems					
		Project 6 – Upgrading Business Sector Capability					

### 5.3 Cost and financing

To fully meet the CNFIDP objectives, funding in the amount of PhP 1,638.13 million is needed to implement the projects under each sub-sector. Table 5.3a shows the estimated budget required for Fiscal Year (FY) 2006-2010. Aquaculture projects will entail costs up to PhP 701.5 million (43%), institutional projects are costed at PhP 476.78 million (29%), postharvest projects amounts to PhP 205.5 million (13%), commercial fisheries is estimated at PhP 200 million (12%), and municipal fisheries at PhP 54.35 million (3 percent). (Figure 5.3a) The CNFIDP as a whole will require a budget of PhP 324.1 million per year (Figure 5.3b)

Tables 5.3b-5.3f show the estimated project costs under each sub-sector. Sources of financing include government allocations, joint-implementation projects, grants from multilateral/bilateral sources and foundations, loans from the private and public sectors and public and private donations.

**Table 5.3a. Estimated Cost to Implement Sub-Sector Projects**

Sub-sector		Total Cost	Annual Cost
		(PhP million)	
1	Municipal Fisheries	54.35	18.12
2	Commercial Fisheries	200.00	40.00
3	Aquaculture	701.50	140.30
4	Post Harvest	205.50	41.10
5	Institutional	476.78	95.36
<b>Total</b>		<b>1,638.13</b>	<b>334.87</b>

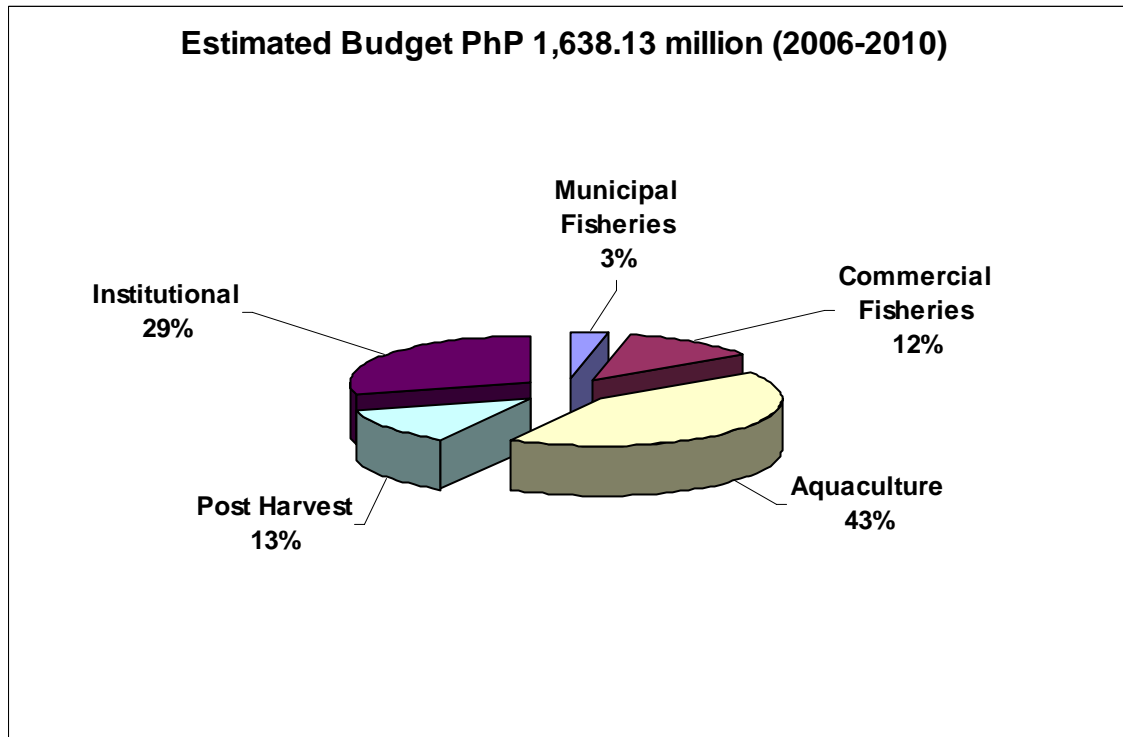


Figure 5.3a. Distribution of Cost by Sub-sector Program.

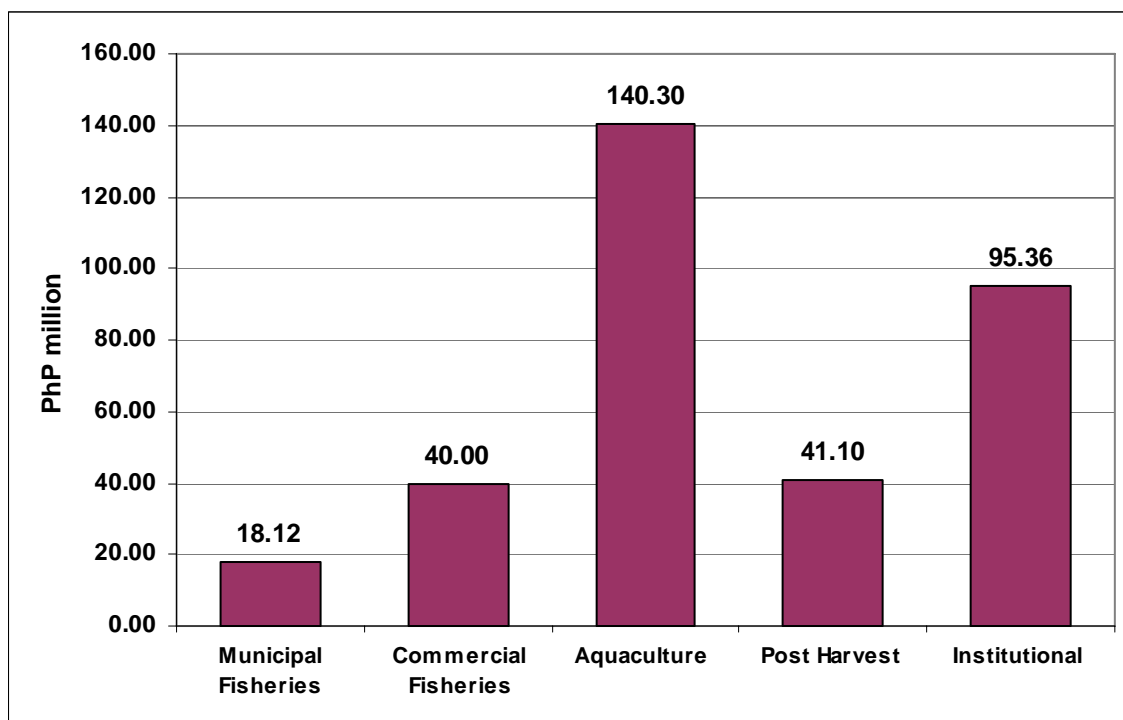


Figure 5.3b. Estimated Costs Per Year

**Table 5.3b. Estimated Costs for Projects Under Municipal Fisheries, (2006-2010)**

Project		Number of years	Total Cost (PhP million)
1	Comprehensive Education Program for FARMC Fisherfolk	5	6.60
2	Validation of Priority Use Rights through Municipal Registration and Licensing	5	5.00
3	Enhancement of Locally Managed Marine Areas	5	6.25
4	Rehabilitation and Regeneration of Coastal Ecosystems	5	4.50
5	Sustainable Fisheries Livelihoods Support	5	7.00
6	Infrastructure and Post Harvest Facilities Development for Municipal Fisheries	5	5.00
7	Fishery Law Enforcement Enhancement	5	5.00
8	Rationalization of Fishing Effort	5	15.00
<b>Total Program Cost</b>			<b>54.35</b>
<b>Annualized Program Cost</b>			<b>18.12</b>

**Table 5.3c. Estimated Costs for Projects Under Commercial Fisheries (2006-2010).**

Project		Number of years	Total Cost (PhP million)
1	Rationalization of Fishing Effort in Overfished Commercial Fishing Areas	5	25.00
2	Development and Implementation of a Monitoring, Control and Surveillance (MCS) System for Commercial Fisheries	5	50.00
3	Development, Adaptation and Promotion of Selective, Environmentally-friendly and Cost-effective Fishing Gear and Practices	5	20.00
4	Exploratory Fishing in the EEZ and Underexploited Commercial Fishing Grounds	5	85.00
5	Biology and Culture of Pacific Bluefin Tuna	5	20.00
<b>Total Program Cost</b>			<b>200.00</b>
<b>Annualized Program Cost</b>			<b>40.00</b>

**Table 5.3d. Estimated Costs for Projects Under (2005-2010)**

Project	Number of years	Total Cost (PhP million)
1 Advocate a Focused, United, and Strategic Vision and Road Map for the Industry	5	42.50
2 Enhance R&D programs	5	254.00
3 Strengthen Local Hatchery Industry	5	126.00
4 Develop Domestic Supply Chain and Expand Export Market	5	40.00
5 Institutionalize Best Aquaculture Practices	5	36.00
6 Establish standards for quality and implement farm-based HACCP	5	37.00
7 Rationalize policies on the introduction of live aquatic organisms	5	26.00
8 Promote aquaculture development through special economic zones	5	63.00
9 Empower small holders and fishers in aquaculture	5	77.00
<b>Total Program Cost</b>		<b>701.50</b>
<b>Annualized Program Cost</b>		<b>140.30</b>

**Table 5.3e. Estimated Costs of Projects Under Post Harvest (2006-2010).**

Project	Number of years	Total Cost (PhP million)
1 Strengthening Of The Fish Inspection System In The Philippines	5	30.00
2 Development Of National Quality Standards For Fish And Fishery Products	5	4.50
3 Marketing and Promotion of Philippine Fish and Other Aquatic Products	5	82.00
4 Development Of New Value Added Fishery Products	5	12.00
5 Natural Marine Products	5	12.00
6 Reduction of Post Harvest Losses	5	53.00
7 Model Villages for Philippine Post Harvest Fisheries	5	12.00
<b>Total Program Cost</b>		<b>205.50</b>
<b>Annualized Program Cost</b>		<b>41.10</b>

**Table 5.3f. Estimated Costs for Projects Under Institutional Sub-sector (2006-2010).**

Project	Start-up Cost	Annual Cost (year 2-5)	Total Cost
	(PhP million)		
1 Improving the Policy and Regulatory Framework	1.00	6.20	25.80
2 Building the Institutional Capacity of BFAR	11.90	22.00	99.90
3 Fisheries Management Capacity Through Partnerships	20.32	6.87	47.79
4 Network of Local Fisherfolk and Aquaculture Communities	3.03	23.92	98.71
5 Alliances for the Integrated Co-Management of Priority Fisheries Ecosystems	6.38	24.87	105.878
6 Improving Business Sector Capability	13.70	28.33	98.70
<b>Total</b>	<b>56.33</b>	<b>112.20</b>	<b>476.78</b>
		<b>Annualized</b>	<b>95.36</b>

## 5.4 Monitoring the Plan

The monitoring and evaluation (M & E) scheme for the CNFIDP represents a blueprint for monitoring projects implemented under each sub-sector. The M&E plan is based on the critical activities that will track progress and achievement of the CNFIDP is overall objectives. Such shall also guide decisions on municipal fisheries, commercial fisheries, aquaculture, postharvest and institutional projects that contribute to these objectives. Fisheries M&E goals include: (1) determining the progress towards fulfilling CNFIDP management direction for Philippine fisheries resources; and (2) determining effectiveness of fisheries and aquaculture management practices.

The heart of the M & E plan is a series of environmental and programmatic indicators that provide an effective mechanism for evaluating progress toward the full achievement of the CNFIDP goal. A group of eight primary indicators<sup>1</sup> that are easily communicated to the public have been selected to provide a broad basis for evaluating a range of CNFIDP actions (Table 5.4.a). The desired outcome and changes to be achieved by the projects are classified into three categories: (1) socio-economic and equity targets; (2) institutional/political targets; and (3) environmental/fisheries resource targets.

The M&E Plan for the CNFIDP will be a consequence of a 20-year process by which the partners<sup>2</sup> are expected to exchange information, characterize and assess the fishing industry at five-year milestone intervals.

<sup>1</sup> In addition, secondary indicators will be developed during the operational phase of the CNFIDP. These project-level indicators will provide an additional basis for evaluating the programmatic outputs and specific environmental outcomes of projects under each sub-sector.

<sup>2</sup> Including implementers of the CNFIDP and other stakeholder groups.

Table 5.4.a Performance Indicators for the Implementation of CNFIDP.

<b>Goal: To sustain the industry's socio-economic benefits without jeopardizing the fishery resources and the associated habitats in the most administratively efficient and cost-effective manner.</b>					
<b>Overall CNIDP Objectives</b>	<b>Indicator Description</b>			<b>Monitoring Mechanism</b>	<b>Assumptions</b>
	<b>Socio-economic and Equity Targets</b>	<b>Institutional/ Political Targets</b>	<b>Environmental/ Resource Targets</b>		
1. Rationalize the utilization of fishery resources	<ul style="list-style-type: none"> <li>Stable catch per unit effort. (Note: CPUE has declined from 10 kg in the 1970's to less than 2 kg this decade.)</li> <li>Increased earnings of commercial and municipal fishing.</li> </ul>	<ul style="list-style-type: none"> <li>Achieved consensus among key stakeholders on management system.</li> <li>Reduced resource competition.</li> <li>Resource rents established.</li> <li>Property/access rights delineated.</li> </ul>	<ul style="list-style-type: none"> <li>Optimized fishing yield as within maximum sustainable yield levels.</li> <li>Improved coastal fisheries resource in terms of growth parameters, recruitment patterns, mortality and exploitation parameters, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Catch and effort statistics (B FAR, BAS, etc.).</li> <li>Technical reports.</li> </ul>	<ul style="list-style-type: none"> <li>Adequate support from national/ partner institutions.</li> <li>Availability of fisheries data and related documentation.</li> <li>Cooperation of fisherfolk.</li> </ul>
2. Protect fishery habitats	<ul style="list-style-type: none"> <li>Cost savings in terms of fiscal and private sector abatement expenditures.</li> <li>Avoided income losses due to habitat damage.</li> </ul>	<ul style="list-style-type: none"> <li>Increased awareness/ perceptions of fisheries resource users and stakeholders on fisheries resource/yield trends and habitat linkages.</li> <li>Eliminate illegal and destructive fishing methods through enhanced compliance of regulations.</li> </ul>	<ul style="list-style-type: none"> <li>Improved management rating of MPAs.</li> <li>Improved coral reef and mangrove characteristics and status.</li> <li>Improved water quality and reduced pollution.</li> </ul>	<ul style="list-style-type: none"> <li>MPA annual monitoring reports.</li> <li>Coastal habitat assessment reports.</li> <li>Water quality monitoring reports.</li> </ul>	<ul style="list-style-type: none"> <li>Adequate support from national/ partner institutions.</li> </ul>

<b>Goal: To sustain the industry's socio-economic benefits without jeopardizing the fishery resources and the associated habitats in the most administratively efficient and cost-effective manner.</b>					
<b>Overall CNIDP Objectives</b>	<b>Indicator Description</b>			<b>Monitoring Mechanism</b>	<b>Assumptions</b>
	<b>Socio-economic and Equity Targets</b>	<b>Institutional/ Political Targets</b>	<b>Environmental/ Resource Targets</b>		
3. Reduce resource use competition		<ul style="list-style-type: none"> <li>• Cost savings in terms of fiscal and private sector abatement expenditures.</li> <li>• Avoided income losses due to habitat damage.</li> </ul>		<ul style="list-style-type: none"> <li>• Monitoring reports.</li> </ul>	
4. Maximize full potential of aquaculture and commercial fishing	<ul style="list-style-type: none"> <li>• Raised per capita income to at least PhP 15,000.</li> <li>• Raised yields of high value fish in terms of production volume per ha.</li> <li>• Increased contribution of fisheries sector in terms of GDP (3%, 2000) and GVA (15%, 2000).</li> <li>• Increased export volume and value of aquaculture products.</li> <li>• Number of municipalities with mariculture livelihood parks (MLPs) increased</li> <li>• More studies in EEZ and offshore waters</li> </ul>	<ul style="list-style-type: none"> <li>• Institutionalize best aquaculture practices.</li> <li>• Implementation of FAO and ASEAN-SEAFDEC code of conduct for responsible aquaculture.</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient utilization of coastal and marine resources.</li> <li>• Reduced environmental stress and risks.</li> </ul>	<ul style="list-style-type: none"> <li>• Project progress reports.</li> <li>• Trade and industry reports.</li> <li>• BFAR/DA reports.</li> </ul>	<ul style="list-style-type: none"> <li>• Recommended best aquaculture practices are used.</li> <li>• Adequate inputs and extension coverage is available.</li> <li>• Prices of aquaculture products are stable and do not fall.</li> <li>• Credit/micro-financing is available.</li> <li>• No natural disasters.</li> </ul>

<b>Goal: To sustain the industry's socio-economic benefits without jeopardizing the fishery resources and the associated habitats in the most administratively efficient and cost-effective manner.</b>					
<b>Overall CNIDP Objectives</b>	<b>Indicator Description</b>			<b>Monitoring Mechanism</b>	<b>Assumptions</b>
	<b>Socio-economic and Equity Targets</b>	<b>Institutional/ Political Targets</b>	<b>Environmental/ Resource Targets</b>		
	undertaken.				
5. Promote competitiveness of fishery products	<ul style="list-style-type: none"> <li>Increased occupational mobility and livelihood options.</li> <li>Reduced importation of fish products.</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate disincentives for importers of fish products.</li> <li>Appropriate incentives for local entrepreneurs/fishers/traders in place.</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate the use of unsustainable fishing and aquaculture practices.</li> </ul>	<ul style="list-style-type: none"> <li>Trade and industry reports.</li> <li>BFAR/DA reports</li> </ul>	<ul style="list-style-type: none"> <li>Local and export demand continues to expand.</li> <li>Minimal trade barriers.</li> </ul>
6. Minimize Post harvest losses	<ul style="list-style-type: none"> <li>Increased occupational mobility and livelihood options.</li> <li>Value added in fisheries products.</li> <li>Reduced human health risks due to consumption of unsafe fisheries products.</li> </ul>	<ul style="list-style-type: none"> <li>National and local policies on product quality and safety established.</li> <li>Increased physical construction of post harvest facilities.</li> <li>Improved fish marketing and distribution support.</li> </ul>	<ul style="list-style-type: none"> <li>Improved catch in terms of composition and fish size.</li> </ul>	<ul style="list-style-type: none"> <li>Quality inspection reports.</li> <li>Catch and effort statistics (B FAR, BAS, etc.).</li> </ul>	<ul style="list-style-type: none"> <li>Postharvest-related infrastructure are well managed and maintained.</li> </ul>
7. Enhance capability of LGUs, NGAs and local communities	<ul style="list-style-type: none"> <li>Increased participation and inclusion of vulnerable groups in spatial and resource use.</li> </ul>	<ul style="list-style-type: none"> <li>Institutional arrangements for fisheries management established.</li> <li>Achieved collaborative management and research activities.</li> <li>Achieved public-private</li> </ul>	<ul style="list-style-type: none"> <li>Improved coral reef and mangrove characteristics and status.</li> <li>Increased fisheries stock.</li> </ul>	<ul style="list-style-type: none"> <li>Consultative workshop reports.</li> </ul>	<ul style="list-style-type: none"> <li>Communities are adequately involved in planning and management of fisheries resources.</li> <li>NGOs are effective.</li> <li>Counterpart funds</li> </ul>

<b>Goal: To sustain the industry’s socio-economic benefits without jeopardizing the fishery resources and the associated habitats in the most administratively efficient and cost-effective manner.</b>					
<b>Overall CNIDP Objectives</b>	<b>Indicator Description</b>			<b>Monitoring Mechanism</b>	<b>Assumptions</b>
	<b>Socio-economic and Equity Targets</b>	<b>Institutional/ Political Targets</b>	<b>Environmental/ Resource Targets</b>		
		partnership.			are available.
8. Promote appropriate fisheries policies	<ul style="list-style-type: none"> <li>• Reduced resource use conflicts.</li> </ul>	<ul style="list-style-type: none"> <li>• Enforced fisheries laws regulations.</li> </ul>	<ul style="list-style-type: none"> <li>• Improved coral reef and mangrove characteristics and status.</li> <li>• Increased fisheries stock.</li> </ul>	<ul style="list-style-type: none"> <li>• BFAR/DA reports.</li> </ul>	<ul style="list-style-type: none"> <li>• Consensus among stakeholders is achieved in the development of fisheries policies.</li> </ul>
9. Strengthen institutional partnership	<ul style="list-style-type: none"> <li>• Increased active participation of stakeholders in the implementation of fisheries projects.</li> <li>• Increased investment of private sector in fisheries projects (e.g., R&amp;D) and other support activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Improved skills and capability of fisherfolk and coastal population.</li> </ul>		<ul style="list-style-type: none"> <li>• BFAR/DA reports.</li> </ul>	<ul style="list-style-type: none"> <li>• LGUs work well effectively together with NGOs, private sector, etc.</li> </ul>

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## APPENDIX

**Appendix Table 1 Socio-economic characteristics of fishing households, 2000.**

Household Characteristic	Heads are Fishermen (%)	Heads are in the Fishing Industry (%)	All Households
Distribution of Households by Educational Attainment of the Head			
No Grade Completed	6.5	4.3	4.1
Elementary Undergraduate	76.4	77.9	53.3
Elementary Graduate	12.3	12.7	20.3
1st-3rd Year High School	3.4	3.6	10.6
High School Graduate	0.3	0.3	1.2
College Undergraduate	0.2	0.1	0.7
At least College Graduate	0.9	1.2	9.8
Access to Safe Water	61.8	65.8	78.5
Access to Sanitary Toilet Facility	51.5	54.2	82.5
Access to Electricity	51.2	55.5	75.4
Proportion Living in Makeshift Houses	2.8	2.7	2.0
Proportion who are squatting	5.9	6.1	3.1
Mean Family Size	5.6	5.6	5.1
Mean Income	70,244	72,959	144,039
Mean Expenditure	62,445	64,297	118,002
Expenditure Pattern			
Total Household Expenditure	100.0	100.0	100.0
Food	59.3	58.5	43.6
Alcoholic Beverages	1.2	1.3	0.7
Tobacco	2.4	2.4	1.1
Fuel, Light and Water	5.9	6.0	6.3
Transportation and Communication	3.2	3.4	6.8
Household Operations	18.4	18.4	23.2
Personal Care and Effects	3.5	3.5	3.6
Clothing, Footwear and other Wear	2.4	2.4	2.7
Education	2.3	2.3	4.2
Recreation	0.2	0.3	0.5
Medical Care	1.2	1.3	1.9
Non-Durable Furnishings	0.3	0.3	0.2
Durable Furniture and Equipment	1.4	1.5	2.5
Taxes	0.4	0.4	2.1
House Rent	7.9	7.8	14.2

<b>Household Characteristic</b>	<b>Heads are Fishermen (%)</b>	<b>Heads are in the Fishing Industry (%)</b>	<b>All Households</b>
House Maintenance and Minor Repairs	0.9	0.9	0.9
Special Family Occasions	1.7	2.0	2.4
Gifts and Contributions to Others	0.9	0.8	0.9
Other Expenditures	2.9	2.9	2.9

(Source: ArcDev, 2004)

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